(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

#### 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  $y'' - 6y' + 9y = \frac{e^{3x}}{r^2}$ .

- 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  $f(x,y) = x^4 + y^4 - 2x^2 + 4xy - 2y^2$ 

- 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 ay<sup>2</sup> = x<sup>3</sup>
- 5. a) Find the Laplace transform of (i)  $e^{4t} \sin 2t \cosh(1-e^{t})/t$ .
  - 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.

8.

- a) Transform the integral  $\int_{0}^{\infty} \int_{0}^{\infty} e^{-1(x^2+y^2)} dx dy$  to polar coordinates and hence evaluate.
  - b) Change the order of integration  $\int_{0}^{1} \int_{x^2}^{2-x} xy \, dx \, dy$  and hence evaluate the same.
- 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.

Max. Marks: 70

SVEC-10

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(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

7

#### **Answer One Question from each Unit** All questions carry equal marks

### UNIT-I

- Explain absorption process, spontaneous and stimulated emission and derive 1 6 Marks a) Einstein's coefficients.
  - Explain construction and working of a He-Ne Laser with the help of energy level b) 8 Marks diagram. Mention few applications of Lasers in engineering field.

#### (**OR**)

- Discuss the construction and reconstruction of a Hologram. 2 a)
  - What are different types of Optical Fibers? Classify them based on modes of 8 Marks b) propagation and index profile. Mention few industrial and medical applications of Optical Fibers.

#### UNIT-II

a)	Explain the construction of Hologram.	6 Marks
b)	Describe the acceptance cone and numerical aperture.	8 Marks
a) b)	Derive the Separation between Successive (hkl) Planes. Explain Laue Diffraction of crystals with diagram	6 Marks 8 Marks
b)	Explain Laue Diffraction of crystals with diagram.	8]
	a) b) a) b)	<ul> <li>a) Explain the construction of Hologram.</li> <li>b) Describe the acceptance cone and numerical aperture.</li> <li>a) Derive the Separation between Successive (hkl) Planes.</li> <li>b) Explain Laue Diffraction of crystals with diagram.</li> </ul>

### (UNIT-III)

- 5 Why is the wave nature of matter not apparent in our daily observations? Explain 4 Marks a) it with suitable example.
  - What is the importance of Schrodinger's wave equation? Derive an expression for 10 Marks b) the wave function and energy of a particle confined in a one dimensional potential box.

#### (**OR**)

What is effective mass? Derive an expression for effective mass of an electron. 9 Marks 6 a) Explain origin of energy band formation in solids. 5 Marks b)

### UNIT-IV)

- Derive Clausius Mossotti Equation in dielectrics subjected to static fields. 8 Marks a)
  - Describe frequency and temperature dependence of polarization in dielectric 6 Marks b) medium.

#### (**OR**)

Derive an expression for intrinsic carrier concentration. 7 Marks 8 a) Explain qualitatively the working of a PN Junction Diode using energy level 7 Marks b) diagram.

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6 Marks

Max. Marks: 70

## 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

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(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 **Answer One Question from each Unit** All questions carry equal marks UNIT-I 1 a) Write a note on electrical insulators. 7 Marks 7 Marks Define the terms: b) i) Dielectric constant. ii) Dielectric loss. iii) Dielectric strength. (**OR**) 2 What are conducting polymers? How they are classified? Write important 7 Marks a) (**OR**) Discuss the estimation of hardness by EDTA method. 7 Marks a) Discuss desalination of brackish water by reverse osmosis method. 7 Marks b) UNIT-III) Define corrosion. Discuss concentration cell corrosion. 7 Marks 6 a) Compare H<sub>2</sub>-O<sub>2</sub> fuel cell with traditional cells. 7 Marks b) UNIT-IV 7 Explain mechanism of lubrication using boundary film lubrication. 7 Marks a) Describe various steps involved in refining of petroleum. 7 Marks b) (**OR**) How do you measure viscosity using Redwood viscometer? 8 a) 8 Marks Explain how refining of petroleum is carried out. b) UNIT-V What is meant by nano materials? Explain some of its properties. 7 Marks 9 a) How nano materials are synthesized? Explain aSol-Gel process. b) 7 Marks (**OR**) Write about any two methods for synthesis of nano materials. 7 Marks **10** a)

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Max. Marks: 70

	b)	applications of conducting polymers. 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

4

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)	
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6 Marks

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#### 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

7 Marks 1 Solve:  $xy(1 + xy^2)\frac{dy}{dx} = 1$ . b) Solve:  $(D^2 + 4)y = \tan 2x$  by the method of variation of parameters. 7 Marks (**OR**) A body of temperature 80°F is placed in a room of constant temperature 50°F at 2 a) 7 Marks a time t = 0. At the end of 5 minutes the body has cooled to a temperature of  $70^{\circ}$ F. When will the temperature of the body by  $60^{\circ}$ F. Solve:  $y'' + 2y' + 3y = e^x \cos x$ 7 Marks b) (UNIT-II) If  $u = \sin^{-1}\left(\frac{x}{y}\right) + \tan^{-1}\left(\frac{y}{x}\right)$ , show that  $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = 0$ 3 a) 7 Marks 7 Marks Determine the point where the function  $u = x^2 + xy + 3x + 2y + 5$  has a maxima b) or minima. (**OR**) 7 Marks 4 Sketch the curve for the equation  $r = a \sin^3 \theta$ . a) 7 Marks b) Find the radius of curvature at the point (r,  $\theta$ ) of the cardioids  $r = a (1 - \cos \theta)$ . (UNIT-III) Find the volume when the loop of the curve  $y^2 = x(2x - 1)^2$  revolves about the 5 7 Marks a) x-axis. Evaluate the following by changing into polar coordinates 7 Marks b)  $\int_{0}^{4} \int_{0}^{\sqrt{16-y^2}} y^2 \sqrt{x^2 + y^2} \, dx \, dy$ (OR) 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 6 a) Evaluate  $\iiint_V (x + y + z) dx dy dz$  where V volume of the cylinder  $x^2 + y^2 = 1$ , z = 0 and 7 Marks b) z = 4 by transforming into cylindrical coordinates. (UNIT-IV) Find the Laplace transform of (i)  $\cos^3 4t$  (ii)  $e^{-3t} t^2 . \sin(t)$ . 7 7 Marks a) Solve  $y'' + 2y' + y = 3x \cdot e^{-x}$  given y(0)=4, y'(0)=0. 7 Marks b) (**OR**) 8 7 Marks a) Find the inverse Laplace transform of (i)  $\cot^{-1}(s)$  (ii)  $\frac{s}{(s^2 + 9)^2}$ .

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

### UNIT-V

- Show that the vector field  $\overline{F} = (x^2 + xy^2)\vec{i} + (y^2 + x^2y)\vec{j}$  is irrotational and find 9 7 Marks a) a scalar potential  $\varphi$  such that  $\overline{F} = \nabla \phi$ 
  - Verify Green's Theorem for  $\oint_c (xy + y^2) dx + x^2 dy$ , where C is bounded by 7 Marks b) y = x and  $y = x^2$ .

- (OR) A vector field is given by  $F = (x^2 y^2 + x)\overline{i} (2xy + y)\overline{j}$ . Show that the field F is **10** a) 7 Marks irrotational and find its scalar potential.
  - If  $\overline{F} = 3x^2yz^2\overline{i} + x^3z^3\overline{j} + 2x^3yz\overline{k}$ , then show that  $\int_C \overline{F}.d\overline{r}$  is independent of the path of 7 Marks b) integration. Hence evaluate the integral where C is any path joining (0, 0, 0) to (1, 2, 3).

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Max. Marks: 70

### Roll No.

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

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

#### **MATHEMATICAL METHODS**

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

Time: 3 hours

Answer One Question from each Unit

All questions carry equal marks

### 

1	a)	Determine the non-singular matrices P and Q such that PAQ is in the normal	7 Marks
		torm for A, and hence obtain the rank of the matrix $A = \begin{bmatrix} 2 & -2 & 1 & 3 \\ 2 & 0 & 4 & 1 \end{bmatrix}$ .	
	h)	Solve the following system of equations by Gauss-elimination method:	7 Marks
	0)	2x + 4y + z = 3: $3x + 2y - 2z = -2$ : $x - y + z = 6$ .	
		(OR)	
2	a)	$\begin{bmatrix} 2 & 1 & 1 \end{bmatrix}$	7 Marks
		Verify Cayley-Hamilton theorem for $A = \begin{bmatrix} 0 & 1 & 0 \\ 1 & 1 & 2 \end{bmatrix}$ . Hence find A <sup>-1</sup> .	
	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 $r^3 - 3r - 5 = 0$ using Newton-	7 Marks
-	)	Raphson method and correct to four decimal places.	
	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	
	1-)	f(x): 2.7  6.4  12.5  21.6  34.3  51.2  72.9	7 \ ( 1
	D)	Denne forward, backward, central difference operators	/ Marks
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	7 Marks
		Modified Euler's method.	
	b)	A rod is rotating in a plane. The following table gives angle $\theta$ (in radians)	7 Marks
		through which the:	
		rod has turned for various values of time t (in seconds).	
		$\begin{array}{cccccccccccccccccccccccccccccccccccc$	
		$\forall$ 0 0.12 0.49 1.12 2.02 3.2 4.6/	
		Estimate angular velocity and angular acceleration of the rod at $t = 0.2$ , 1.0 sec.	

(OR)

A rod is rotating in a plane. The following table gives angle  $\theta$  (in radians) 6 14 Marks through which the: rod has turned for various values of time t (in seconds). t : 0.2 0.4 0 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 Marks 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  $f(x) = \frac{1}{x(1+x^2)}$ . (**OR**) 8 a) Find  $Z^{-1}(\frac{3z^2+z}{(5z-1)(5z+2)})$ . 7 Marks Obtain the Half Range Sine series for f(x) = ax + b, in (0,1). 7 Marks b) UNIT-V 9 7 Marks a) Form the partial differential equation for  $z = y^2 + 2f\left(\frac{1}{x} + \log y\right)$ . Solve by the method of separation of variables  $3\frac{\partial u}{\partial x} + 2\frac{\partial u}{\partial v} = 0$ 7 Marks b) with  $u(x,0) = 4e^{-x}$ (**OR**)

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

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Roll No.

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

#### I B.Tech (SVEC14) Supplementary Examinations August - 2021

### **ENGINEERING MECHANICS**

[Civil Engineering, Mechanical Engineering]

Time: 3 hours

2

a)

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 14 Marks 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.



(**OR**)

4 Marks

4 Marks

State laws of dry friction. A screw jack has square threads of mean diameter 6cm, helix angle 10<sup>o</sup> and 10 Marks b) coefficient of friction 0.3. Determine the force that must be applied to the end of 60cm lever to raise a weight of 3000N.

### UNIT-II

3 Differentiate between a roller support and a hinged support. 4 Marks a) A simply supported beam AB is subjected to a distributed load increasing from 10 Marks b) 1600 N/m to 4600 N/m from end A to end B respectively. The span AB = 6.5meters. Determine the reactions at the supports.

#### (**OR**)

- State the difference between a perfect frame and an imperfect frame. 4 a)
  - A truss of span 9m is loaded as shown in figure. Find the forces in the members 10 Marks b) marked as 1, 2 and 3, by method of sections.



### UNIT-III)

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

#### (OR)

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

### UNIT-IV

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

#### (OR)

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

### UNIT-V

9 A cylinder, a circular hoop and a sphere each having mass M and radius R are 14 Marks 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.

#### (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 10 Marks 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<sup>2</sup>.

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4 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** 

		Computer Science and Systems Engineering J	
Time: 3 hours Max. Marks		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 ba	nd 6 Marks
		theory.	
	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	9 Marks
		expressions and deduce Einstein's relations.	
	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	8 Marks
		expression for the electron concentration in intrinsic semiconductor.	
		UNIT-V	
9	a)	Distinguish between soft and hard magnetic materials.	6 Marks
	b)	Explain the origin of magnetic moment.	8 Marks

**10** a) Describe the BCS theory of superconductivity.

10 Marks

b) Mention any four applications of super conductivity.

4 Marks

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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** 

**Answer One Question from each Unit** All questions carry equal marks UNIT-I Solve:  $xy(1 + xy^2)\frac{dy}{dx} = 1$ . 7 Marks 1 a) b) Solve:  $(D^2 + 4)y = \tan 2x$  by the method of variation of parameters. 7 Marks (**OR**) a) Solve  $y'' + 4y' + 3y = e^{-x} \cdot sin(x) + x \cdot e^{3x}$ . 2 7 Marks Solve  $y''+-3y'+2y=(1+e^{-x})^{-1}$ , using the method of variation of parameters. b) 7 Marks UNIT-II 3 7 Marks a) Express equation  $\frac{\partial^2 y}{\partial x^2} + \frac{\partial^2 y}{\partial y^2} = 0$  in polar form (r,  $\theta$ ). Show that the rectangular solid of maximum volume that can be inscribed in a b) 7 Marks sphere is cube. (**OR**) Trace the curve  $a^2y^2 = x^2(a^2 - x^2)$ 4 7 Marks a) Find the radius of curvature at any point of the cardioid  $r = a(1 - \cos\theta)$ . 7 Marks b)

### UNIT-III)

- Find the length of the arc of the parabola  $x^2=4ay$  measured from the vertex to one 5 7 Marks a) extremity of the latus rectum.
  - Find the surface of the solid formed by revolving the cardioids  $r = a(1+cos(\theta))$ b) 7 Marks about the initial line.

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

#### UNIT-IV

- Find the Laplace transform of (i)  $\cos^3 4t$  (ii)  $e^{-3t} \cdot t^2 \cdot sin(t)$ . 7 a) 7 Marks b)
  - Solve  $y'' + 2y' + y = 3x \cdot e^{-x}$  given y(0)=4, y'(0)=0. 7 Marks (**OR**)
  - 7 Marks a) Find the inverse Laplace transform of (i)  $\cot^{-1}(s)$  (ii)  $\frac{s}{(s^2 + 9)^2}$
  - Solve y''-  $3y'+2y = 4t+e^{3t}$  given y(0)=1, y'(0)=-1, using Laplace transform. b) 7 Marks

Max. Marks: 70

Time: 3 hours

6

8

a)

### UNIT-V

- Show that the vector field  $\overline{F} = (x^2 + xy^2)\vec{i} + (y^2 + x^2y)\vec{j}$  is irrotational and find 9 7 Marks a) a scalar potential  $\varphi$  such that  $\overline{F} = \nabla \phi$ 
  - Verify Green's Theorem for  $\oint_c (xy + y^2) dx + x^2 dy$ , where C is bounded by 7 Marks b) y = x and  $y = x^2$ .

#### (OR)

- Use Gauss divergence theorem to evaluate  $\iint_{S} \overline{A} \cdot d\overline{S}$  where  $A = x^{3}\overline{i} + y^{3}\overline{j} + z^{3}\overline{k}$ and S is the surface of the sphere  $x^{2} + y^{2} + z^{2} = a^{2}$ . 7 Marks **10** a)
  - A vector field is given by  $F = (x^2 y^2 + x)\overline{i} (2xy + y)\overline{j}$ . Show that the field F 7 Marks b) is irrotational and find its scalar potential.

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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 $2x + 3ky + (3k + 4)z = 0$ ;	7 Marks
		x + (k+4)y + (4k+2)z = 0; $x + 2(k+1)y + (3k+4)z = 0$ for all values of k	
	b)	$\begin{bmatrix} 2 & 1 & -1 \end{bmatrix}$	7 Marks
		Using Cayley Hamilton theorem find $A^{-1}$ where $A = \begin{bmatrix} 0 & 2 & 1 \end{bmatrix}$	
		5 2 - 3	
		(OR)	
2	a)		7 Marks
		Find the eigen values and eigen vectors of the matrix $\begin{bmatrix} 1 & 2 & 2 \end{bmatrix}$	
		The die eigen values and eigen vectors of the matrix $\begin{bmatrix} 1 & 2 & 2 \\ -1 & -1 & 0 \end{bmatrix}$	
	1 \		7 ) ( 1
	b)	Reduce the quadratic form $7x^2 + 6y^2 + 5z - 4xy - 4yz$ to the canonical form	/ Marks
		and find its rank, index and signature.	
		(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	
4	a)	(OR)	7 Martra
4	a)	Find a real root of the equation $x \log_{10} x = 1.2$ lying between 2 and 3 by Regula-	/ WIAIKS
	h)	Find the positive root of $\frac{4}{10}$ 10 correct to three desired places, using	7 Marks
	0)	Find the positive foot of $x - x = 10$ confect to three declinar places, using Newton Dephase method	
_			
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:	/ 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	7 Marks
		method. Also, compare the result with its exact value.	
		(OR)	
6	a)	Find the first and second derivatives of the function tabulated below at the point	7 Marks
		$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	
	b)	<u>y J U J U.120 J U.344 J 1.290 J 2.432 J 4.000</u> Use fourth order Runge-Kutta method to find	7 Marka
	U	Use rearrant of the realized realized in the first of the first state	/ 1VIAINS

y at x = 0.1, given that  $dy / dx = 3e^{x} + 2y$ , y(0) = 0 and h = 0.1

**SVEC-14** 

### UNIT-IV

- Find the half-range Sine series for the function  $f(x) = x x^2$ , 0 < x < 1. Find  $Z^{-1}\left[\frac{z^2 3}{(z+2)(z^2+1)}\right]$ . 7 7 Marks a) b) 7 Marks
  - (OR)

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

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

- Find the partial differential equation of all spheres whose centers lie on the 9 5 Marks a) z-axis.
  - 9 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. (OR)
- 10 14 Marks An insulated rod of length has its ends A and B maintained at 0 C and 100 C respectively until steady state condition prevails. If B is suddenly reduced to 0 and maintained at 0 C. Find the temperature at a distance x from A at time t. ැබ (f) Ð

Time: 3 hours

### 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 ]

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	7 Marks
		array for any data type.	- > < 1
	b)	Define Recursion. Write a C program to print Fibonacci sequence using	7 Marks
		recursion.	
6	a)	(UK) Differentiate between call by value and call by reference with suitable program	7 Marks
0	a) b)	Demonstrate quick sort with a program	7 Marks
	0)	Demonstrate quiek soft with a program.	
		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
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#### I B.Tech (SVEC14) Supplementary Examinations February – 2021

#### **ENGINEERING MECHANICS**

#### [Civil Engineering, Mechanical Engineering]

Time: 3 hours

#### 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 State laws of dry friction. 4 Marks a)

- A screw jack has square threads of mean diameter 6cm, helix angle 10<sup>o</sup> and 10 Marks b) coefficient of friction 0.3. Determine the force that must be applied to the end of 60cm lever to raise a weight of 3000N.
  - UNIT-II
- 3 A simply supported beam AB of 7m span is subjected to (i) 4KN-m clockwise 14 Marks 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.

#### (**OR**)

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



#### UNIT-III)

5 Determine the Second moment area of an unsymmetrical I-section about two 14 Marks 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.

#### (**OR**)

State theorems of Pappus and hence find the total surface area of a frustum of a 14 Marks 6 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)

#### (UNIT-IV)

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

1

SVEC-14

Max. Marks: 70

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

### UNIT-V

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

#### (OR)

- **10** a) Derive the expressions for velocity and acceleration of a particle subjected to a 7 Marks force as a function of velocity.
  - b) Explain the equations of equilibrium of a rigid body experiencing a planar 7 Marks motion.

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SVEC-16 Roll No.

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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

3

Max. Marks: 70

#### **Answer One Ouestion from each Unit** All questions carry equal marks

### UNIT-I

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

#### (**OR**)

- Explain Nalgonda method used for Defluoridation of water and list out the 2 a) 7 Marks merits and demerits of various deflouridation methods.
  - What is the threshold level of fluoride in ground water? Discuss the adverse 7 Marks b) effects of fluorides on human health

UNIT-II

7 Marks

Discuss about: a) i) particulate composites. ii) layered composites. Give the potential applications of biodegradable polymers. 7 Marks **b**)

#### (**OR**)

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

### 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 14 Marks sensor.

#### (**OR**)

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

### UNIT-V

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

#### (**OR**)

- 10 a) Classify the lubricants based on their state. 7 Marks
  - Examine the influence of 'pH' and 'purity of metal' on the rate of corrosion. 7 Marks b)

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Roll No.

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### **ENGINEERING PHYSICS**

#### [Electrical and Electronics Engineering, Electronics and Communications Engineering, **Electronics and Instrumentation Engineering**

Time: 3 hours

# Answer One Question from each Unit

Max. Marks: 70

SVEC-16

# All questions carry equal marks

### UNIT-I

1	a) b)	Explain the characteristics of a laser. Distinguish spontaneous and stimulated emission of radiation. Define life time	6 Marks 8 Marks
	,	of an atom and metastable state.	
		(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
_			
5	a) b)	Classify different types of semiconductor. Derive an expression for intrinsic carrier concentration in an intrinsic semiconductor	4 Marks 10 Marks
		(OR)	
6	a)	What is intrinsic Semiconductor?	4 Marks
	b)	Derive the expression for electron concentration in an intrinsic semiconductor.	10 Marks
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.
  - b) Derive the expression for inter-planar distance between consecutive planes for a 10 Marks cubic system.

### (OR)

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

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4 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

### **Answer One Ouestion from each Unit**

All questions carry equal marks

### UNIT-I

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

#### (**OR**)

2 Define signature of quadratic 14 Marks rank, index, а 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.

### UNIT-II )

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

X	10	15	20	25	30	35
У	35.3	32.4	29.2	26.1	23.2	20.5

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

X	0	2	4
У	5.1	10	31.1
		(OR)	

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

Х	0	5	10	15	20	25
У	12	15	17	22	24	30

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

x	77	100	185	239	285			
у	2.4	3.4	7.0	11.1	19.6			
(UNIT-III)								

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

$x^{0}$	10	20	30	40	50	60	70	80
Cosx	0.984	0.939	0.866	0.766	0.642	0.500	0.342	0.173
	8	/	U	U	8	U	U	/

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



Max. Marks: 70

SVEC-16

6 a)

b)

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 7 Marks of f(42) from the following data.

x	20	25	30	35	40	45
f(x)	354	332	291	260	231	204
		(L	JNIT-	IV)		

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

X	1.5	2.0	2.5	3.0	3.5	4.0
у	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 7 Marks of 5 seconds. Obtain the initial acceleration using the data.

	Time(t sec)	0	5	10	15	20	
	Velocity v(m/sec)	0	3	14	69	228	
6							7 Marks
Evaluate $\int x \sec \theta$	c xdx taking eight su	b int	erval	s by T	rapez	oidal ru	le.
0	_			_			
		UN:	IT-\				

- 9 a) Calculate y(0.3) from  $y' = x^2 + y^2$ , y(0) = 1 by apply Milne's Predictor- 7 Marks Corrector method. Take the straight values y(-0.1) = 0.9087, y(0.1)=1.1113, y(0.2)=1.2506.
  - 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, 7 Marks y(1.2) = 1.548, y(1.3)=1.974. Estimate y(1.4) using Milne's Predictor Corrector method.
  - 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.

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Max. Marks: 70

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

MULTI-VARIABLE CALCULUS AND DIFFERENTIAL EQUATIONS [Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours

4

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 7 Marks curves  $a y^2 = x^3$  where a is the parameter.
  - b) Check whether the two families of curves given by  $x^2 y^2 = a^2$  and 7 Marks  $x y = c^2$  are mutually orthogonal to each other or not and justify your answer.

#### (**OR**)

- 2 a) Design a mathematical equation for the orthogonal trajectories of the family of 7 Marks curves  $r = 2a (\cos \theta + \sin \theta)$ .
  - b) If the temperature of the body is changing from 100°C to 70°C in 15 minutes 7 Marks estimate the time for which the body comes to 40°C, the temperature of air being 30°C.

### UNIT-II

- 3 a) A circuit has in series on electromotive force given by  $E = 100 (\sin 40t)$  volts. A 7 Marks resistor of 10 $\Omega$  and an inductor of 0.5 H. If the initial current is 0 find the current at time t > 0.
  - b) A conductor of capacity C discharged through an inductance L and resistance R 7 Marks 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 = 250 $\Omega$  C = 2 x 10<sup>-6</sup> 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.

(OR)

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<sup>2</sup> < 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  $i = \frac{E}{R} \left[ \sin \omega t - \frac{1}{p\sqrt{LC}} e^{-\frac{Rt}{2L}} \sin pt \right]$ .

### UNIT-III

- 5 a) Examine the function for extreme values 7 Marks  $f(x, y) = x^4 + y^4 2x^2 + 4xy 2y^2$  (x>0, y>0).
  - b) Evaluate three positive numbers whose sum is 100 and whose product is 7 Marks maximum.

#### (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 7 Marks 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.

Change the order of integration, evaluate 
$$\int_{0}^{4a} \int_{x^2/4a}^{2\sqrt{ax}} dy dx$$

8

7

Evaluate  $\int_{0}^{1} \int_{x^2}^{2-x} xy dx dy$  by the change of order technique. 14 Marks

### UNIT-V

- 9 a) State Greens theorem in a place and verify it for  $\oint (3x^2 8y^2)dx + (4y 6xy)dy$  7 Marks where C is the region bounded by  $y = \sqrt{x}$  and  $y = x^2$ .
  - b) State stokes theorem and applying it evaluate  $\oint_C ydx + zdy + xdz$  where C is the Curve of intersection of the sphere  $\mathbf{x}^2 + \mathbf{y}^2 + \mathbf{z}^2 = \mathbf{a}^2$  and  $\mathbf{x} + \mathbf{z} = \mathbf{a}$ .

- 10 a) State stokes theorem and applying it show that curlgrad  $\phi = \overline{0}$ . 7 Marks
  - b) State Gauss divergence theorem and use it to evaluate 7 Marks  $\iint (yz^2\overline{i} + xz^2\overline{j} + 2z^2\overline{k}) \cdot d\overline{s}.$  where S is the closed surface bounded by xy - plane and the upper half of the sphere  $x^2 + y^2 + z^2 = a^2$  above this plane.

SVEC-16 Roll No.

### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

**ELECTRIC CIRCUITS** 

#### [Electrical and Electronics Engineering]

Time: 3 hours

Max. Marks: 70

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



- 1 a) State ohm's law and give its applicability to electrical network and explain 7 Marks convention current direction and voltage across an element
  - b) Find the total power dissipated in the circuit shown in the Fig. 1 (All resistances 7 Marks are in ohms).



- 2 a) What are passive and active elements? Explain the volt-current relationship of 7 Marks passive elements with examples.
  - b) Using Kirchoff's current law, find the values of the currents  $i_1$  and  $i_2$  in the 7 Marks circuit shown in Fig. 2.



3 a) Derive the expression of resonant frequency for RLC series circuit shown in Fig.3 6 Marks  $\frac{i\omega L}{\omega L}$ 



- b) For the circuit shown in Fig. 4 compute:
  - (i) Power factor. (ii) Average power delivered by the source.
    - (iii) Reactive power. (iv) Apparent power. (v) Complex power.



8 Marks



#### (OR)

- 4 a) A series RLC circuit consists of  $R=100\Omega$ , L = 0.02 H and C = 0.02 microfarad. 6 Marks 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.
  - b) For the circuit shown in Fig. 5, find the load impedance  $Z_L$  that absorbs the 8 Marks maximum average power. Calculate that maximum average power.



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

#### (OR)

- 6 a) State and explain Maximum power transfer theorem and derive the necessary 6 Marks conditions for maximum power transfer for a DC excitations.
  - 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 6 Marks load with neat sketch.
  - b) For the following Fig.6, the RMS value of the line voltage is 208 V. Find the 8 Marks average power delivered to the load.



- 8 a) Explain how a single wattmeter can be used to measure the reactive power with 6 Marks the help of circuit connection and derive the necessary equations.
  - b) The unbalanced  $\Delta$ -connected load of Fig.7 is supplied by balanced line-to-line 8 Marks voltage of 440V in the positive sequence. Find the line currents. Take  $V_{ab}$  as a reference.



### UNIT-V

- 9 a) Derive the expressions for equivalent inductance of two coils in parallel with 6 Marks i) parallel aiding. ii) parallel opposition.
  - b) Find the input impedance of the circuit in Fig. 8 and the current from the 8 Marks voltage source.



- 10 a) Derive the expressions for equivalent inductance of two coils in series with 6 Marks i) series aiding. ii) series opposition.
  - b) Calculate the mesh currents shown in Fig. 9

8 Marks



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(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### **PROGRAMMING IN C**

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

Time: 3 hours

Max. Marks: 70

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

### UNIT-I

1		Define C character set and explain about the C tokens and Data types with examples.	14 Marks
		(OR)	
2	a)	Illustrate the structure of 'C' Program with an example.	7 Marks
	b)	List various steps to develop Programs in 'C'.	7 Marks
		UNIT-II)	
3	a)	Demonstrate One way and Two way decision statements with example programs.	7 Marks
	b)	Write a 'C' Program that determines if a year is Leap Year (or) not. (OR)	7 Marks
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 <b>n</b> 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
7	a)	Define Pointer Data type. Write a 'C' Program using Pointers to exchange the contents of two variables	7 Marks
	h)	Write a short note on Pointer Operators	7 Marks
	0)	(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
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
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. $\circledast \ \circledast \ \circledast$	5 Marks

SVEC-16

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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

Answer One Question from each Unit All questions carry equal marks

#### UNIT-I

1 Explain the following. 7 Marks a) i) Priming. ii) Foaming. Write short note on internal treatment methods for softening of water. 7 Marks b) (**OR**) What is the principle of reverse osmosis? Explain the process of reverse 2 7 Marks a) osmosis "Reverse osmosis is advantageous over ion exchange process" justify the 7 Marks b) statement UNIT-II 3 a) Differentiate short and long fibre-reinforced composites 7 Marks What are the advantages of composite material? Mention its applications 7 Marks b) (**OR**) Write the synthesis, properties and applications of the following engineering 4 14 Marks plastics. i) Poly Carbonates. ii) Teflon. UNIT-III) Discuss any three tools of Green Chemistry with examples. 5 14 Marks (**OR**) 6 Write the twelve principles of Green Chemistry and evaluate their role on 14 Marks chemistry and environment. UNIT-IV) 7 Discuss the construction and working of Lithium-ion battery with the reactions 14 Marks occurring during charging and discharging. Mention the applications of Li-ion batteries. (**OR**) 8 Define fuel cell. Explain the construction, working of H<sub>2</sub>-O<sub>2</sub> fuel cell and its 14 Marks applications. UNIT-V 9 Define flash point and fire point of a lubricant and explain their significance. 7 Marks a) Illustrate semi-solid lubricants with their uses. 7 Marks b) (**OR**) 10 a) Write short note on: 7 Marks i) Cloud and pour points. ii) Mechanical strength of lubricants. Compare the terms viscosity and viscosity index 7 Marks b) (유) (유)

Max. Marks: 70

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### **ENGINEERING PHYSICS**

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

#### Time: 3 hours

3

8

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

Max. Marks: 70

### UNIT-I

- 1 a) Explain the construction and working of a semiconductor laser. Give the 10 Marks applications of semiconductor laser.
  - b) Calculate the wavelength of emitted radiation from GaAs which has a band gap 4 Marks of 1.44 Ev.

#### (OR)

- 2 a) What is an optical fiber? What is the principle involved in its working? Derive 10 Marks an expression for acceptance angle of an optical fiber and how it is related to numerical aperture.
  - b) The refractive indices of core and cladding materials of an optical fiber are 1.48 4 Marks and 1.45 respectively. Calculate numerical aperture and acceptance angle

### UNIT-II)

a) Explain origin of energy band formation in solids.
b) Distinguish between conductors, insulators and semiconductors based on band theory. An electron is bound in one dimensional infinite well of width 1 x 10<sup>-10</sup> m then find the energy values in the ground state and in the first two excited states.

#### (**OR**)

4 a) Explain de-Broglie hypothesis.
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 14 Marks band diagram.

### UNIT-IV

- 7 a) How the reverberation and reverberation time influences the acoustically good 6 Marks hall?
  - b) Distinguish between echo and reverberation. A hall with a volume of 1000m<sup>3</sup> 8 Marks has a sound absorbing surface of area of 400m<sup>2</sup>. If the average absorption coefficient of the hall is 0.2 sabine, what is the reverberation time of the hall?

#### (**OR**)

a) Elaborate Meissner's effect.
b) Distinguish between Type-I and Type-II superconductors.
7 Marks

### UNIT-V

4 Marks

- 9 a) How X-rays are suitable in determination of crystal structure.
  - b) State and explain Bragg's law for diffraction in crystals. Calculate the glancing 10 Marks 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.

#### (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 9 Marks deposition.

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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

14 Marks

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

1

(		UNI	<u>T-I</u> )
	8	- 8	- 2]
Construct the diagonal matrix A=	4	- 3	- 2
	3	- 4	1
		(OF	R)

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

$$P \text{ of } A = \begin{bmatrix} 2 & 1 & -6 \\ -1 & -2 & 0 \end{bmatrix}$$

### UNIT-II

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

					-		•
Х	1	2	3	4	5	6	7
У	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 7 Marks  $y = ae^{bx}$  that best fits the following data

Х	0	1	2	3			
Y	1.05	2.10	3.85	8.30			

(UK) 4 a) Construct a straight line by method of least square principle to the following data 7 Marks  $\begin{bmatrix} x & 1 & 2 & 3 & 4 & 5 \end{bmatrix}$ 

X	I	2	3	4	5
у	4	3	6	7	11

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

#### (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 7 Marks  $f(x) = \frac{3x^2 + x + 1}{(x - 1)(x - 2)(x - 3)}$  as a sum of partial fractions.

(OR)

SVEC-16

6 a) Define (i) Average operator (ii) Central difference operator and hence show that 7 Marks  $E^{\frac{1}{2}} = \mu + \delta$ 

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

b)

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

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	

7 a) A Slider in a machine moves along a fixed straight rod. Its distance x cm along 7 Marks 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.

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

7 Marks

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.

#### (OR)

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

b)  
Evaluate the following integral 
$$\int_{1}^{2} \frac{e^{x}}{x} dx$$
 using Simpson's  $\frac{1}{3}$  rd rule for  $n = 4$   
**UNIT-V**

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

#### (OR)

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

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 7 Marks series method.

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

MULTI-VARIABLE CALCULUS AND DIFFERENTIAL EQUATIONS [Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering, Computer Science and Engineering, Electronics and Instrumentation Engineering, Information Technology and Computer Science and Systems Engineering]

Time: 3 hours

Max. Marks: 70

7 Marks

#### 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 7 Marks reducing it into exact equation.
  - b) Find a solution for the differential equation  $(xy \sin xy + \cos xy) y dx + (xy \sin xy - \cos xy) x dy = 0$

#### (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 7 Marks differential equation  $2xy \, dy (x^2 + y^2 + 1) dx = 0$

### (UNIT-II)

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

b) Solve the equation 
$$\frac{d^2 y}{dx^2} - y = \frac{2}{1 + e^x}$$
 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 7 Marks partial fractions
  - b) An uncharged condenser of capacity C is charged by applying an e.m.f. 7 Marks  $E \sin(\frac{t}{\sqrt{LC}})$ , through leads of self-inductance L and negligible resistance. Show that at any time t, the charge on one of the plates is  $\frac{EC}{2} \left\{ \sin \frac{t}{LC} - \frac{t}{\sqrt{LC}} \cos \frac{t}{\sqrt{LC}} \right\}$  **UNIT-III**
- 5
  - a) Using the appropriate technique of finding stationary values, estimate the 7 Marks maximum and minimum values for the function  $x^3 + y^3 3axy$ 
    - b) Write the Taylor series for a function f(x,y) about a point (a,b) and hence 7 Marks expand the function  $x^3 + y^3 + xy^2$  in powers of (x-1) and (y-2).

(OR)

- 6 a) By the technique of finding stationary values for the function 5 Marks  $x^2y^2 5x^2 8xy 5y^2$ , decide at what points the function becomes maximum and minimum.
  - b) By the technique of Lagrange's undetermined multipliers establish a minimum 9 Marks value for  $x^2 + y^2 + z^2$  subject to the condition  $xyz = a^3$
# UNIT-IV

- 7 a) Evaluate  $\iint (x^2 + y^2) dx dy$  in the positive quadrant for which  $x + y \le 1$ . 7 Marks
  - b) Evaluate  $\iint (x + y) dx dy$  over the region of the positive quadrant bounded by the 7 Marks ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ .

#### (OR)

- 8 a) Evaluate the following integral by the technique of transforming into polar 7 Marks coordinates  $\int_{0}^{a} \int_{0}^{\sqrt{a^2-x^2}} y\sqrt{x^2+y^2} dx dy$ .
  - b) Evaluate  $\iint_{R} (1 \frac{x^2}{a^2} \frac{y^2}{b^2}) dx dy$  over the first quadrant of the ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$  7 Marks using the transformations x = au and y = bv.

## UNIT-V

- 9 a) Define flux of a vector point function across a surface and compute the flux of 6 Marks water through the parabolic cycloid  $y = x^2$ ,  $0 \le x \le 2$ ;  $0 \le z \le 3$ , if the velocity vector  $\overline{V} = 3z^2\overline{i} + 6\overline{j} + 6xz\overline{k}$  m/sec.
  - b) By transforming into triple integral evaluate  $\iint_{S} x^{3} dy dz + x^{2} y dz dx + x^{2} z dx dy$  8 Marks where S is the closed surface consisting of the cylinder  $\mathbf{x}^{2} + \mathbf{y}^{2} = \mathbf{a}^{2}$  and the circular discs z = 0 and z = b

#### (OR)

10 a) Define surface integral and evaluate  $\int_{S}^{1} \overline{F} \cdot \overline{n} dS$  where  $\overline{F} = z\overline{i} + x\overline{j} - 3y^2 z\overline{k}$  and 9 Marks

S is the surface  $x^2+y^2 = 16$  included in the first octant between z = 0 and z = 5. b)

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

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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 14 Marks non-verbal communication. **(OR)** 

# 2 Distinguish between Intrapersonal, Interpersonal and Organisational barriers to 14 Marks communication.

## UNIT-II)

3 Discuss the barriers which affect the process of listening and suggest methods to 14 Marks overcome the barriers.

#### (OR)

4 State the factors on which the listening modes depend and elaborate on different 14 Marks kinds of listening modes.

## 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	14 Marks
	help of suitable examples.	
	(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

1

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

UNIT-I

14 Marks

Max. Marks: 70



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



- 2 a) Explain the concept of dual and duality in electrical circuits.
  - b) Find the loop currents  $\mathbf{i}_1$ ,  $\mathbf{i}_2$  and  $\mathbf{i}_3$  in the network of Fig.2 by mesh method.



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



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





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

RCL series circuit shown in Fig. 5



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



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



- 6 State and explain compensation theorem. a)
  - 7 Marks Calculate the change in current of the network given below using compensation 7 Marks b) theorem when load resistor changes to  $10\Omega$ .



- 7 Explain how the power factor of a three phase load can be determined by two 6 Marks a) wattmeter method.
  - b) Find the line currents in the unbalanced three-phase circuit of Fig. 8 and the real 8 Marks power absorbed by the load.



7 Marks

- 8 Three identical coil having impedance of  $(17.32 + j10) \Omega$  each are connected in 14 Marks star across a 3-phase, 50 Hz, 400V supply. Find:
  - i) The total power supplied.
  - ii) Power factor of the load.

10

iii) If same coils are now connected in delta, calculate the total power taken by the load. Comment on result.

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





b) Determine the mesh currents  $I_1$  and  $I_2$  in the circuit of Fig. 10 5  $\Omega$   $_{j2}\Omega$  8 Marks



(OR)

a) Determine the voltage  $V_0$  in the circuit of Fig. 11  $j \mid \Omega$   $4 \Omega$  $V \stackrel{4 \Omega}{\longrightarrow} j \mid S \Omega \stackrel{4 \Omega}{\rightrightarrows} j \mid S \Omega \stackrel{4 \Omega}{n} j \mid S \Omega \stackrel{4 \Omega}{\rightrightarrows} j \mid S \Omega \stackrel{4 \Omega}$ 



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



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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

- Write short notes on source transformation. 1 a)
- 7 Marks Reduce the network to a single loop network by successive source 7 Marks b) transformation to obtain the current in the 12  $\Omega$ resistor shown in figure.



#### (**OR**)

- State ohm's law and give its applicability to electrical network and explain 2 a) 7 Marks convention current direction and voltage across an element.
  - Determine the equivalent resistance between the points **ab** in the circuit shown 7 Marks **b**) in figure.



- Explain the concept of active, reactive and apparent power and draw the power 3 7 Marks a) triangle.
  - In an AC circuit with 500sin100t as source voltage, connected across series 7 Marks **b**) combination of resistance and capacitance of  $10\Omega$  and 10F respectively. Calculate the source current flowing through the circuit. Also construct impedance and power triangles.

#### (**OR**)

- Define cut-off frequencies and bandwidth. Derive the expressions for cut-off 4 7 Marks a) frequencies and bandwidth of series RLC circuit.
  - Design the capacitance C, which results in resonance at 5000 rad/sec for the 7 Marks **b**) circuit shown in figure.



SVEC-16

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



 $2 \Omega$ 

7 Marks 7 Marks

7 Marks

7 Marks

1



 $2 \Omega$ 

7 a) Obtain the relation between hybrid and ABCD parameters.b) Find the y- Parameters for the circuit shown in the figure

5

30 \





- 8 a) Define reciprocity and symmetry for a generalized two port network and derive 7 Marks the conditions for reciprocity and symmetry in terms of ABCD parameters.
  - b) Z-parameters for a two port network are given as  $Z_{11}=25$ ,  $Z_{12}=Z_{21}=20$ ,  $Z_{22}=50$ . 7 Marks Design an equivalent T-network.

### 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 8 Marks 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.



10 A Series RLC circuit with  $R=100\Omega$ , L=0.1H and C=100µF has a DC voltage of 14 Marks 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.

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#### 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

2

8

9

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

#### Max. Marks: 70

# 

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

#### (OR)

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

7 Marks

7 Marks

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

#### (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 7 Marks starting and ending meter readings. The charges are as follows.
     No of Units Consumed rates in (Rs.) per unit

No. of Units	Consumed rates in (Rs.) p
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
7 Marks Functions.

#### (OR)

- 6 a) How 1-Dimesional and 2-Dimensional arrays will be Passed to functions? 7 Marks Explain with suitable examples.
  - b) Write a 'C' program to find Transpose of a Given Matrix using Functions. 7 Marks
- 7 Demonstrate Dynamic Memory Allocation functions with syntax. 14 Marks

#### (OR)

- a) What is Pointer to Pointer? Explain with example.
- 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)

# UNIT-V

a) What is the difference between sequential access and Random access of files?b) Using command line arguments, write a program to copy two files.7 Marks7 Marks

#### (OR)

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

SVEC-19

Max. Marks: 60

PO1

**PO2** 

# SREE VIDYANIKETHAN ENGINEERING COLLEGE

Roll No.

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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

Answer One Question from each Unit

## All questions carry equal marks

# UNIT-I

a) Solve the differential equation $\frac{d^2 y}{dx^2} + \frac{dy}{dx} + y = (1 - e^x)^2$ .	LS	COI	PO1 PO2
---	----	-----	------------

b) Solve the differential equation 
$$\frac{d^2y}{dx^2} - 2 \frac{dy}{dx} + y = xe^x \sin x$$
.  
(OR) 6 Marks L3 CO1 PO1 PO2

Using the method of variation of parameters, solve 2. a) 6 Marks L3 CO1 PO1 **PO2**  $y'' - 2y' + y = e^x \log x$ .

6 Marks L2 CO1 b) Change the differential equation  $x^2 \frac{d^2 y}{dx^2} - x \frac{dy}{dx} + y = \log x$  in to linear equation with constant coefficients and find its general solution.

# UNIT-II

- Construct the partial differential equation by eliminating arbitrary 3. a) 6 Marks L3 CO1 PO1 function f from the relation  $f(x^2 + y^2, z - xy) = 0$ .
  - Find the complete solution of the partial differential equation b) 6 Marks L1 CO1 PO1  $z^{2}(p^{2}+q^{2})=x^{2}+y^{2}$ . PO<sub>2</sub>

Solve the partial differential equation  $r - 4s + 4t = e^{2x+y}$ . L3 CO1 PO1 4. 6 Marks a) **PO2** Applying the method of separation of variables to solve b) L3 PO1 6 Marks CO1  $\frac{\partial u}{\partial x} = 2 \frac{\partial u}{\partial t} + u$ PO2

# (UNIT-III)

5. 6 Marks L3 CO<sub>2</sub> PO1 Determine  $\frac{du}{dx}$  when  $u = x \log xy$  and  $x^3 + y^3 + 3xy = 1$ . a)

Define Jacobian for two variables and find the Jacobian of the b) 6 Marks L1 CO<sub>2</sub> PO1 variables  $u = \frac{x+y}{1-xy}$  and  $v \tan^{-1} x + \tan^{-1} y$ .

#### (**OR**)

- 6. a) Divide the number 24 into three parts such that the continued 6 Marks L4 CO<sub>2</sub> PO1 product of the first, square of the second and cube of the third PO<sub>2</sub> may be maximum.
  - Using Lagrange's method of undetermined multipliers, calculate 6 Marks L3 CO<sub>2</sub> PO1 b) the maximum value of xyz when x + y + z = a. PO<sub>2</sub>

# UNIT-IV

7.	a)	Evaluate $\iint_{R} xy dx dy$ where <i>R</i> is the region by	6 Marks	L5	CO2	PO1 PO2
		$x$ - axis, $x$ = 2a and $x^2$ = 4ay.				
	b)	Apply change the order of integration and evaluate	6 Marks	L3	CO2	PO1
		$\int_{0}^{\infty}\int_{x}^{\infty} \frac{e^{-y}}{y}  dy  dx  dx$				PO2
		(OR)				
8.	a)	Evaluate $\int \int \int a^{x+y+z} dz dy dx$	6 Marks	L5	CO2	PO1
	a)	Evaluate $\int_{0} \int_{0} \int_{0} e^{-\alpha 2\alpha y \alpha x}$				
	1 \	$\int_{\infty}^{\infty} \int_{0}^{\infty} -(x^{2}+y^{2}) 1 1$	6 Marks	L3	CO2	PO1
	b)	By changing to polar coordinates, evaluate $\iint_{0,0} e^{-\sqrt{x}+y} dxdy$ .				PO2
9.	a)	Determine directional derivative of the field $xy + yz + zx$ at the	6 Marks	L3	CO3	PO1
		point (1,1,1) in the direction of $\vec{i} + \vec{j} + \vec{k}$ .				
	b)	$\int (x^2 + xy) dx + (x^2 + y^2) dy$	6 Marks	L5	CO3	PO1
		Evaluate the line integral $\int_{c}^{c} (c + c + c + c + c + c + c + c + c + c $				PO2
		is the square formed by the lines $y = \pm 1$ and $x = \pm 1$ .				
		(OR)				
10		Verify Gauss divergence theorem for the field	12 Marks	L5	CO3	PO1
•		$\overline{F}(x^2 - yz)\overline{i} + (y^2 - zx)\overline{j} + (z^2 - xy)\overline{k}$ taken over the				PO2
		rectangular parallelepiped $0 \le x \le a$ , $0 \le y \le b$ , $0 \le z \le c$ .				

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#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

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#### 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**

**Answer One Question from each Unit** All questions carry equal marks UNIT-I List the conditions for sustained interference. 4 Marks 1. a) L1 CO1 PO1 8 Marks b) Describe the construction and working of a Nicol Prism. L2 CO1 PO1 (**OR**) Why do soap bubbles appear multicolored when viewed under 2. L1 CO1 **PO1** a) 2 Marks sun light? b) Explain necessary theory of Fraunhoffer diffraction due to 'n' 10 Marks L2 CO1 **PO2** slits. UNIT-II) Recall the principle behind the functioning of optical fiber. 9 Marks 3. L2 CO2 PO1 a) Explain the differences between the step index fiber and graded **PO2** index fiber. b) Calculate the numerical aperture and acceptance angle for an 3 Marks L3 CO<sub>2</sub> **PO2** optical fiber with core and cladding refractive indices being 1.48 and 1.45 respectively. (**OR**) 4. a) Derive an expression for acceptance angle and numerical 8 Marks L3 CO<sub>2</sub> PO1 aperture of an optical fiber. **PO2** List the applications of fiber optic sensors. b) 4 Marks L1 CO<sub>2</sub> **PO2** (UNIT-III) 5. Define electrical conductivity and develop an equation for 6 Marks L3 CO3 PO1 a) electrical conductivity of intrinsic semiconductors. **PO2** Distinguish the direct and indirect band gap semiconductors. b) 6 Marks L4 CO3 PO1 (**OR**) 6. Discuss the formation of extrinsic semiconductors. 5 Marks L2 CO3 PO1 a) Develop an equation for density of charge carriers in p-type 7 Marks b) L3 CO3 PO<sub>2</sub> semiconductors. UNIT-IV 7. a) Summarize the frequency dependence of various types of 6 Marks L2 CO<sub>4</sub> PO<sub>2</sub> polarizations with a neat graph. Define the terms: b) 6 Marks L1 CO<sub>4</sub> PO1 i) Dielectric material. ii) Dielectric constant. iii) Dielectric break down. (**OR**) 8. Define the terms magnetic field (H) and magnetic induction (B). 7 Marks L2 CO4 PO1 a) Discuss on soft and hard magnetic materials. What is Bohr magnetron? How it related to magnetic moment of b) 5 Marks L1 CO4 PO1 electron? **PO2** 

Max. Marks: 60

SVEC-19

Time: 3 hours

# UNIT-V

9.	a)	Is superconductors' exhibits diamagnetic nature? Justify. Outline	6 Marks	L2	CO5	PO1
		applications of superconductors in various fields.				
	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

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(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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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]

		information reenhology, computer selence and system	s Engineern	" <u>5</u> ]		
Ti	me: 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. (OR)	4 Marks	L2	CO1	PO1
2.		Write the main postulates of VSEPR Theory. How this theory explain the shapes of the molecules?	12 Marks	L 1	CO1	PO1 PO2
2			10 1 ( 1	т 2	000	DO 1
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	02	PO1 PO2 PO6
1	a)	(UK) Discuss the impurities in water and their consequences	7 Marks	12	$CO^{2}$	PO1
4.	a)	Discuss the impurities in water and then consequences.	/ WIAINS	LZ	002	PO6
	b)	Calculate the temporary, permanent and total hardness of a water sample containing $Mg(HCO_3)_2 = 73 \text{ mg/L}$ , $Ca(HCO_3)_2 = 162 \text{ mg/L}$ , $MgCl_2 = 95 \text{ mg/L}$ , $CaSO_4 = 136 \text{ mg/L}$ .	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
0		(OR)			<b>G A A</b>	<b>D</b> O 4
8.	a) b)	Explain different types of fundamental modes of vibrations.	6 Marks	L2	CO4	POI
	D)	Microscope.	o warks	LI	04	POI
		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. <b>(OR)</b>	6 Marks	L1	CO5	PO1
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

CO	DE No	.: 19BT10201	· · · · · · ·		<u>S'</u>	VEC-19
		Roll No	).			
		SREE VIDYANIKETHAN ENGINEERING CO (An Autonomous Institution, Affiliated to JNTUA, Ananthapur	<b>LLEGE</b> ramu)			
		I B.Tech I Semester (SVEC-19) Supplementary Examinat	tions Augu	st – 2	2021	
	[]	BASIC ELECTRICAL AND ELECTRONICS ENGI Electrical and Electronics Engineering, Electronics and Commu Electronics and Instrumentation Engineerin	NEERING unication En ng]	ngine	ering,	
Tin	ne: 3 h	ours Answer One Question from each Unit All questions carry equal marks		Ma	x. Mark	s: 60
		UNIT-I			~ ~ .	
1.	a)	Explain the principle of single loop generator for producing sinusoidal voltage.	6 Marks	L2	CO1	PO2
	b)	A 4 $\Omega$ resistor has a current <i>i</i> =2.5 <i>sin</i> (500 <i>t</i> )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	6 Marks	L2	CO1	PO2
		peak $v_m$ and angular frequency $\omega$ rad/s.				
3.	a)	With neat sketch, explain the operation of hydro power plant.	6 Marks	L1	CO2	PO1
	b)	Illustrate the significance of : i) Euse 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	6 Marks	L2	CO2	PO2
		methods of improving it.				
5.	a)	With neat sketch, demonstrate the working principle of single	6 Marks	L1	CO3	PO1
	b)	Explain the working principle of 3-phase induction motor and	6 Marks	L1	CO3	PO5
		mention any one application of it.				
6.	a)	Explain the constructional details of single phase capacitor start	6 Marks	L1	CO3	PO1
	b)	Explain the constructional details of synchronous machine and	6 Marks	L1	CO3	PO5
		mention any one application.				
7		Explain the operation of a n n investion diada in forward history	17 Manles	τn	CO4	
1.		and reverse biased conditions. Draw its V-I characteristics.	12 IVIAIKS	L2	004	POI
ĉ		(OR)		<b>.</b>	~~ ·	<b>D</b> 2 -
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 6 Marks L1 CO5 PO1 detail.
  - b) In an inverting adder circuit, the input voltages are 0.3V, 0.5V 6 Marks L3 CO5 PO4 and 0.1V while  $R_1=R_2=R_3=1$  K $\Omega$ . If  $R_f=10$  K $\Omega$ , calculate the output voltage.

## (OR)

- 10. a) Examine and derive an expression for  $V_0$  of the differentiator 6 Marks L2 CO5 PO2 circuit by using an Op-amp.
  - b) In an integrator circuit, R<sub>i</sub>C<sub>f</sub>=1 Sec., and the input is a step 6 Marks L3 CO5 PO4 voltage V<sub>in</sub>=2V for 0≤t≤4. Determine the output voltage and sketch it.

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**SVEC-19** 

Max. Marks: 60

#### 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

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
C		(OR)	10.14	T 0	000	DO 1
6.		pump with neat sketch.	12 Marks	L2	02	POI
		(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: 6 Marks L1 CO2 PO1 i) Belt drive. ii) Chain drive. iii) Rope drive. The central distance two shaft is 4m having two pulleys with CO2 PO1 b) 6 Marks L3 diameter having 500mm and 700mm respectively find the PO2 length of belt required
  - i) for open belt drive.

# UNIT-V

ii) for cross belt drive.

9. Give a comprehensive explanation of forging process. What are 12 Marks L2 CO2 PO1 its limitations? Mention some of its applications.

(OR)

10 Compare and contrast between taper turning and thread cutting 12 Marks L2 CO2 PO1 . operations.

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Roll No.

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 M						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	6 Marks	L3	CO1	PO2		
	)	number	• • • • • • • • • • • • • • • • • • • •					
	h)	Illustrate the concept of type casting in Python with examples	6 Marks	L2	CO1	PO1		
	0)	(OR)	0 marks	112	001	101		
2	a)	List and explain different types of literals	6 Marks	T 1	CO1	PO1		
4.	h	Explain about the top down design in prol em solving	6 Marks	I 1	CO1	PO1		
	0)		0 WILLING	LI	001	101		
					901	<b>D O A</b>		
3.	a)	Write a python script that will read an unspecified number of	6 Marks	L3	COI	PO2		
		integers and will determine how many positive and negative						
		values have been read. Your program ends when the input is 0.						
	b)	Display the following pattern using python script.	6 Marks	L3	CO1	PO2		
		1						
		212						
		32123						
		4321234						
		543212345						
		(OR)						
4.	a)	List and explain selection statements used in python with	6 Marks	L1	CO1	PO1		
		examples.						
	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	6 Marks	L3	CO1	PO2		
	)	palindrome or not		_		-		
		Ex: MADAM is a nalindrome						
	b)	Write a python script to demonstrate following string methods	6 Marks	L2	CO1	PO1		
	0)	index() find() count() split() ioin()	0 marks	112	001	101		
		( <b>OR</b> )						
6	a)	Develop a python script to read employee details like eid	6 Marks	13	CO1	PO3		
0.	u)	emphase branch salary and sort records based on emphase	0 Marks	LJ	001	105		
	h)	List the applications of stacks and queues	6 Marks	12	CO1	PO1		
	0)		0 WIAIKS	L/2	COI	101		
-	``			<b>T A</b>	<b>a a</b>	DO1		
7.	a)	Illustrate following file handling functions with an example	6 Marks	L2	CO2	POI		
		program.						
	• \	1) open() 11) read() 111) readline() 1v) readlines()			<b>a a</b>	<b>D</b> O1		
	b)	Define scope and explain usage of global keyword.	6 Marks	L2	CO2	POI		
		(OR)						
8.	a)	Define function. Explain four different types of arguments used	6 Marks	L1	CO2	PO1		
		in functions.		_				
	b)	Explain functionality of the following functions.	6 Marks	L2	CO2	PO1		
		i) ones() ii) arrange() iii) logspace() iv) zeros()						

# UNIT

Draw Histograms by considering continuous data. 9. PO3 6 Marks L3 CO2 a) Write a python script to drop the missing data from the data 6 Marks L3 CO2 PO3 b) frame. (OR) Create a data frame. It contains students' subject wise marks. 6 Marks CO2 10 a) L3 PO3 Add a new column name called total marks for the existing

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frame. b) Illustrate different techniques included in accessing data from 6 Marks L3 CO2 PO2 data frame.

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(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 $(D^3 - 7D^2 + 14D - 8)y = e^x Cos 2x$	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	6 Marks	L2	CO1	PO1
	,	$(x+1)^2 \frac{d^2 y}{dx^2} - 3(x+1)\frac{dy}{dx} + 4y = x^2 + x + 1$ into linear equation				PO2
		with constant coefficients and find the general solution.				
		(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>b</b> )	Find the complete solution of the partial differential equation	6 Martia	т 1	COI	
	0)	$p^2 - q^2 = x - y$ .	0 IVIAIKS	LI	COI	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	6 Marks	L3	CO1	PO1
		$\frac{\partial u}{\partial x} = 4 \frac{\partial u}{\partial y}$ , given that $u(0, y) = 8e^{-3y}$ .				PO2
5.	a)	Find $\frac{du}{dt}$ ; if $u = x^2 y^3$ , 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	6 Marks	L5	CO2	PO1
		$\frac{\partial(u,v)}{\partial(r,\theta)} = 4r^3 s.$				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 6 Marks L3 CO2 PO1 x + 2y + 3z = 14 using Lagrange's method of multipliers. PO2

# UNIT-IV

7.	a)	Evaluate $\iint xy  dxdy$ over the positive quadrant of the circle	6 Marks	L5	CO2	PO1 PO2
		$x^2 + y^2 = a^2 .$				102
	b)	Using change the order of integration evaluate $\int_{0}^{a} \int_{x^2}^{2a-x} xy^2 dy dx$ .	6 Marks	L3	CO2	PO1 PO2
		(OR)				
8.	a)	Evaluate $\int_{-\infty}^{e^{\log y}} \int_{-\infty}^{e^x} (\log z) dz dx dy$ .	6 Marks	L5	CO2	PO1
	b)	By changing into polar coordinates, Evaluate	6 Marks	L3	CO2	PO1
		$\int_{0}^{a} \int_{0}^{\sqrt{a^{2}-y^{2}}} (x^{2}+y^{2}) dx dy .$				PO2
9.	a)	Find the directional derivative of $f(x, y, z) = xy^3 + yz^3$ at the	6 Marks	L1	CO3	PO1
		point (2,-1,1) in the direction of the vector $\vec{l}_{l+2} \vec{j}_{l+2} \vec{k}$ .				
	b)	Compute the line integral $\int_{C} (y^2 dx - x^2 dy)$ about the triangle	6 Marks	L3	CO3	PO1 PO2
		whose vertices are $(1,0)(0,1)$ and $(-1,0)$ .				
		(OR)				
10		Verify Stoke's theorem for $\vec{F} = (x^2 + y^2)\vec{l} - 2xy\vec{J}$ taken around	12 Marks	L5	CO3	PO1 PO2
		the rectangle bounded by the lines $x = \pm a$ , $y = 0$ , $y = b$ ssw.				

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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]

Т	Time: 3	hours	J	Max.	Marks: 6	50
		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. (OR)	4 Marks	L4	CO1	PO1
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 1 <sup>st</sup> dark band and the next bright band are	4 Marks	L4	CO1	PO2
		formed.				
		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. (OR)	4 Marks	L2	CO2	PO1
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	4 Marks	L4	CO2	PO2
		numerical aperture of the fiber is 0.26. Calculate $\alpha_m$ and $\phi_m$ for the				
		fiber if the medium surrounding the fiber is air.				
		(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
6.	a)	What is Hall effect? Derive the expression for Hall coefficient.	8 Marks	L3	CO3	PO1
	,	Write its applications.				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	5 Marks	L2	CO4	PO1
		significance.				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

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### **ENGINEERING CHEMISTRY**

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering,

Information Technology, Computer Science and Systems Engineering]

Ti	me: 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 <sub>3</sub> 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. <b>(OR)</b>	6 Marks	L3	CO2	PO1 PO2
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 <sub>2</sub> fuel cell with reactions. (OR)	6 Marks	L2	CO3	PO1
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
		\$P \\$P \\$P				

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# 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

#### 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
r	a)	(OR) Define and explain the various modes of effective	6 Marka	12	CO1	DO1
۷.	a)	communication	0 WAIKS	L2	COI	PO1,
	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

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Max. Marks: 60

8.	a)	Discuss	at	length	with	suitable	examples	the	important	6 Marks	L2	CO1	PO1,
		technique	es fo	or good c	compre	hension of	f any type o	f read	ling				PO10
	<b>b</b> )	Idontify	th a	tonia	onton	a and th	a leave wear	da in	the tenie	6 Martra	ТЭ	CO1	DO1

b) Identify the topic sentence and the key words in the topic 6 Marks L2 CO1 PO1, sentence that the other sentences support in the paragraph PO10 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.

# 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

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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

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  $5\Omega$  is 100V, find the supply voltage.
  - iii) Find the power consumed by each resistor.



- b) A coil having a resistance of 7 and an inductance of 31.8mH is 6 Marks L3 CO1 PO2 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.

(OR)

- 2. a) A voltage  $v = 200 \sin \pi t$  is applied to a load having 200 $\Omega$  6 Marks L3 CO1 PO2 in series with 638mH inductor. Estimate power consumed by the load and reactive power of load.
  - b) Find the equivalent resistance across the terminals X and Y. 6 Marks L3 CO1 PO3



3. a) Discuss in detail to improve the power factor of a given power 6 Marks L2 CO2 PO1 system.
b) Explain the block diagram of inverter with details. 6 Marks L1 CO2 PO1 (OR)

6 Marks

L2

CO<sub>2</sub>

PO<sub>2</sub>

PO4

- 4. a) List out the difference between MCB and MCCB.
  - b) What is the importance of earthing and explain different types 6 Marks L2 CO2 of earthing?

6 Marks L3 CO1 PO3

Max. Marks: 60

		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.	6 Marks	L3	CO3	PO3
		ii) the voltage across the secondary winding if it has 20 turns. (OR)				
6.	a) b)	Explain the construction and working of synchronous machine. A 50Hz, 4-pole induction motor has an induced <b>emf</b> in the rotor with a frequency of 2 Hz. Calculate: i) synchronous speed ii) slip iii) speed of the motor	6 Marks 6 Marks	L2 L3	CO3 CO3	PO2 PO3
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) $\beta$ of the transistor. ii) $\alpha$ of the transistor. iii) $\alpha$ of the transistor.	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 $2V/\mu s$ . What is the maximum frequency of an output sinusoid of peak value 5V at which the	6 Marks	L3	CO5	PO4

distortion sets in due to the slew rate limitation?

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CODE No.: 19BT10341

Time: 3 hours

# SREE VIDYANIKETHAN ENGINEERING COLLEGE

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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** 

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.	12 Marks	L3	CO1	PO1 PO8
		111) Methods employed.				
2	-)	(UR)	4 \ \ ( 1	1.2	CO1	
2.	a)	Discuss now a civil engineer contributes to welfare of society.	4 Marks	L2	COI	POT PO5
	b)	Define composite materials. List out various applications, advantages and limitations of composites.	8 Marks	L1	CO1	PO1
2	a)	What is foundation? State the requirements of good foundations	6 Mortra	T 1	cor	
3.	a) h)	what is foundation? State the requirements of good foundations.	6 Marks		$CO_2$	POI DOI
	0)	brieffy describe various types of starts.	O IVIAIKS	LZ	02	PUI
1	a)	(UR)	6 Marka	τ 4	$CO^{2}$	
4.	a)	beuse connection for water supply	0 Iviai KS	L4	002	
	<b>b</b> )	Compare marits and demorits of flat and nitshed roofs	6 Marka	12	$CO^{2}$	
	0)		0 Iviai KS	LZ	002	rui
		UNIT-III				
5.		Discuss the working principle of single acting reciprocating	12 Marks	L2	CO3	PO1
		pump with the help of neat sketch.				PO5
6	a)	List out major parts of an IC engine Explain any four of them in	8 Marks	T 1	CO3	PO1
0.	<i>a)</i>	detail.	o wiarks	L/1	005	101
	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	8 Marks	L4	CO3	PO1
		with neat sketches.				PO8
		UNIT-V				
9	a)	Define welding Explain the working principle and operation of	8 Marks	L2	CO4	PO1
	u)	Arc welding	0 marito		001	101
	b)	Explain how forging improves the mechanical properties of	4 Marks	L4	CO4	PO1
	-)	components with neat sketch.				PO8
		(OR)				
10.	a)	Define Casting and discuss the merits and demerits of casting	8 Marks	L2	CO4	PO1
	,	process over other manufacturing methods.				
	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]

Tim	ne: 3 h	ours		Ma	x. 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	6 Marks	L1	CO1	PO1
		operators with the help of a Python script.				
		(OR)				
2.	a)	Briefly explain about efficiency of algorithms.	6 Marks	L1	CO1	PO1
	b)	What is meant by type conversion? Explain different type	6 Marks	L1	CO1	PO2
		conversions with help of a Python script.				
		(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	6 Marks	L1	CO1	PO1
		examples.				
4	a)	(UK)	6 Marka	12	CO1	DOJ
4.	a) b)	Write a Python script to display the sum of first 'n' natural	6 Marks		C01	PO2
	0)	numbers	U IVIAIKS	LZ	COI	102
5	a)	Define List and explain different operations that we can perform	6 Marks	T 1	CO1	PO1
5.	<i>a)</i>	on List with the help of a program	0 Iviai KS	LI	COI	101
	b)	Write a Python program to implement Queue	6 Marks	L1	CO1	PO2
	0)	(OR)	0 11 14 110	21	001	102
6.	a)	Define Dictionary and write a Python script to illustrate	6 Marks	L2	CO1	PO2
		Dictionary operations.				
	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	6 Marks	L2	CO2	PO2
		using functions.				
	b)	Write a Python script to read a file and display the total number	6 Marks	L2	CO2	PO3
		of words present in that file.				
0	-)	(OR)	( Maular	тэ	<b>CO</b> 2	DOO
8.	a)	Develop a Python program to find the maximum and minimum	6 Marks	L2	002	PO2
	b)	Demonstrate the basic file operations with the help of a Python	6 Marks	T 1	$CO^{2}$	PO2
	0)	script	U IVIAIKS	LI	002	102
0	a)	Write a Python program to display bar plot and histogram for	6 Marka	12	$CO^{2}$	DO3
9.	a)	student details like age weight and height	0 Iviai KS	L2	002	ros
	b)	Explain insertion and deletion of selected rows and columns from	6 Marks	L3	CO2	PO3
	0)	a data frame with the help of an example.	0 10141110	20	002	105
		(OR)				
10	a)	Illustrate the use of loc() and iloc() with an example program.	6 Marks	L2	CO2	PO1
	b)	Load data from <b>csv</b> file to data frame and print head() and tail()	6 Marks	L3	CO2	PO2
		of a data frame.				

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### 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 $\frac{d^2 y}{dx^2} + \frac{dy}{dx} + y = x^3$ .	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	7 Marks	L3	CO1	PO1						
		$y''-y=\frac{2}{(1+e^x)}$ .										
	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 $\phi$ 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 $u = x + y + z$ , $v = x^2 + y^2 + z^2$ , $w = x^3 + y^3 + z^3 - 3xyz$	7 Marks	L3	CO2	PO2						
		are functionally dependent and hence obtain the relation between them.										
		(OR)										

6.	a)	Examine the maxima and minima of the function	7 Marks	L3	CO2	PO2					
		$f(x, y) = x^3 y^2 (1 - x - y).$									
	b)	Using Lagrange's method of undetermined multipliers, calculate	7 Marks	L3	CO2	PO1					
		the maximum value of $x^2y^2z^2$ when $x + y + z = 1$ .									
	UNIT-IV										
7.	a)	Evaluate $\iint_{R} xydxdy$ , where R is the region bounded by the	7 Marks	L5	CO2	PO1					
		positive quadrant of the circle $x^2 + y^2 = a^2$ .									
	b)	Applying the change of order of integration, evaluate	7 Marks	L3	CO2	PO2					
		$1\sqrt{x}$									
		$\int_{0} \int_{x} xy  dy  dx$									
	(OR)										
0		$1\sqrt{1-x^2}\sqrt{1-x^2}-y^2$	7 Marks	L5	CO2	PO1					
8.	a)	Evaluate $\int_{0} \int_{x} \int_{0} xyz  dz  dy  dx$ .									
	b)	By changing to polar coordinates, evaluate the double integral	7 Marks	L3	CO2	PO2					
		$a\sqrt{a-y^2}$									
		$\int_{\Omega} \int (x^2 + y^2) dy dx$									
9.	a)	Determine the directional derivative of the field	7 Marks	L3	CO2	PO1					
	,	$\phi = x^2 yz + 4xz^2$ 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).									
	b)	Evaluate the line integral over a circular path	7 Marks	L5	CO2	PO1					
		$x^2 + y^2 = a^2$ , $z = 0$ for a vector field									
		$\overline{F} = \sin y \overline{i} + x(1 + \cos y) \overline{j}.$									
		(OR)									
10		Verify Gauss divergence theorem for the field	14 Marks	L5	CO2	PO2					
		$\overline{F} = (x^2 - yz) \overline{i} + (y^2 - zx)\overline{j} + (z^2 - xy)\overline{k}$ taken over a									
		rectangular parallelepiped $0 \le x \le a$ , $0 \le y \le b$ , $0 \le z \le c$ .									

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# 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

1.	a)	Describe the ion exchange process with a neat diagram. Ion	10 Marks	L2	CO1	PO1				
		exchange process is more advantageous than zeolite process. Why?								
	b)	List any four specifications of potable water as per WHO and	4 Marks	L1	CO1	PO6				
		BIS standards.								
	<u> </u>	(OR)		~ •	~~.	7.01				
2.	a)	Congratulations for running a project on 'drinking water supply	8 Marks	L2	CO1	PO1				
		by using brackish water to your college successfully. Outline								
	b)	A liter of standard hard water was prepared by dissolving 1 gram	6 Marks	13	CO1	PO2				
		A file of standard hard water was prepared by dissolving 1 grain of CoCO in distilled water 50 mL of this water required 46 mL	0 Iviaiks	LJ		r02				
		of CaCO <sub>3</sub> in distined water. 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.								
	UNIT-II									
3.		How can you apply Valence Shell Electron Pair Repulsion theory	14 Marks	L3	CO2	PO2				
		to predict the shapes of various molecules?								
	(OR)									
4.		Derive the Schrodinger wave equation and write its significance.	14 Marks	L3	CO2	PO1				
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:	2 Marks	L1	CO3	PO1				
		$M^{n+}(aq) + ne^{-} \rightarrow M(s)$								
	•									
7.		Discuss the principle and working of a UV-Visible spectrometer	14 Marks	L2	CO4	PO1				
		with the help of a block diagram.								
		(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	10 Marks	L2	CO5	PO1					
		machines and moving surfaces under very high pressure and									
		speed.									
	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	14 Marks	L2	CO5	PO1					
		write the advantages, disadvantages of synthetic petrol.									

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(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 <sup>th</sup> ring was found to be 0.45cm and the 5 <sup>th</sup> 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					
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					
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	7 Marks	L1	CO5	PO1				
		different from the properties of a bulk material?								
	b)	Explain the various properties of nanomaterials.	7 Marks	L2	CO5	PO1				

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Time: 3 hours

## 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]

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	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
F	- )		7 ) (	тэ	<b>CO</b> 2	<b>DO</b> 2
Э.	a)	of a projectile in inclined projection.	/ Marks	L2	02	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 $0.5m^2$ . 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
0	`	(OR)	0 1 1	T <b>A</b>	002	<b>DO</b> 1
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	002	POI
	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. (OR)	7 Marks	L2	CO3	PO1
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

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Time: 3 hours

## **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 ]

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	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	14 Marks	L4	CO4	PO10
3	a)	"Listening involves a more conhisticated mental process than	7 Marks	12	$CO^{2}$	PO2
5.	<i>a)</i>	hearing". Explain.	/ Iviaiks	L	002	102
	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".	7 Marks	L2	CO4	PO10
	1 \	Illustrate.	- > ( 1	<b>T</b> 1	004	<b>DO10</b>
	b)	What is the significance of conference in developing analytical and questioning skills?	7 Marks	LI	CO4	POI0
_		(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
	D)	the paragraph.	/ Marks	L2	02	PO2
0		(OR)	14 Mortra	1.2	$CO^{2}$	DO5
0.		UNIT-V	14 Marks	L2	COS	POS
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
•						

Time: 3 hours

## 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 ]

Max. Marks: 70

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

## UNIT-I

1. Determine the resultant of three forces acting at a point as shown 7 Marks CO1 PO1 a) L4 in the Fig.1. PO2 PO6



Fig.1

A circular roller of weight 1000 N and radius 20cm hangs by a b) 7 Marks L4 CO1 PO1 tie AB = 40cm and rests against a smooth vertical wall at C as **PO2** shown in the Fig.2. Determine the tension in the rod and reaction PO4 at point C. PO6 **PO10** 



(**OR**)

2. Describe different types of beam with neat sketch. 4 Marks L1 CO1 PO1 a) PO10 What kind of frame is the given truss? Determine the forces in all b) 10 Marks  $\mathbf{I4}$ CO1 PO1 the members of a truss shown in Fig.3. using method of joints. PO2 PO4 PO5 PO6 - :11 PO10  $4 \mathrm{m}$ 60 kN Fig.3



**PO10** 

10cm Fig.6

## 2

(**OR**)

7cm

2cm

100 N

- A block weighing 1000N rests over block B which weighs 14 Marks 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.

4.

- A B Fig.5 UNIT-III
- 5. State and prove the theorem of parallel axis. a)

lcm

- Find the centroid of the L section shown in below Fig.6. b) Section A-A<sup>4</sup>



- 7 Marks L1 CO2 PO1 **PO10** 7 Marks L4 CO2 PO1 PO2 PO4
  - PO6 **PO10**

PO1

PO2

PO4

PO6

**PO10** 

CO<sub>2</sub>

L4

UNIT-II

- Explain the laws of friction in detail. 3. a)
  - 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.



shown in Fig.7. PO<sub>2</sub> PO4 2.5cm 2.5cm PO5 **PO10** 2.5cm 5'cm 5cm 10cm в А D 12.5cm Fig.7 UNIT-IV Describe the stress strain relationship for mild steel bar. 7. 7 Marks L1 CO<sub>4</sub> PO1 a) PO10 b) A steel bar 60mm wide, 15mm thick and 350mm long is 7 Marks L4 CO<sub>4</sub> PO1 subjected to an axial pull of 90KN. Determine the changes in the **PO2** length, width, thickness and the volume of the bar due to the pull PO4 applied. Take  $E = 2 \times 10^5 \text{ N/mm}^2$  and  $\mu = 0.32$ . PO5 PO<sub>6</sub> **PO10** (**OR**) In a tensile test, a test piece 25mm in diameter, 250mm gauge 8. CO<sub>4</sub> 14 Marks L4 PO1 length, stretched 0.105mm under a pull of 70kN. In a torsion test, **PO2** the same rod twisted 0.015 radian over a length of 250mm, when PO4 a torque of 450Nm was applied. Find the three elastic moduli and PO5 the Poison's ratio for the material of the test piece to identify the PO6 strength properties of the material. PO10 UNIT-V A boiler shell is to be made of 15mm thick plate having tensile 9. CO5 PO1 14 Marks L6 stress of 120MN/m<sup>2</sup>. If the efficiencies of the longitudinal and **PO2** the circumferential joints are 70% and 30 % respectively, PO3 determine : PO4 i) Maximum permissible diameter of the shell for an internal PO5 PO6 pressure of 2 MN/m<sup>2</sup>. PO10 ii) Permissible intensity of internal pressure if the shell diameter is 1.5m. (**OR**) 10 A thick wall closed-end cylinder is made up of an aluminum 14 Marks L4 CO5 PO1 alloy (E = 72 GPa,  $\mu$  = 0.33), has inside diameter of 200mm and **PO2** outside diameter of 800mm. The cylinder is subjected to internal PO4 fluid pressure of 150MPa. Determine the principal stresses and PO5 maximum shear stresses at a point on the inside surface of the PO<sub>6</sub>

Determine the centre of gravity of the plane uniform lamina

14 Marks

L4

CO<sub>3</sub>

PO1

**PO10** 

6.

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cylinder. Also determine the increase in inside diameter due to

fluid pressure.

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#### 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 The voltage and current through circuit elements are 1. 8 Marks L2 CO1 **PO2** a)  $v = 100 \sin (314 t + 45^{\circ})$  volts  $i = 10 \sin (314 t + 315^{\circ})$  amperes i) Identify the circuit elements. ii) Find the value of the elements. iii) Obtain an expression for power. b) Define the following terms 6 Marks L1 CO1 PO1 i) Real power. ii) Reactive Power. iii) Apparent Power. iv) Power Factor. (**OR**) PO1 2. Find an equivalent inductance of the network shown in fig. 7 Marks L2 CO1 a) 4 H 000 3 H 2 H 3 H 5 H 4 H AO  $\overline{\mathbf{m}}$ 000 000 000 000 -0 A 5 H 4 H 000 000 State Kirchhoff's laws and validate the laws with a suitable 7 Marks L2 CO1 PO1 b) example. UNIT-II ) With neat sketch, explain the operation of hydro power plant. 7 Marks L2 3. CO<sub>2</sub> PO7 a) How does hydropower plant superior compared to a thermal power plant in terms of environmental prospect? Explain the operation of MCB with the help of relevant diagram. 4 Marks L2 CO<sub>2</sub> PO1 b) Explain the significance of Energy Efficiency ratio. 3 Marks L2 CO<sub>2</sub> PO8 c) (**OR**) Mention the differences between MCB and MCCB. 7 Marks L2 CO<sub>2</sub> **PO2** 4. a) Mention the disadvantages of low power factor. Suggest suitable 4 Marks L2 CO<sub>2</sub> **PO2** b) methods to improve the power factor. Explain the objective of BEE standard. L2 c) 3 Marks CO<sub>2</sub> PO8 UNIT-III) 5. Explain the principle of operation and constructional features of a 14 Marks L2 CO3 **PO1** three phase induction motor. Mention its applications. (**OR**) With neat sketch, demonstrate the working principle of single 6. 7 Marks L2 CO3 PO1 a) phase transformer. Explain the constructional details and working of single phase L2 b) 7 Marks CO3 PO1 resistor start induction motor.

		UNIT-IV				
7.		Explain the operation of full-wave-rectifier without filter and derive the expressions for ripple factor. % regulation, efficiency	14 Marks	L2	CO4	PO2
		and PIV.				
		(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	7 Marks	L2	CO4	PO1
		Common Emitter configurations.				
		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

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

#### MATERIAL SCIENCE AND ENGINEERING

#### [Mechanical Engineering]

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	ime: 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	6 Marks	L1	CO1	PO1
		temperatures, phases and boundaries existing in it.				
		(OR)				
2.	a)	Define solid solution. Differentiate between Substitutional and	7 Marks	L2	CO1	PO1
		Interstitial solid solutions with neat sketches. Also write Hume-				PO2
	1-)	Rotnery's rule for formation of solid solutions.	7 ) (1	T <b>7</b>	CO1	DO1
	D)	write all invariant reactions in phase diagram and explain the	/ Marks	L2	COI	PO1 PO2
		cutectola zone offerty with heat sketch.				PO2
						103
2	``		7 ) ( 1	та	001	DO 1
3.	a)	steel" Explain the reason behind this statement	/ Marks	L3	COI	POI
	<b>b</b> )	List the objectives of heat treatment of metals	7 Morka	T 1	CO1	PO2 PO1
	0)	List the objectives of heat treatment of metals.		LI	COI	101
4	a)	Differentiate between Austempering and Martempering	7 Marks	L1	CO1	PO2
••	b)	Write the importance/objectives of continuous cooling	7 Marks	L2	CO1	PO1
	- )	transformation diagrams.				-
		(UNIT-III)				
5.	a)	Describe the stainless steels with respect to composition,	7 Marks	L1	CO2	PO1
5.	,	properties and applications.				PO2
	b)	Give the classifications and applications of low alloy steels. Also	7 Marks	L2	CO2	PO1
		give the specifications of steels.				
_		(OR)				
6.		Give the composition, microstructure and applications of:	14 Marks	L1	CO2	POI
		1) Grey cast iron. 11) Malleable iron.				PO2
		iii) white cast from.				PO3
_	`			<b>T A</b>	<b>a a</b>	DO 1
7.	a)	What alloys of copper are mainly used in engineering	8 Marks	L3	CO2	POI
		and fields of use				
	b)	List the properties and applications of Nickel based alloys	6 Marks	L1	CO2	PO1
	0)	(OR)	0 101001110	21	002	101
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	7 Marks	L2	CO2	PO3
		properties.				
	b)	Differentiate between particle reinforced and fiber reinforced	7 Marks	L2	CO2	PO3
		composites.				
10	`	(OR)		т 1	000	
10	a)	initiations and applications of Metal matrix	ð ivlarks	LI	002	POI
•		composites and ceranic matrix composites.				r02

Explain classification, properties and applications of polymer b) 6 Marks L1 CO2 PO1

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#### 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

# Answer One Question from each Unit

All questions carry equal marks

## UNIT-I

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

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.

b) An electric light fixture weighing 15N hangs from a point C, by two strings AC and BC. The string AC is inclined at 60° to the horizontal and BC at 45° to the horizontal as shown in figure below. Determine the forces in the strings AC and BC using Lami's theorem.



3.	a)	What are the requirements of good foundation?	6 Marks	L2	CO1	PO1
	b)	Explain different types of bonds used in brick masonry with sketches.	8 Marks	L2	CO1	PO8 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 7 Marks L4 CO1 PO1 harvesting systems.
 PO5 PO7

PO2

PO5

PO1 PO2

PO1

PO2 PO10

Max. Marks: 70

6 Marks

8 Marks

I.4

L4

CO1

CO1

		(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
		\$\$ \$\$ \$\$				

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#### 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 ]

Max. Marks: 70

Time: 3 hours

### 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	7 Marks	L2	CO1	PO1
		a program.				
	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	7 Marks	L3	CO1	PO3
		numbers.				
		(OR)				
4.	a)	Define Flowchart. Draw the flowchart that shows the addition of	7 Marks	L2	CO2	PO3
		two numbers.				
	b)	Explain the problem solving aspects.	7 Marks	L2	CO2	PO1
		(UNIT-III)				
5.	a)	Define an Array. Explain the declaration, initialization and	7 Marks	L2	CO3	PO1
		accessing of Array elements with a suitable program.				
	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	7 Marks	L2	CO3	PO1
		call-by-value with a suitable example.				
	b)	Write a C program that demonstrates the scope of <i>auto</i> and	7 Marks	L3	CO3	PO3
		extern variables.				
		(UNIT-IV)				
7.	a)	Compare <i>void</i> pointer and <i>NULL</i> pointer with a suitable	7 Marks	L2	CO3	PO2
		program.				
	b)	Define call-by-address. Write a C program to swap the values of	7 Marks	L3	CO3	PO3
		two variables using the call-by-address.				
		(OR)				
8.	a)	Explain the following with a suitable example:	7 Marks	L2	CO4	PO1
		i) Pointer arithmetic. ii) Array of pointers.			~~ .	
	b)	Write a C program to allocate the memory dynamically to an	7 Marks	L3	CO4	PO3
		Array of length $N$ . Write the necessary code to store and display				
		<i>N</i> integer elements.				

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 <i>N</i> 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

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## I B.Tech I Semester (SVEC-20) Regular Examinations April – 2021

## DISCRETE MATHEMATICAL STRUCTURES

#### [ Computer Science and Business Systems ]

Max. Marks: 70

Time: 3 hours

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

1.	a)	Using Truth Table show that	7 Marks	L4	CO1	PO2		
		$\left  \left( (P \lor Q) \land \sim (\sim P \land (\sim Q \lor \sim R)) \right) \lor (\sim P \land Q) \lor (\sim P \land \sim R) \right $						
		is a tautology.						
	b)	Obtain principal conjunctive normal form for the formula	7 Marks	L3	CO1	PO4		
	Í	$Q \wedge (P \vee -Q)$ without using Truth Table.						
		(OR)						
2.	a)	Are these premises $p \rightarrow r, q \rightarrow r, (p \lor q) \rightarrow r$ consistent? Justify	7 Marks	L2	CO1	PO1		
		the answer.						
	b)	Write the following statement in the symbolic form.	7 Marks	L3	CO1	PO2		
		"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"						
				1				
3.	a)	Let $X = \{1, 2, 3\}$ $Y = \{p, q\}$ and $Z = \{a, b\}$	7 Marks	L2	CO2	PO1		
		Also: $f: X \to Y$ be $f = \{(1, p), (2, q), (3, q)\}$						
		$g: Y \rightarrow Z$ be $g = \{(\mathbf{p}, \mathbf{b}), (\mathbf{q}, \mathbf{p})\}$						
		Find fog, fof, gog.						
	b)	Let $S = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ and the relation R on the set S is	7 Marks	L2	CO2	PO2		
	$  R = \{ (x, y) / x + y = 10 \}.$ What are the properties of on R?							
4	- )	(UR)	7 Maulas	1.2	002	<b>DO</b> 2		
4.	a)	and transitive relations	/ Marks	L3		PO2		
	b)	Illustrate that (S /) is a lattice under poset where $S = (1, 2, 3, 6)$	7 Marks	L2	CO2	PO1		
		and / is for divisibility.	/ 1/14/115		002	101		
	1							
5.	a)	Let z be the set of integers and addition, multiplication are	7 Marks	L3	CO3	PO3		
		binary operations on set (+,*)	,					
		i) Find whether $(z, +)$ is monoid or not.						
		ii) Find whether $(z, +)$ is group or not.						
	b)	In a monoid, show that the set of all left invertible element form	7 Marks	L3	CO3	PO4		
		a sub monoid.						
		(OR)						
6.	a)	Let <b>f</b> be a homomorphism from a group $G_1$ to the group $G_2$ then	7 Marks	L3	CO3	PO4		
		show that if $e_1$ is the identity in $G_1$ and $e_2$ is the identity in $G_2$						
		then $f(e_1) = e_2$						
	b)	(G,*) is a group and (a, b)€G then show that $(a * b)^{-1} = b^{-1} * a^{-1}$ .	7 Marks	L3	CO3	PO4		

7.	a)	Compute the number of six letter combinations of the letter of English alphabet. If no letter is to appear in the combination	7 Marks	L3	CO4	PO3
		more than 2 times.				
	b)	Find the coefficient of $x^{23}$ and $x^{32}$ for the function $(1 + x^5 + x^9)^{10}$ .	7 Marks	L3	CO4	PO3
	1	(OR)	<b>7</b> ) ( 1			DOA
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 $n \ge 0$ using Mathematical induction	7 Marks	L3	CO4	PO4
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
		d c v v v v v v v v v v v v v v v v v v				
		(OR)				
10	a)	How many paths of length four are there from <i>a</i> to <i>d</i> in the simple graph of G given below.	7 Marks	L3	CO5	PO3
	b)	Draw the complete graph of <i>K</i> 5 with vertices A, B, C, D, E. And also find sub graph of <i>K</i> 5 with 4 vertices.	7 Marks	L3	CO5	PO1

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#### 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 Ouestion from each Unit** All questions carry equal marks UNIT-I 1. "The survival of a large organization depends upon access to 7 Marks L2 CO1 **PO2** a) high-quality information". Justify this statement with relevant examples. Explain the levels of managerial decision making process. CO1 b) 7 Marks L2 PO1 (OR)2 How can computer-based information systems 7 Marks L3 CO1 **PO1** a) help an organization to achieve a strategic advantage over its competitors? Explain the reasons for the adoption of enterprise resource b) 7 Marks L2 CO1 PO1 planning systems in organizations. UNIT-II Explain the component of computer system with neat diagram. L3 CO2 PO1 3. a) 7 Marks Discuss about the reasons for the continued use of mainframe 7 Marks L4 CO2 **PO2** b) computers? (**OR**) Illustrate different built-in functions of Spreadsheet program. L2 4. a) 7 Marks CO<sub>2</sub> PO<sub>2</sub> 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 7 Marks L2 CO3 **PO1** organization? CO3 b) Compare and contrast OLAP and OLTP. 7 Marks L2 **PO2** (**OR**) Explain the role of data marts when an organization has an L3 CO3 PO1 6. a) 7 Marks existing data warehouse. What are the advantages of a real-time data warehouse? CO3 b) 7 Marks L1 PO1 ( UNIT-IV ) Describe the two main functions of an Internet Service Provider 7. 7 Marks L3 CO<sub>4</sub> a) PO<sub>2</sub> (ISP). How does ISP differ from applications service providers? Name the three ways in installing a local-area network which 7 Marks L2 CO4 PO1 b) reduce costs. Explain how it is achieved. (**OR**) 8. Explain the term 'electronic data interchange'. What is its 7 Marks L2 CO<sub>4</sub> PO1 a) relevance to companies now that the Internet is widely used for data exchange? Explain the purpose of a network operating system. 7 Marks CO4 PO1 b) L1 UNIT-V 9. Compare and contrast different levels of integration in Supply L4 **CO6 PO2** a) 7 Marks Chain Management (SCM) with suitable example. How transaction processing systems are managed, given their b) 7 Marks L4 CO5 **PO2** mission-critical role in many organizations? (**OR**) How workflow software and groupware assist in re-engineering 10 7 Marks L3 CO5 PO<sub>2</sub> a) of an organization? b) Discuss special precautions needed to be taken when using IT for 7 Marks L2 CO6 **PO1** managing human resources.

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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)]

r	Time: 3	hours		Max.	Marks: 7	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 $\frac{d^2 y}{dx^2} - 2 \frac{dy}{dx} + y = xe^x \sin x$ .	7 Marks	L3	CO1	PO2
	b)	Solve the following differential equation by the method of	7 Marks	L3	CO1	PO2
		variation of parameters $y'' - 6y' + 9y = \frac{e^{3x}}{x^2}$ .				
		UNIT-II				
3.	a)	Construct the partial differential equation by eliminating the arbitrary function $\phi$ 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 $\phi$ 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
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	7 Marks	L3	CO2	PO2
		x+y+z=1.				
		(OR)				
6.	a)	If $x = e^r \sec \theta$ , $y = e^r \tan \theta$ then show that $\frac{\partial(x, y)}{\partial(r, \theta)} x \frac{\partial(r, \theta)}{\partial(x, y)} = 1.$	7 Marks	L2	CO2	PO1
	b)	Find the dimensions of the rectangular box requiring least	7 Marks	L1	CO2	PO2

material for its construction when the box is open at the top is to

have a volume of 32 cubic feet.

(UNIT-IV)

7.	a)	Evaluate $\iint_{R} y  dx  dy$ where R is the region bounded by the first	7 Marks	L5	CO2	PO2
		quadrant of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ .				
	b)	Evaluate $\int_{-10}^{1} \int_{x-z}^{z} \int_{x-z}^{x+z} (x+y+z) dy dx dz$	7 Marks	L5	CO2	PO1
		(OR)				
8.	a)	By changing the order of integration, evaluate	7 Marks	L2	CO2	PO2
		$\int_{0}^{10} \int_{\sqrt{x}}^{1} \cos y^3  dy  dx$				
	b)	Evaluate $\int_{0}^{a} \int_{0}^{\sqrt{a^2 - x^2}} y \sqrt{x^2 + y^2} dy dx$ by transforming into	7 Marks	L5	CO2	PO2
		polar coordinates.				
		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	7 Marks	L1	CO3	PO1
		the point $P(1,2,3)$ in the direction of the line PQ where Q is the point $(5,0,4)$ .				
		(OR)				
10		Verify Green's theorem for $\int_{C} (xy + y^2) dx + x^2 dy$ , where c is	14 Marks	L5	CO3	PO2
		bounded by $y = x$ and $y = x^2$ .				
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## SREE VIDYANIKETHAN ENGINEERING COLLEGE

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#### 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 Describe the zeolite process used for softening of water with a 8 Marks L2 CO1 PO1 a) neat diagram and mention its limitations. b) Discuss the effect of fluorides present in drinking water on 6 Marks L2 CO1 PO6 human health. (**OR**) Explain reverse osmosis process used for desalination of brackish 7 Marks L2 CO1 PO1 a) water and mention its advantages. 0.50 g of CaCO<sub>3</sub> was dissolved in HCl and the solution made up 7 Marks L3 CO1 PO2 b) 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. UNIT-II ) Derive the expression for Schrodinger wave equation and explain 7 Marks L3 CO<sub>2</sub> PO1 a) the significance of  $\Psi$  and  $\Psi^2$ . b) Predict the magnetic behavior and calculate the bond order of  $O_2$ 7 Marks L3 CO<sub>2</sub> PO2 molecule based on its energy level diagram. (**OR**) Discuss the Postulates of molecular orbital theory. 10 Marks L2 CO<sub>2</sub> PO1 a) Identify and draw the shapes of the following molecules using 4 Marks L3 CO2 b) PO2 VSEPR theory, i) XeF<sub>4</sub> ii) NH<sub>3</sub> iii) BrF<sub>5</sub> and iv) ClF<sub>3.</sub> (UNIT-III) Define battery. Explain the construction and working principle of 8 Marks L2 CO3 PO1 a) Lithium ion battery. Discuss how underground pipelines and cables can be protected 6 Marks L2 CO3 PO2 b) from corrosion. (**OR**)

6. Discuss the construction and working of H2-O2 fuel cell and 7 Marks L2 CO3 PO1 a) identify its advantages and limitations. Define corrosion and explain galvanic corrosion with examples. b) 7 Marks L2 CO3 **PO1** UNIT-IV) 7

a)	Write the principle and applications of Scanning Electron	7 Marks	L1	CO4	PO1
	Microscope.				
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;	5 Marks	L3	CO5	PO2
		carbon = 70%, hydrogen = 20%, nitrogen = 7%, sulphur = 1%				
		and $ash = 3\%$ , latent heat of steam = 585 kcal/kg.				
		(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

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		SREE VIDYANIKETHAN ENGINEERING CO (An Autonomous Institution, Affiliated to JNTUA, Ananthapur	<b>LLEGE</b> ramu)			
		I B.Tech I Semester (SVEC-20) Supplementary Examination	ons Septem	ber –	2021	
		<b>ENGINEERING PHYSICS</b>				
		[ Electrical and Electronics Engineering, Electronics and Comm Electronics and Instrumentation Engineerin Computer Science and Engineering (Artificial Inte Computer Science and Engineering (Data Scien	unication E lg, lligence), nce) ]	nginee	ering,	
,	Time: 3	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. (OR)	12 Marks	L2	CO1	PO2
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
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
6		(OR)	2 Maulta	10	$CO^{2}$	
0.	a) b)	Describe the construction and working of a semiconductor laser	2 Marks 10 Marks	L2 12	CO3	PO1 PO1
	0)	diode with relevant diagrams.		L2	003	
	C)	of band gap 1.44 eV.	2 Marks	L3	003	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

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

#### APPLIED PHYSICS

#### [Civil Engineering]

Time: 3 hours Max. Marks: 70 **Answer One Ouestion from each Unit** All questions carry equal marks UNIT-I Define critical angle. Develop an expression for acceptance angle 10 Marks L3 CO1 **PO1** 1. a) of an optical fiber. Calculate the refractive indices of the core and cladding material b) 4 Marks L3 CO1 PO2 of a fiber if numerical aperture is 0.20 and refractive index difference  $\Delta = 0.0415$ . (**OR**) 10 Marks 2. a) Discuss the construction and working of an optical fiber. L2 CO1 PO1 Identify any four applications of fiber optic sensors. 4 Marks L3 b) CO1 PO1 UNIT-II Recall absorption co-efficient with its units. Outline the basic 3. a) 12 Marks L2 CO1 PO1 requirements for an acoustically good hall. A cinema hall has a volume of 7500m<sup>3</sup>. What should be the total L1 CO1 b) 2 Marks PO2 absorption in the hall if the reverberation time of 1.5 sec is to be maintained? (**OR**) 4. Explain the production of ultrasonic 9 Marks L2 CO1 a) waves using PO1 magnetostriction method with a neat diagram. List any two draw backs of this method. Choose any five important applications of ultrasonics. b) 5 Marks L3 CO1 PO1 UNIT-III) 5. Define instantaneous velocity. Explain with sketches the 14 Marks L2 CO<sub>2</sub> PO1 construction and uses of i) displacement-time graph. ii) velocity-time graph and iii) acceleration-time graph. (OR)Define terms work, energy and power with units. 6 Marks CO2 PO1 6. L1 a) State and derive the work-energy principle. 8 Marks L3 CO2 PO2 b) UNIT-IV Select any three modes of heat transfer and explain. 7. L2 CO2 PO1 a) 7 Marks Derive the expression for effective thermal conductivity through b) 7 Marks L3 CO2 PO2 compound media in series. (**OR**) 8. Describe the method to determine the thermal conductivity of a 10 Marks L2 CO2 PO1 a) bad conductor using Lee's disc method. Predict how much heat will be conducted through a slab of area 4 Marks L3 CO<sub>2</sub> **PO2** b)  $90 \times 10^{-4} m^2$  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

 $0.04Wm^{-1}K^{-1}$ .

# 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	8 Marks	L2	CO3	PO1
		Alloys with its characteristics.				
	b)	List few applications of Shape Memory Alloys.	6 Marks	L1	CO3	PO1

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Time: 3 hours

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## SREE VIDYANIKETHAN ENGINEERING COLLEGE

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#### 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

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. (OR)	7 Marks	L2	CO2	PO2
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. (OR)	7 Marks	L2	CO2	PO2
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
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
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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7 Marks

SVEC-20

Max. Marks: 70

CO1

CO1

PO1

**PO10** 

PO1

**PO2** 

PO4

**PO10** 

PO5 PO6 PO10

PO10

L4

L4

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

## **ENGINEERING MECHANICS**

[Civil Engineering]

Time: 3 hours

3.

a)

**b**)

Answer One Question from each Unit All questions carry equal marks



1. State and prove Lami's theorem. a)

> Determine the reactions at the supports of the given loaded beam b) 7 Marks shown in the Fig.1.



(OR)

- 2. What is perfect frame and imperfect frame? Write the advantage 4 Marks CO1 PO1 L4 a) of method of sections as compared to method of joints. PO<sub>2</sub>
  - b) Identify the truss type and determine the forces in all the 10 Marks L4 CO1 PO1 members of a truss shown in Fig.2 using method of joints. **PO2** в 30kN-----PO4



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<sup>o</sup>. A man weighing 800 N climbs the ladder. At what position

will he induce slipping? The co-efficient of friction for both the

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

contact surfaces of the ladder with the wall and the floor is 0.2.

7 Marks L4 CO<sub>2</sub> PO1 PO2 PO4 PO<sub>6</sub> PO10 CO<sub>2</sub> 7 Marks L4 PO1 **PO2** PO4 PO6





		(OR)				
4.	a)	What is friction? Explain how friction is both desirable and undesirable in engineering applications and also state the laws of	7 Marks	L2	CO2	PO1
	1 \	static and dynamic friction.	7 1 1	т 4	002	DO 1
	D)	A body of weight 50 N is placed on a rough horizontal plane. To	/ Marks	L4	002	POI
		just move the body on the horizontal plane is required. Find the				PO2 PO6
		coefficient of friction between the body and the plane				PO10
		(UNIT-III)				1010
5.	a)	Define the following:	4 Marks	L1	CO3	PO1
		i) Centroid. ii) Centre of gravity. iii) Moment of inertia.				
	b)	Find the area moment of inertia about the x and y axes of the	10 Marks	L4	CO3	PO1
		plane area shown in Fig.4.				PO2
		× i				PO4
						PO5
		20 mm				POIO
		► 80 mm ←				
		200 mm				
		80 mm -				
		20 mm 2				
		- 100 mm				
		Fig.4				
c.		(OR)			~ ~ •	

6.	a)	State and prove theorems of Pappus–Guldinus.

b) Calculate the centroid of T-section shown in the Fig.5.





7. a) A bar of uniform cross sectional area 100mm<sup>2</sup> is subjected to 7 Marks L4 CO4 PO1 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<sup>5</sup> N/mm<sup>2</sup>.
 PO5 PO10

1kN	3kN ◀		4kN	2kN
j	300mm	400mm	600mm	
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	b)	The following data refer to a mild steel specimen tested in a laboratory.	7 Marks	L4	CO4	PO1 PO2
		Diameter of the specimen $= 20 \text{ mm}$				PO4
		Length of the specimen $= 250 \text{ mm}$				PO5
		Extension under a load of $10 \text{ kN} = 0.035 \text{ mm}$				PO6
		Load at yield point = $120.15$ kN				PO10
		Maximum load = $195.50 \text{ kN}$				
		Length of the specimen under failure $= 300 \text{ mm}$				
		The neck diameter = $15.25 \text{ mm}$				
		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.				
		(OR)				
8.	a)	Derive the relationship between Young's modulus and bulk modulus.	7 Marks	L4	CO4	PO1 PO2
	1 \			т 4	004	POIO
	b)	Compound tube consist of a steel tube 130mm internal diameter	/ Marks	L4	CO4	POI
		and 100mm thickness and an outer brass tube 150mm internal				PO2
		diameter and 100mm thickness. The two tubes are of same				PO4
		length. The compound tube carries an axial load of 950kN.				PO6
		Identify the stresses and the load carried by each tube and the				POIO
		amount it shortens. Length of each tube is 150mm. $E = 2 \times 10^5 \text{ N/mm}^2$ and $E = 1 \times 10^5 \text{ N/mm}^2$				
		$E_s = 2 \times 10^6$ N/mm <sup>-</sup> and $E_b = 1 \times 10^6$ N/mm <sup>-</sup> .				
		UNIT-V				
9.	a)	Derive the circumferential stress and longitudinal stress of a thin	7 Marks	L4	CO5	PO1
		cylinder with neat sketch.				PO2
						PO10
	b)	Calculate the thickness of the metal required for a cast iron main	7 Marks	L6	CO5	PO1
		800mm in diameter for water at a pressure head of 100m, if the				PO2
		maximum permissible tensile stress is 20 MN/m <sup>2</sup> and weight of				PO3
		water is 10 kN/m <sup>3</sup> .				PO4
						PO5
						PO6
						PO10
		(OR)				
10		Mention the assumptions in Lame's theory. Derive Lame's	14 Marks	L4	CO5	PO1
		equation for radial and circumferential stress of thick cylinder.				PO2
						PO10



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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 7 Marks L2 CO1 PO1 single loop generator.
  - b) Find the current delivered by the source in the network shown 7 Marks L3 CO1 PO2 below.



(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	7 Marks	L2	CO1	PO1
		peak $V_m$ and angular frequency $\omega$ rad/s.				
		UNIT-II				
3.	a)	Is Hydro Power plant a sustainable electrical source of	7 Marks	L2	CO2	PO7
		generation? Justify your answer. Also, with neat sketch, explain				
		the operation of hydro power plant.				
	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	3 Marks	L2	CO2	PO8
		while purchasing any electrical product?				
		(OR)				
4.	a)	With neat sketch, explain the operation of sustainable power	7 Marks	L2	CO2	PO7
		generation using thermal power plant.				
	b)	Explain the significance of power factor and enumerate the	4 Marks	L2	CO2	PO1
		methods of improving the power factor.				
	c)	Explain the significance of Energy Efficiency ratio.	3 Marks	L2	CO2	PO8

	UNIT-III				
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)				
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
	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
a)	(UK) Distinguish hatwaan Half waya Paatifian and full waya reatifian	7 Mortra	12	CO4	DOJ
a)	What is the need for biasing in transistor operation?	7 Marks		C04	PO2
0)			L2	04	101
a) b)	Draw the block diagram of Op-Amp and explain in detail. In an inverting adder circuit, the input voltages ate 0.3 V, 0.5 V, 0.1 V while $R_1=R_2=R_3=1$ K $\Omega$ . If $R_f=10$ K $\Omega$ , calculate the output voltage	7 Marks 7 Marks	L2 L2	CO4 CO4	PO1 PO2
	(OR)				
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
	<ul> <li>a)</li> <li>b)</li> <li>a)</li> <li>b)</li> <li>a)</li> <li>b)</li> <li>a)</li> <li>b)</li> <li>a)</li> <li>b)</li> </ul>	<ul> <li><b>UNIT-III</b></li> <li>a) With neat sketch, demonstrate the working principle of single phase transformer.</li> <li>b) Explain the working principle of Three phase induction motor and mention any one application.</li> <li><b>(OR)</b></li> <li>a) Explain the constructional details of single phase capacitor start and run induction motor.</li> <li>b) Explain the working of permanent magnet DC motor and mention any one application.</li> <li><b>UNIT-IV</b></li> <li>Explain the operation of a PN junction diode in forward biased and reverse biased condition. Draw its V-I characteristics.</li> <li><b>(OR)</b></li> <li>a) Distinguish between Half wave Rectifier and full wave rectifier.</li> <li>b) What is the need for biasing in transistor operation?</li> <li><b>UNIT-V</b></li> <li>a) Draw the block diagram of Op-Amp and explain in detail.</li> <li>b) In an inverting adder circuit, the input voltages ate 0.3 V, 0.5 V, 0.1 V while R<sub>1</sub>=R<sub>2</sub>=R<sub>3</sub>=1 KΩ. If R<sub>f</sub>=10 KΩ, calculate the output voltage.</li> <li><b>(OR)</b></li> <li>a) Examine and derive an expression for V<sub>0</sub> of the differentiator circuit by using Op-Amp.</li> <li>b) Define Op-Amp and list out the ideal characteristics of ideal Op-Amp.</li> </ul>	UNIT-IIIa)With neat sketch, demonstrate the working principle of single phase transformer.7 Marksb)Explain the working principle of Three phase induction motor and mention any one application.7 Marksa)Explain the constructional details of single phase capacitor start and run induction motor.7 Marksb)Explain the constructional details of single phase capacitor start and run induction motor.7 Marksb)Explain the constructional details of single phase capacitor start and run induction motor.7 Marksb)Explain the working of permanent magnet DC motor and mention any one application.7 Marksb)Explain the operation of a PN junction diode in forward biased and reverse biased condition. Draw its V-I characteristics. (OR)14 Marksa)Distinguish between Half wave Rectifier and full wave rectifier. UNIT-V7 Marksb)What is the need for biasing in transistor operation? UNIT-V7 Marksa)Draw the block diagram of Op-Amp and explain in detail. b)7 Marksb)In an inverting adder circuit, the input voltages ate 0.3 V, 0.5 V, ol.1 V while $R_1=R_2=R_3=1$ K $\Omega$ . 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UNIT-V7 MarksL2b)What is the need for biasing in transistor operation? UNIT-V7 MarksL2a)Draw the block diagram of Op-Amp and explain in detail. N 1 n an inverting adder circuit, the input voltages ate 0.3 V, 0.5 V, 0.1 V while $R_1=R_2=R_3=1$ K $\Omega$ . 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UNIT-V7 MarksL2CO4b)Draw the block diagram of Op-Amp and explain in detail. b7 MarksL2CO4b)In an inverting adder circuit, the input voltages ate 0.3 V, 0.5 V, 0.1 V while $R_1=R_2=R_3=1$ K $\Omega$ . If $R_f=10$ K $\Omega$ , calculate the output voltage.7 MarksL2CO4a)Examine and derive an expression for V <sub>0</sub> of the differentiator circuit by using Op-Amp.7 MarksL2CO4b)Define Op-Amp and list out the ideal characteristics of ideal Op-Amp.7 MarksL2CO4

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PO7

## SREE VIDYANIKETHAN ENGINEERING COLLEGE

Roll No.

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

matrix composites. Also discuss its effect on environment.

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	CODE	No.: 20BT10341		SVEC-20		
		Roll No.				
		SREE VIDYANIKETHAN ENGINEERING CO				
		I B.Tech I Semester (SVEC-20) Supplementary Examinatio	ns Septem	ber –	2021	
		BASIC CIVIL AND MECHANICAL ENGINEE	RING			
		[ Electrical and Electronics Engineering, Electronics and Comm	unication <b>E</b>	nginee	ring,	
	<b>T</b> .	Electronics and Instrumentation Engineerin	g ]			-0
	Time: 3	hours Answer One Ouestion from each Unit		Max.	Marks:	70
		All questions carry equal marks				
1.	a)	Convert the following whole circle bearings to quadrantal bearings:	6 Marks	L4	CO1	PO1 PO2
		i) 22°30' ii) 50°40' iii) 120° iv) 170°12' v) 211°54' vi) 327°24'				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
	b)	Define the following:	8 Marks	L1	CO1	PO6 PO1
		1) Stress. ii) Strain. iv) Hooke's law. 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
1	a)	(OR)	7 Marka	1.2	CO1	
4.	a)	Explain the components of a starts with heat sketch.	/ WIAIKS	LZ	COI	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
6.		(OR) 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
0	``	(OR)	$\overline{a}$	T 1	000	DO 1
8.	a) b)	List the types of gear trains and explain. Derive the expression for power transmitted by the simple gear train.	7 Marks 7 Marks	L1 L2	CO2 CO2	PO1 PO1 PO2
6		UNIT-V		* -	<u> </u>	D.C.
9.	<b>`</b>	write a short note on soldering and brazing processes. (OR)	14 Marks	L2	CO2	POI
1(	J	Give an illustrative explanation of milling process and explain its	14 Marks	L2	CO2	POI
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 List the data types of C Language. Explain with a neat syntax. 1. a) 7 Marks L2 CO1 **PO1** Compare operator precedence and associativity. Demonstrate 7 Marks L2 CO1 **PO2** b) with a suitable example. (**OR**) 2. Explain the operators of C Language. 7 Marks L2 CO1 **PO1** a) Write a C program to swap the values of two variables without b) 7 Marks L3 CO1 PO<sub>3</sub> using a third variable. UNIT-II ) 3. Demonstrate the looping statements with a suitable example. 7 Marks L2 CO1 PO1 a) Write a C program to find the sum of individual digits of a CO1 b) 7 Marks L3 PO3 positive integer. (**OR**) Define algorithm. Design an algorithm to check whether a 7 Marks L2 CO<sub>2</sub> **PO3** 4. a) number given by the user is odd or even. Explain the top-down design technique for solving the given b) 7 Marks L2 CO<sub>2</sub> PO5 problem. UNIT-III) Write a C program to find the second largest number in a list of 7 Marks CO3 PO3 5. a) L2 integers. b) Write a C program to generate the prime numbers between 1 and 7 Marks L3 CO3 PO<sub>3</sub> *N*. Define a separate function to generate prime numbers. (OR)6. Compare and contrast automatic, external and static variables. 7 Marks L2 CO3 **PO2** a) Write a C program to insert a sub-string in to a main string at a b) 7 Marks L3 CO3 PO3 given position. UNIT-IV Write a C program using pointers to read in an array of integers 7. a) 7 Marks L2 CO3 PO1 and print its elements in reverse order. Compare static and dynamic memory allocation. Describe b) 7 Marks L3 CO3 **PO2** dynamic memory allocation functions. (**OR**) Differentiate call-by-value and call-by-address with a suitable C 8. 7 Marks L2 CO<sub>4</sub> **PO2** a) program. b) Write a C program to count the number of vowels and 7 Marks L3 CO<sub>4</sub> PO<sub>3</sub> consonants in a string using pointers.

# UNIT-V

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

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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				
1.	a) b)	Find the Conjunctive normal form of $\sim (PVQ) \leftrightarrow (P \lor Q)$ . Is $[(P \to R) \land (Q \to R)] \to [(P \lor Q) \to R]$ a Tautology or not? Justify	7 Marks 7 Marks	L3 L4	CO1 CO1	PO3 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) $(P \neq R) \land (\sim Q \rightarrow S)$ . ii) $(P \lor (Q \rightarrow (R \land \sim P))) \neq (Q \lor (\sim S))$	7 Marks	L3	CO1	PO3
		$(1 \lor (Q \lor (R \land (-1))) \leftarrow (Q \lor (-3))$				
2	a)	Give an example for symmetric antisymmetric compatibility	7 Marka	τ2	$CO^{2}$	DOJ
5.	<i>a)</i>	and transitive relations.	/ WIAIKS	LJ	002	102
	b)	Determine the value of fog, gof, f <sup>1</sup> og and g <sup>-1</sup> of <sup>1</sup> for the functions	7 Marks	L3	CO2	PO7
		f and g defined by $f(x) = x^2 - 2$ , $g(x) = x + 4$ where R $\rightarrow$ R (set of real numbers).				
		(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 $(z_6, +6)$ . (OR)	7 Marks	L3	CO3	PO2
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 $a, b \in G$ 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

8.	a)	Solve the Recurrence Relation		7 Marks	L2	CO4	PO4
		$a_n - 9a_{n-1} - 26a_{n-2} - 24a_{n-3} = 0$ where $a_0 = 0$ , $a_1 = 1$ and	$a_2 = 10.$				
	b)	Compute the number of six letter combinations of the	he letter of	7 Marks	L3	CO4	PO2
	,	English alphabet. If no letter is to appear in the co	ombination				
		more than 2 times.					
		UNIT-V					
9.	a)	Define the following with examples:		8 Marks	L2	CO5	PO1
	,	i) Graph. ii) Degree of a vertex.					
		iii) Complete Graph. iv) Sub Graph.					
	b)	Write a short note on:		6 Marks	L2	CO5	PO4
		i) Euler circuit. ii) Hamiltonian circuit.					
		(OR)					
10	a)	Show that a tree with <b>n</b> vertices has exactly (n-1) edge	S.	7 Marks	L4	CO5	PO2
	b)	Show that the K <sub>7</sub> has Hamiltonian graph. How I	many edge	7 Marks	L4	CO5	PO2
		disjoint Hamiltonian cycles are there in $K_7$ ?	, ,				

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### **SREE VIDYANIKETHAN ENGINEERING COLLEGE**

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

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SVEC-16 Roll No.

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

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#### 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

- a) Four samples of water are collected at Naravari Palli (NP), Pullaiahgari Palli 8 Marks (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<sub>3</sub> 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.
  - b) Fluorides in water. Discuss effects on human Health and Nalgonda technique for 6 Marks deFluoridation of water.

#### (**OR**)

- a) Rishika want to investigate the reason for unforeseen explosion of Home boiler. 8 Marks After explosion the following deposits were found on analysis of boiler pieces. CaSO<sub>4</sub>, CaSiO<sub>3</sub>, MgSiO<sub>3</sub>, Fe<sub>2</sub>O<sub>3</sub>, Mg(OH)<sub>2</sub>, Na<sub>2</sub>FeO<sub>2</sub>, CaCO<sub>3</sub>. 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?
  - b) Write the chemistry of estimation of Water hardness by EDTA method? Discuss 6 Marks why PH = 10 is to be maintained.

#### 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	10 Marks
		of Green Chemistry.	
	b)	Illustrate disadvantages of Nanomaterials.	4 Marks
		UNIT-IV	
7	a)	Distinguish Electrolytic cell and Electrochemical cell with neat diagrams and	10 Marks
		explain their in house and Industrial applications in your everyday life.	
	b)	Explain the significance of the title of this outcome, "Energy from Electron	4 Marks
		Transfer."	

- 8 a) Using values from the table of standard reduction potentials, calculate the cell 6 Marks potentials,  $\nabla G$  and log K under standard conditions of the following cells.
  - i)  $Al(s)/Al^{3+}(aq)//Ag^{+}(aq)/Ag(s)$
  - ii)  $Zn(s)/Zn^{2+}(aq)//Cr^{3+}(aq)/Cr(s)$
  - iii)  $Fe(s)/Fe^{2+}(aq)//Hg^{2+}(aq)/Hg(l)$
  - b) Identify the type of battery that is truly the power behind everyday life. They 8 Marks 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.

#### (UNIT-V)

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

#### (**OR**)

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

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#### 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

## Answer One Question from each Unit

Max. Marks: 70

### All questions carry equal marks

### UNIT-I

- a) With the help of suitable diagram, explain the principle, construction and 10 Marks working of an optical fiber as a wave guide.
  b) In an optical fibre, the material has refractive indices of core and cladding of 1.6 4 Marks
  - and 1.3 respectively. What is the value of critical angle? Also calculate the acceptance angle and acceptance cone.

#### (OR)

- 2 a) Classify the different types of optical fibers.
  - 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.
  b) Derive time independent Schrodinger's wave equation for a free particle.
  (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.b) What is the principle of LED? Describe the construction and working of LED.6 Marks8 Marks

#### (**OR**)

- 6 a) Explain the ac frequency dependence of different polarizability in dielectrics.
  b) Explain ionic and orientation polarization.
  5 Marks
  9 Marks
  - UNIT-IV

7 a) Define:

8

9

a)

....

4 Marks

7 Marks

7 Marks

10 Marks

i) Super conductor. ii) Critical temperature. iii) Cooper pair.b) Explain penetration depth in superconductivity. Write any five applications of 10 Marks superconductors.

### (OR)

- Explain the BCS theory of superconductivity.
- b) Explain Josephson effects and their applications.

### UNIT-V

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

#### (OR)

10 a) Define nanomaterial. Give the classification of nanomaterials.
b) Discuss the synthesis of nanomaterial by using pulsed laser deposition method.
List the applications of nanomaterials in various fields of science and technology.

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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

14 Marks

#### **Answer One Ouestion from each Unit** All questions carry equal marks

### UNIT-I

1  $x \sin x$  as a cosine series in  $(0, \pi)$  and 14 Marks Obtain the Fourier expansion of hence show that  $\frac{1}{1.3} - \frac{1}{3.5} + \frac{1}{5.7} - \dots = \frac{1}{4}(\pi - 2)$ . (OR)  $\begin{bmatrix} \frac{1}{x} - x & if \quad 0 < x < 1 \end{bmatrix}$ 

2

5

a)

Expand 
$$f(x) = \begin{cases} \frac{1}{4} - x, y & 0 < x < \frac{1}{2} \\ x - \frac{3}{4}, if & \frac{1}{2} < x < 1 \end{cases}$$
 as a **UNIT-II**

Using convolution theorem, evaluate  $L^{-1}\left(\frac{s}{(s^2+a^2)^2}\right)$ .

3 Show that inverse finite Fourier sine transform of 14 Marks  

$$F_{s}(n) = \frac{1}{\pi} \left\{ 1 + \cos n\pi - 2 \cos \frac{n\pi}{2} \right\} \text{ is } f(x) = \left\{ \begin{array}{c} 1, & 0 < x < \pi / 2 \\ -1, & \pi / 2 < x < \pi \end{array} \right.$$
(OR)
$$e^{-ax} \qquad 14 \text{ Marks}$$

Find the Fourier sine and cosine transforms of  $f(x) = \frac{e^{-ax}}{x}$  and deduce that 14 Marks  $\int_{-\infty}^{\infty} \frac{e^{-ax} - e^{-bx}}{r} \sin sx dx = \tan^{-1}(s/a) - \tan^{-1}(s/b).$ 

### UNIT-III)

7 Marks

Fourier series of sine terms.

- **b**) Using Laplace Transform method solve ( $D^2 + 1$ )y = sin t sin 2t, t > 0, 7 Marks if y = 1, Dy=0 when t = 0.
- (**OR**) Find the inverse transform of (i)  $\log(\frac{s+3}{s+4})$  and (ii)  $\cot^{-1} s$ . 6 7 Marks a)

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 7 Marks  
 $y'(0) = y''(0) = 2$ .

### UNIT-IV

- 7 Write the initial value theorem and using it find  $u_1$ ,  $u_2$ a) 7 Marks from  $U(z) = \frac{4z^2 + 5z + 14}{(z-1)^4}.$ 
  - Find by applying the properties of Z transforms b) 7 Marks (i)  $Z[na^n]$  and (ii)  $Z[n^2a^n]$ .

#### (**OR**)

- Apply shifting theorem, evaluate  $Z[\cos(n+1)\theta]$ . 8 7 Marks a)
  - Applying Z-transforms, solve the difference equation  $u_{k+2} 2u_{k+1} + 3u_k = 2^k$ b) 7 Marks with  $u_0 = 2$ ,  $u_1 = 1$ .

### UNIT-V

9 The points of trisection of a tightly stretched string of length l with fixed ends 14 Marks 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.

(OR) Solve the linear differential equation  $(x^2 - yz) p + (y^2 - zx) q = z^2 - xy$ . 10 7 Marks a) Solve the equation  $x^2 \frac{\partial u}{\partial x} + y^2 \frac{\partial u}{\partial y} = 0$  by applying method of separation of 7 Marks b) variables.

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

**BUILDING MATERIALS AND CONSTRUCTION TECHNOLOGY** [Civil Engineering]

Tim	Fime: 3 hours Answer One Question from each Unit All questions carry equal marks		
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
5		Describe the types of het relied steel sections and cold formed steel sections	14 Mortza
5		(OR)	14 IvialKS
6		Associate the various uses of aluminum with respect to construction works.	14 Marks
7	``		$7 \times (1)$
1	a)	Define bearing capacity and safe bearing capacity of the soil. Sketch the	e / Marks
		i) Grillage Foundation ii) PCC Paft Foundation	
	h)	List the classification of stone masonry with neat sketches. Show any four joint	s 7 Marks
	0)	in stone masonry	
		(OR)	
8	a)	Write a short notes on:	7 Marks
		i) Cavity walls. ii) Partition walls.	
	b)	Why brick masonry is preferred over stone masonry?	7 Marks
9	a)	Explain briefly	7 Marks
,	u)	i) Stucco plastering. ii) Lath plastering.	, mains
	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 o	f 7 Marks
		them.	
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Roll No.

### **SREE VIDYANIKETHAN ENGINEERING COLLEGE**

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

#### **ENGINEERING MECHANICS** [Civil Engineering, Mechanical Engineering]

Max. Marks: 70

SVEC-16

Time: 3 hours

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 3 Marks are 40 kN and 10 kN respectively, then what would be the type of two forces?
  - b) Two forces are applied as shown to a hook support. Knowing that the magnitude 4 Marks of **P** is 35 N, determine the required angle  $\alpha$ , if the resultant R of the two forces applied to the support is to be horizontal.



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



- 2 a) State and explain Lami's theorem.
  - 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.



3 Marks

5 Marks

1



### UNIT-II

- 3 a) What are the common types of supports used in two dimensions? Explain the 3 Marks support reactions with suitable sketches.
  - b) The figure shows a pin-jointed plane truss loaded at the point M by hanging a 4 Marks mass of 100 kg. Determine the load in members LN and NK of the truss.



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



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



b) A rigid **T** is made out of metal bars AB and CD as shown in figure each 1.4 m 5 Marks long and weigh 40 kg and 30 kg respectively. It is supported in to a vertical plane. Compute angle  $\alpha$  for equilibrium, subjected to a load of 500N at B.



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



5 a) Two blocks connected by a horizontal link AB are supported on two rough 7 Marks planes as shown in figure. The coefficient of friction for block A on the horizontal plane is  $\mu$ =0.4. The angle of friction for block B on the inclined plane is  $\varphi$ =15°. What is the smallest weight W of block A for which equilibrium of the system can exist?



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



(OR)

6 a) 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.



b) The 2225 N block shown in figure P-507 is in contact with 45° incline. The 6 Marks coefficient of static friction is 0.25. Compute the value of the horizontal force P necessary to

i) just start the block up the incline.

ii) just prevent motion down the incline.



- 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 6 Marks figure.



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

#### (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. 7 Marks Determine the centroid of the remaining shaded area. (All dimensions in mm).



c) State and explain Pappus-Guldinus theorems for surface of revolution and 4 Marks volume of revolution.



- 9 a) i) State impulse-momenutum priniciple.
  - 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.

4 Marks

4

- A vehicle of mass 600 kg and moving with a velocity of 12 m/s strikes another 3 Marks **b**) 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.
- A car of mass 1500 kg is uniformly accelerated. Its speed increases from 7 Marks c) 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.

#### (**OR**)

- i) A car starts from rest with a constant acceleration of 4m/sec<sup>2</sup>. Determine 10 4 Marks a) the distance travelled in the 7th second.
  - 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.
  - Two blocks of weights P and Q are connected by a flexible but inextensible cord 5 Marks **b**) and supported as shown in Fig. If the coefficient of friction between the block P and the horizontal surface is  $\mu$  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;  $\mu=1/3$ .



A man weighing 712N stands in a boat so that he is 4.5m from a pier on the c) 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.





SVEC-16 Roll No.

Max. Marks: 70

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

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

#### **BASIC ELECTRICAL AND ELECTRONICS ENGINEERING** [Civil Engineering, Mechanical Engineering]

#### Time: 3 hours

# Answer One Ouestion from each Unit.

All questions carry equal marks.

### UNIT-I

- 1 State and explain the Kirchhoff's laws with suitable examples. 7 Marks a)
  - b) Compute the equivalent resistance across AB for the network shown below. 7 Marks



(**OR**)

- 2 State and explain the terms node, loop, path with examples. a)
  - Compute the equivalent resistance across voltage source using star/delta 8 Marks b) transformation. Also compute current delivered by voltage source.



If the voltage across 2  $\Omega$  resistor V<sub>0</sub> = -5 cos 2t, Compute the source current i<sub>s</sub>. 3 7 Marks a) And also draw the phasor diagram representing source current and V<sub>0</sub>.



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



7 Marks

If  $I_s = 20 \sin (10t+15^{\circ})$  A in the circuit shown in figure, compute the current 4 a) 7 Marks

passing through capacitor i<sub>0</sub>.



b) Compute the I<sub>s</sub>(t), circuit shown in figure below. Also compute the power 7 Marks delivered by voltage source. Represent the voltage and current relations in phasor diagram.



- 5 Explain the construction of a single-phase transformer. 5 Marks a) A transformer has 600 primary turns connected to a 1.5 kV supply. Determine the 6 Marks b) number of secondary turns for a 240 V output voltage, assuming no losses. State the reason for transformer is rated in kVA not in KW. 3 Marks c) (**OR**) 6 Explain how torque is developed in DC Motor. 5 Marks a) Write the expression for the torque produced by DC Motor. 3 Marks b) A 230V motor has an armature circuit resistance of 0.6  $\Omega$ . If the full load 6 Marks c) 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. UNIT-IV 7 a) Define the transducer. 3 Marks State and explain the basic requirements of transducer. 4 Marks **b**) State and explain the principle operation of load cell. 7 Marks c) (**OR**) State the need for data acquisition system, explain the data acquisition system 8 a) 7 Marks with the help of block diagram. **b**) Explain the principle operation of LVDT with the help of neat sketch. 7 Marks UNIT-V 9 Explain the diode acting as switch. 6 Marks a) A 5:1 transformer is connected to a half wave rectifier circuit with a 50 k $\Omega$  load. 8 Marks b) Find iv)  $I_{ac}$ . In put voltage is 220  $V_{pk}$ . i) V<sub>p</sub>; ii)I<sub>D</sub>; iii) Idc; 5 : -1  $220V_{pk}$  $\mathbf{v}_1$ 50kΩ (**OR**)
- 10 a) State and explain the terms Peak Inverse Voltage (PIV), ripple factor, efficiency 7 Marks and regulation of full wave rectifier.
  - b) The circuit shown in figure had excited by sinusoidal waveform, compute the 7 Marks voltage across the load and current passing through 6.8 k $\Omega$ . Also draw the waveforms of V<sub>L</sub>, I<sub>L</sub>, V<sub>D</sub> and I<sub>D</sub>. Assume diode acting as ideal. 7



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#### 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

### 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 14 Marks biased condition. Draw its V-I characteristics.

(OR)

2 Draw the circuit of a half-wave-rectifier without filter and derive the expressions 14 Marks for ripple factor, % regulation, Efficiency and PIV.

### UNIT-II)

3 Define Early-effect; explain why it is called as base-width modulation. Discuss 14 Marks its consequences in transistors in detail.

#### (OR)

- 4 a) With reference to bipolar junction transistors, define the following terms and 7 Marks explain.
  - i) Emitter efficiency.
  - ii) Base Transportation factor.
  - iii) Large signal current gain.
  - b) How transistor acts as an amplifier?

### UNIT-III

5 Draw the circuit diagram of CC amplifier using hybrid parameters and derive 14 Marks expressions for A<sub>I</sub>, A<sub>V</sub>, R<sub>i</sub>, R<sub>o</sub>.

#### (OR)

6 Draw the circuit diagram and small signal equivalent of CB amplifier using 14 Marks accurate h-parameter model. Derive expressions for A<sub>V</sub>, A<sub>I</sub>, R<sub>i</sub> and R<sub>0</sub>.

### UNIT-IV

- 7 a) Explain the operation of FET with its characteristics and explain the different 10 Marks regions in transfer characteristics.
  - 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 14 Marks and operation of a JFET and mark the regions of operation on the characteristics.

### UNIT-V

9 Explain the tunneling phenomenon. Explain the characteristics of tunnel diode 14 Marks with the help of necessary energy band diagrams.

#### (OR)

10 Explain about :

- i) Varactor diode.
- ii) Schottky Barrier diode with necessary sketches.

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Max. Marks: 70

7 Marks

(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

1Determine the ripple factor of an L-section filter comprising a 10H choke and<br/>8μF capacitor, used with a FWR. The DC voltage at the load is 50V. Assume the<br/>line frequency as 50Hz.14 Marks

### (OR)

- 2 A full wave rectifier circuit uses two silicon diodes with a forward resistance of 14 Marks 20 $\Omega$  each. A DC voltmeter connected across the load of 1K $\Omega$  reads 55.4 volts. Calculate:
  - 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 14 Marks 10, with the following specifications:

$$V_{CC} = 16V$$
,  $V_{BE} = 0.7V$ ,  $V_{CEO} = 8V$ ,  $I_{CO} = 4$  mA and  $\beta = 50$ .

#### (OR)

- 4 a) If the base current in a transistor is  $20\mu$ A when the emitter current is 6.4mA, 8 Marks what are the values of  $\alpha$ dc and  $\beta$ dc? Also determine the collector current.
  - b) Draw the input and output characteristics of a transistor in common emitter 6 Marks configurations.

### UNIT-III)

- 5 a) A self biased p channel JFET has a pinch off voltage of  $V_P = 5$  V and  $I_{DSS}=12$  10 Marks mA. The supply voltage is 12 V. Determine the values of  $R_D$  and  $R_S$  so that  $I_D = 5$  mA and  $V_{DS} = 6$ V.
  - b) Sketch the drain characteristics of MOSFET for different values of  $V_{GS}$  and 4 Marks mark different regions of operation.

#### (OR)

- 6 a) In an n-channel FET, the effective channel width is  $3 \times 10^{-4}$  cm and the donor 8 Marks impurity concentration is 1015 electrons/cm<sup>3</sup>. Find the pinch-off voltage.
  - 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 14 Marks stability, reduce noise and increase input impedance.

### UNIT-V

9 Give the construction details of UJT and explain its operation with the help of 14 Marks equivalent circuits.

#### (OR)

10 What is the photo diode? Explain its principle of operation and applications in 14 Marks detail.

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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

4

Max. Marks: 70

7 Marks

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

### UNIT-I )

- a) Illustrate the operation of BUCKET-SORT on the array A = <79, 13, 16, 64, 39, 7 Marks 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.</li>
  - 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 7 Marks pass for an array

A = <81, 94, 11, 96, 12, 35, 17, 95, 28, 58, 41, 75, 15>

b) Trace the insertion sort algorithm with the given set of 6 numbers 44, 8, 74, 51, 7 Marks 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?

### UNIT-II

- 3 a) What is a Stack? Explain any three operations performed on a Stack with 7 Marks required algorithms.
  - b) What is enqueue and dequeue? What are the applications of Queue? Explain. 7 Marks (OR)

a) Can you write a condition to check whether the stack is full or empty?b) What is priority Queue? Explain.7 Marks

### (UNIT-III)

- 5 a) Write the structure and enqueue() / insert() function and dequeue()/delete() 7 Marks function for a linked queue.
  - b) Explain the structure of a doubly linked list. Write an algorithm for inserting 7 Marks and deleting an element from doubly linked list. Illustrate the routines with examples.

#### (OR)

- 6 a) Write functions to perform the operations of push(), pop() and search() over 7 Marks Linked Stack
  - b) Differentiate singly linked list and circularly linked list.

### UNIT-IV

- 7 a) Show the result of inserting the following keys into an initially empty 2-3 tree: 7 Marks 3, 1, 4, 5, 9, 2, 6, 8, 7, 0.
  - 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 14 Marks iii) Insert. i) Initialization. ii) Find. iv) Display.

### (OR)

- 10 a)
- Illustrate Connected Graph and Complete Graph. Give an example Write a function to compute the hash values for a specific set of keys using the 7 Marks b) division/modulo method.

7 Marks

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Max. Marks: 70

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

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#### 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

### 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 7 Marks to members of the invoking object.
  - b) Explain objected oriented concepts that are supported by a C++ program clearly 7 Marks giving the reasons why they are supported through examples.

#### (OR)

- 2 a) Define object oriented programming and explain feature of object oriented 7 Marks programming. How it is different than procedure oriented programming?
  - b) Write the general form of function. Explain the different types of argument 7 Marks passing techniques with example.

#### UNIT-II

3 a) What is the difference between global and local variables?
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 7 Marks execution?
  - b) Explain how in line function differs from pre processor macro. Explain 7 Marks significant advantages of Inline function.

### (UNIT-III)

5 a) Write a C++ program using this pointer.7 Marksb) 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
- 7 a) Write a program that assigns the memory using the copy constructors every time 7 Marks 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.
  - b) What rules do you follow when inserters and extractors are overloaded with 7 Marks reference to a class in which they are defined?

#### (OR)

- 8 a) What operators cannot be overloaded as friend operators' functions? Explain the 7 Marks reasons.
  - b) Discuss different ways using which one object can be assigned to another object 7 Marks of the same type.

### UNIT-V

- 9 a) How can define I/O specific to a class? Explain.7 Marksb) 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 7 Marks functions explain.
  - b) List different ways using which polymorphism is implemented within C++. 7 Marks

### SREE VIDYANIKETHAN ENGINEERING COLLEGE

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#### 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

3

Answer One Question from each Unit.

Max. Marks: 70

# All questions carry equal marks.

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- 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

- a) Implement EX-OR using minimum number of NAND gates.
  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 4 Marks expression  $F(x, y, z) = \Sigma(2, 3, 6, 7)$ .

#### (OR)

4 Simplify the following expression using K-map and implement with two-level 14 Marks NAND gate circuit: F = AB' + ABD + ABD' + A'C'D' + A'BC'

### (UNIT-III)

- 5 a) Show that a full-subtractor can be constructed with two half-subtractors and an 7 Marks OR gate.
  - b) A majority function is generated in a combinational circuit when the output is 7 Marks 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.

#### (OR)

- 6 a) Implement a full-adder using two half-adders and an OR gate.7 Marksb) Design a combinational circuit with three inputs and one output. The output is7 Marks
  - equal to logic 1, when the binary value of the input is less than 3. The output is logic 0 otherwise.

### 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, 7 Marks
D and T flip-flops.

#### (OR)

- 8 a) Draw the circuit of JK flip-flop using NAND gates and explain its operation.7 Marksb) What is the difference between an excitation table and a characteristic table?7 Marks
  - Give the excitation tables for SR, JK, T and D flip-flops.

### UNIT-V

9 a) Differentiate between static RAM and Dynamic RAM.
b) Show how the PLA circuit would be programmed to implement the sum and carry outputs of a full-adder.
(OR)

10 Implement the following Boolean functions using PAL:  $F_1 = \Sigma m(0, 2, 5, 7, 8, 10, 12, 13); F_2 = \Sigma m(0, 2, 6, 8, 9, 14, 15)$ 

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#### 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

#### 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 7 Marks in all its aspects? Explain your answer with all necessary chemical reactions involved.
  - b) DISCUSS deionization process of water softening with neat DIAGRAM. Give 7 Marks the chemical reactions where ever is necessary.

#### (**OR**)

2 a) Central Water Commission (CWC) of Tirupati section reports on underground 8 Marks 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  $56.24 \times 10^4 \text{ kg m}^{-2}$  boiler.

b) Discuss the role of polymers in purification of water by using advanced 6 Marks methods.

### UNIT-II

- 3 a) Discuss the synthesis, properties and applications of poly carbonates.
  b) Explain the mechanism of degradation and applications of Bio-degradable
  7 Marks
  - b) Explain the mechanism of degradation and applications of Bio-degradable / Marks polymers.

#### (OR)

- 4 a) What is self lubricating plastic? Give examples. Name some specific 5 Marks applications.
  - 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	7 Marks
		with the suitable examples.	
	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 $1.5 V.7n$ MnO.	7 Marks
,	u)	cell.	
	b)	Explain why an electronic nose, in principle can measure (identify) a very large	7 Marks

number of compounds (mixtures, smells etc) despite using a limited number of sensors.

(**OR**)

8 a) Identify the type of battery commonly used in each of these consumer electronic 7 Marks products in olden days and today. Discuss their construction and Chemistry. Assume none uses solar cells.

i) Digital Camera. ii) MP3 Player.

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 7 Marks and marine structures and explain.
  - b) How will you assess the situation and select the lubricant? Also explain 7 Marks Mechanism of Lubrication.

#### (OR)

- a) A student, in replying to an examination question, writes: 'Corrosion of metal is 10 Marks 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.
  - b) Write the qualities of a good lubricant.

4 Marks

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### 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]

Tim	e: 3 h	ours 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	4 Marks
		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.	
	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	6 Marks
		the help of energy level diagram.	
	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	6 Marks
	,	lattice.	
	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.	8 Marks
		i) LED. ii) Photo-Diode.	
	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	10 Marks
		conductivity of a doped semiconductor? Write expression for conductivity of an	
		n-type semiconductor.	
	b)	Find the electrical conductivity of intrinsic silicon whose charge concentration is	4 Marks
		1.5 x $10^{10}$ /m <sup>3</sup> and the mobility of electron and hole are $0.13$ m <sup>2</sup> /V-s and	
		0.05m <sup>2</sup> /V-s respectively.	
		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	10 Marks
		absorption coefficient.	

Suggest remedies to improve acoustics of buildings. b) 4 Marks

How is nano-world uniquely different? 9 6 Marks a) Discuss the synthesis of nano materials by pulsed laser deposition method with b) 8 Marks appropriate figures. Discuss its advantages. (OR) Discuss important concerns of material scientists in the Nano science. 10 6 Marks a) Discuss the mechanical properties of nano materials. How can these be used in b) 8 Marks

UNIT-V

#### \$P \$P \$P

different applications?

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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.

### 

1

2

4

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) Represent the modified saw toothed wave form f(x) = 0 for  $-\pi < x \le 0$ = x for  $0 < x \le \pi$  as a Fourier series and hence evaluate

 $1 + \frac{1}{3^2} + \frac{1}{5^2} + \dots - \dots - \dots$ 

### UNIT-II

3 Find the Fourier sine transform of  $e^{-ax}/x$ . 14 Marks

(OR)

14 Marks

6 Marks

Using Fourier integral representation show that  $\int_{0}^{\infty} \frac{\omega \sin x\omega}{1+\omega^{2}} d\omega = \frac{\pi}{2} e^{-x} \text{ for } x > 0.$  14 Marks

#### (UNIT-III)

5 a) Find the Laplace transform of the square wave function E(t) of period 8 Marks T = 2 defined as  $E(t) = \begin{cases} 1,0 \le t < 1\\ 0,1 \le t < 2 \end{cases}$ .

(**OR**)

b) Determine  $L[\sin^2 t]$ .

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  $Z(n \cos n\theta)$ . b)  $If U(z) = \frac{2z^2 + 3z + 12}{(z-1)^4}$ , then determine **u**<sub>3</sub>. 6 Marks 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 14 Marks u(x,t) = f(x-ct) + g(x+ct), where **f** and **g** are arbitrary twice differentiable functions.

#### (OR)

10 Solve  $\frac{\partial^2 z}{\partial x^2} + z = 0$ , given that when x = 0,  $z = e^y$  and  $\frac{\partial z}{\partial x} = 1$ . (4) Marks

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### 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. <b>(OR)</b>	14 Marks	
2	a) b)	Explain about the manufacturing methods of tile. Write about the characteristics of a good tile.	10 Marks 4 Marks	
3		Explain about the physical tests of cement.	14 Marks	
4		Explain about the strength and chemical tests of cement.	14 Marks	
		(UNIT-III)		
5	a) b)	Explain about the classification of rubber. Explain about compounding and uses of rubber.	7 Marks 7 Marks	
6	a) b)	Explain about the constituents of plastics. Write short notes about properties of plastic.	7 Marks 7 Marks	
		UNIT-IV		
7	a) b)	Brief about different types of footings. Distinguish between rubble and ashlar masonry.	7 Marks 7 Marks	
8		Discuss about different types of floors.	14 Marks	
9	a) b)	Describe in brief various types of shores. Compare timber and steel scaffolding. (OR)	7 Marks 7 Marks	
10	a) b)	Explain about the methods of underpinning. Explain about the component parts of scaffolding.	7 Marks 7 Marks	

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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 Explain free body diagram with examples. a)
  - Determine the x and y components of each of the forces shown and also find the 4 Marks **b**) resultant of all these forces.



Two identical rollers each of weight Q = 445N are supported by an inclined 7 Marks c) 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.



- 2 Distinguish among the equilibrium, resultant and equilibrant. 3 Marks a)
  - The force system shown in fig. below has a resultant of 900 N pointing up along b) positive Y axis. Find the value of F and  $\alpha$  required to give this resultant.



The top end of vertical boot is connected by two cables having tension  $T_1$ =500N c) 7 Marks and T<sub>2</sub>=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.



3 Marks

1

## UNIT-II

- 3 Distinguish between moments and couple with suitable applications. a)
  - For the loading on truss as shown in the figure, find the force in member CD. b)

R D L L L E 1 kN 1 kN

The diameters of the two steps of the pulley of a Weston's differential pulley c) 7 Marks 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.



- Explain concept of virtual work with suitable example. 4 a)
  - 3 Marks Consider a truss PQR loaded at P with a force F as shown in the figure. Find the b) 4 Marks tension in the member QR.



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



3 Marks 4 Marks
# UNIT-III

5 a) If the coefficient of friction are known to be  $\mu_s = 0.30$  and  $\mu_k = 0.25$  between all 8 Marks 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.



b) The block A shown in figure weighs 2000N. The cord attached to if passes over 6 Marks 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 a) What is the least value of P in the system shown in figure to cause the motion to 7 Marks impend? Assume the pulley is smooth and coefficient of friction between the other contact surfaces is 0.2.



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



- 7 a) What are the centroidal coordinates of a quarter circular area placed in second 3 Marks quadrant of coordinate system?
  - 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



- 8 a) Explain the concept of mass moment of inertia. What is the relation between 3 Marks area moment of inertia and mass moment of inertia?
  - b) Referring to the figure, determine the coordinates  $x_c$  and  $y_c$  of the center of a 7 Marks 100mm diameter, circular hole cut in a thin plate so that this point will be the centroid of the remaining shaded area.



c) Compute the moment of inertia of the composite area about the x-axis.

4 Marks



#### UNIT-V 9 i) State law of conservation of momentum. 4 Marks a) 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. A 10 gm bullet is shot horizontally in a wood block of mass 1 kg. The bullet gets 3 Marks b) embedded in the block and the block is displaced on a rough horizontal table $(\mu=0.2)$ through 1 m. What was the velocity of bullet? A man of mass 75 kg and a boy of mass 25kg drive off the end of a boat of the 7 Marks c) 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. (**OR**) 10 (i) An elevator is required to lift a body of mass 65 kg. Find the acceleration of 4 Marks a) the elevator, which could cause a pressure of 800 N on the floor. (ii) Anelevatorweighing100 kN attains an upward velocity of 4m/s in two seconds with uniform acceleration. What would be the tension in the cable? The wheel of a small gyroscope is set spinning by pulling on a string wound 3 Marks b)

- b) The wheel of a small gyroscope is set spinning by pulling on a string wound 3 Marks around the shaft. Its moment of inertia is I=5562.5 kg-mm<sup>2</sup> 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?
- c) Two weights P and Q are connected by the arrangement shown in figure 7 Marks 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.





4 a) Compute the Z<sub>in</sub>, circuit shown below.



b) Determine the  $Z_f$  and I circuit shown below.



- 5 State the applications of three phase induction motors. Also state the salient 7 Marks a) features of three phase induction motors.
  - b) A single-phase 800V/100V, 50Hz transformer has a maximum core flux density 7 Marks of 1.294 T and an effective cross-sectional area of  $60 \text{ cm}^2$ . Calculate the number of turns on the primary and secondary windings.

#### (**OR**)

- 6 Make use of Faraday's law derive the equation for the EMF induced in a DC 5 Marks a) machine.
  - b) State the applications of DC compound motors.
  - 3 Marks A 4-pole, 440V shunt motor takes 8A on no load, the no load speed being 6 Marks c) 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  $0.25\Omega$ . Neglect armature reaction.

# UNIT-IV)

7 Explain the operation of ammeter using block diagram. 7 Marks a) State the instrument measures the thickness of conductor; explain the procedure b) 7 Marks to measure the same

### (**OR**)

- 8 a) State the difference between stain gauge and load cell. 7 Marks State and explain the method of current measurement by passive method. b) 7 Marks UNIT-V
- 9 How the transistor act as an amplifier? Explain. a)
  - Derive the current gain of common emitter configuration transistor amplifier 7 Marks b) using voltage divider biasing.

### (**OR**)

- 10 State the difference between diode and transistor, as both are semiconducting a) 7 Marks switches.
  - **b**) State the need for amplifier in electronic circuits. Explain how a NPN Transistor 7 Marks act as amplifier.

69 68 (A) 7 Marks

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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	7 Marks
		resistance if $C = 600 \mu F$ , $T = 20$ ms, $V_r = 1.2$ V and $V_{dc} = 9V$ .	
		(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 $\beta$ =50 in self biasing arrangement with the following component values V <sub>CC</sub> = 20V, R <sub>C</sub> = 2K\Omega, R <sub>E</sub> = 100Ω, R <sub>1</sub> = 100KΩ, R <sub>2</sub> = 5KΩ. Also find the stability factor	8 Marks
	h)	Derive the expression for S' in self-bias arrangement	6 Marks
	0)		0 WILLING
5	a)	$\Delta$ CE amplifier is driven by a valtage severe of internal register as $R = 2000$ and	0 Marks
5	a)	A CE amplifier is driven by a voltage source of internal resistance $R_s = 80052$ and	9 WIAIKS
		the load impedance $R_L = 1000\Omega$ . The n-parameters are $h_{ie} = 1K\Omega_2$ , $h_{re} \gtrsim 10^{\circ}$ ,	
		$h_{fe}$ =50 and $h_{oe}$ = 25µA/V. Compute the current gain A <sub>I</sub> , input resistance R <sub>i</sub> ,	
	1 \	voltage gain $A_V$ and output resistance $R_0$ using exact analysis.	5 ) ( 1
	b)	Determine the h-parameters for common emitter configuration from the characteristic curves.	5 Marks
c.		(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	8 Marks
	• `	derive the equations for voltage gain, input, impedance and output impedance.	
	b)	Define $g_m$ , $r_d$ and $\mu$ and derive the relationship among them. (OR)	6 Marks
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, $R_D = 4 \text{ k} \Omega$ , $R_S = 2 \text{ k} \Omega$ , $g_m = 2 \times 10^{-3} \Omega$ , $r_d$	6 Marks
		= 40 k $\Omega$ . Calculate voltage gain, input impedance and output impedance.	
		UNIT-V	
9		What is a varactor diode? Briefly explain the working of it with the help of V-I	14 Marks
		characteristics and circuit symbol equivalent.	
		(OR)	
10		Draw the equivalent circuit and V-I characteristics of UJT and explain it.	14 Marks
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SVEC-16

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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**

Answer One Question from each Unit. All questions carry equal marks. UNIT-I List out the merits and demerits of bridge type full wave rectifier over centre 1 a) 5 Marks tapped type full wave rectifiers. The secondary voltages of centre tapped transformer are given as 60V-0V-60V. 5 Marks b) The total resistance of secondary coil and forward diode resistance of each section of transformer secondary is 62  $\Omega$ . Compute the following for a load resistance for 1K  $\Omega$ i) Average load current. ii) Percentage load regulation. iii) Rectifier efficiency. What is Bleeder resistance in L Section Filter? 4 Marks c) (**OR**) Explain the operation of Tunnel Diode with neat sketches. 14 Marks UNIT-II ) Taking the example of CE amplifier, explain the criterion for selection of a 10 Marks a) suitable operating point and factors affecting its stability hence define stability factor. In a transistor determine the alpha if collector current is 4.9mA and emitter 4 Marks b) current is 5mA. (**OR**) Explain the methods of stabilising Q point of atransistor. 10 Marks 4 a) A transistor has alpha=0.98. If emitter current of the transistor is 1mA. **b**) 4 Marks Determine the base current and gain factor beta. (UNIT-III) Explain how the transfer characteristics of an Enhancement MOSFET differ a) from that of Depletion MOSFET. Define rd ad Gm. b) 4 Marks (**OR**) Draw the drain characteristics of depletion mode MOSFET. Explain different 6 a) 10 Marks operating regions. How does MOSFET differs from JFET? 4 Marks **b**) ( UNIT-IV ) State and briefly explain Barkhausen criterion for oscillation. 7 8 Marks a) Explain the main difference between an amplifier and an oscillator. 6 Marks b) (**OR**) Draw the circuit of Hartley oscillator and explain its working. Derive the 8 10 Marks a) expression for frequency of oscillation and condition for starting of oscillation. 4 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.

Max. Marks: 70

# Time: 3 hours

- 2
- 3
- 5 10 Marks

# UNIT-V

- 9 Explain the terms:
  - i) Peak point voltage.

  - ii) Valley point voltage of a UJT.iii) Mention some of the application of UJT.

# (OR)

- Explain the two transistor analogy of an SCR. 10 a)
  - Once the SCR is triggred, the gate looses its control. Explain. b)

\} (f) (F) 14 Marks

10 Marks 4 Marks

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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

# 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

- 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 7 Marks sorted subarray A  $[0 \dots p 1]$ . We can use a binary search instead to improve the overall worst-case running time of insertion sort to  $\Theta(n \log n)$ . Write routines to implement it.

#### (**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, 7 Marks and why not? Write linked list version of any sorting algorithm.

### (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 7 Marks is implemented using an array. Simulate insertion and deletion to the queue and display a graphical representation of queue after every operation

### (UNIT-III)

- 5 a) What are the advantages of linked implementation of stack over array 7 Marks implementation?
  - b) Outline an algorithm to merge two ordered singly linked lists of integers into one 7 Marks ordered list.

### (**OR**)

- 6 a) Write the peek()routine to implement stack ADT using Arrays. How does a stack 7 Marks implemented using a linked list differs from a stack implemented using an array?
  - b) Write the routines to implement linear queue using Linked lists which reads an 7 Marks integer and prints its digits in reverse order.

### (UNIT-IV)

- 7 a) Create B-tree of order 4 (t = 2) created by inserting the following data arriving in 7 Marks sequence  $\langle 92, 24, 6, 7, 11, 8, 22, 4, 5, 16, 19, 20, 78 \rangle$ .
  - b) Write a C function to insert an element into an AVL tree with single and double 7 Marks rotations.

#### (**OR**)

Max. Marks: 70

7 Marks

8 Write the insert (), delete () and find () routines for a binary search tree. What 14 Marks are the running times of your routines? Write an algorithm that counts the number of nodes in a binary tree.

# UNIT-V

9 a) In a Graph, define path, closed path and simple path with an example
b) Draw the complete undirected graphs on one, two, three, four and five vertices.
7 Marks
7 Prove that the number of edges in a *n* vertex complete graph is *n*(*n* - 1)/2.

### (OR)

10 Show the result of inserting keys  $\{89, 18, 49, 58, 69\}$  into a open addressing table 14 Marks 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.

i) 
$$f_{(i)} = i$$
. ii)  $f_{(i)} = i^2$ . iii)  $f_{(i)} = i^*h_2(x)$ .

Let the table have 10 slots and  $h_2(x) = 7 - (x \mod 7)$ .

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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

7

Max. Marks: 70

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

### UNIT-I

- Compare and contrast C and C++ through 3 similarities and 3 dissimilarities 1 7 Marks a) citing the example. What is inheritance? Are the private variables of parent class can be inherited into b) 7 Marks a child class? Explain with an example. (OR)2 What is name space and what location in the C++ program are they defined? 7 Marks a) In what way structures in C are different from structures in C++? Develop a 7 Marks **b**) structure in C++ that encapsulate attributes of an entity which is a "purchase order" UNIT-II ) 3 What is recursion? Write an application program to find factorial using recursion. 7 Marks a) Explain about storage class in C++. 7 Marks b) (**OR**) What is the difference between Void, Boolean and I/O functions? 4 7 Marks a) Differentiate between data types and derived data types. 7 Marks b) (UNIT-III) With an example, explain nested selection statements. 5 a) 7 Marks Write a program to copy string to other without using in-built function. 7 Marks b) (**OR**)
- Differentiate between passing by reference and passing by constant reference. 7 Marks 6 a) Write a program to swap two numbers using pointers. b) 7 Marks

### (UNIT-IV)

"Template functions are implicitly overloaded". Justify. 7 Marks a) How will you be able to take control when a system based exception occurs and 7 Marks b) avoid terminating your program when such exception takes place?

#### (**OR**)

- Explain the difference that exists in passing objects, pointers to the objects and 8 7 Marks a) references to the objects as function arguments.
  - What are the limitations of overloading an [] operator? Justify the uses of [] 7 Marks b) operator overloaded function.

# UNIT-V

- What are polymorphic classes? Explain how polymorphism is implemented using 9 7 Marks a) such classes.
  - Explain the way dynamic polymorphism is implemented with the help of an 7 Marks b) example program (A pointer to a parent object can hold the object of either the parent or the child).

### (**OR**)

- In what way member functions are different from manipulator functions which 10 7 Marks a) are meant for undertaking the formatted I/O? Show the difference through an example.
  - Explain the way ambiguities resolve in the Hydride Inherence. b)

SVEC-16

7 Marks

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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]

Tim	e: 3 h	Durs 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	4 Marks
	,	algebra.	
	c)	Draw the logic diagram from the simplified expression and compare the total	4 Marks
		number of gates with the diagram of part (a)	
		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	14 Marks
		4 bit addition with neat diagrams.	
		(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	4 Marks
		to the right with the serial input being 101101. What is the content of the register	
	1 \	after each shift?	10 14 1
	b)	Design a synchronous BCD counter with 1 flip-flops.	10 Marks
0	2)	(UK) Draw the sirewit of 2 hit Johnson counter Explain its energian by platting the	7 Mortes
0	a)	output waveforms	/ Wialks
	h)	Design a counter with the repeated binary sequence: 0 1 3 7 6 4	7 Marks
	5)	Use T flip-flops and if the counter enters any invalid state the next state must	/ 1/10/103
		be 0.	

# UNIT-V

- 9 a) Compare PROM, EPROM, EEPROM.
  - b) Design a combinational circuit using a ROM. The circuit accepts a 3 bit number 8 Marks and generates an output binary number equal to the square of the input number. (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.

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6 Marks

14 Marks

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# 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	
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	
2	``			т.а	001	DO 1	
3.	a) b)	What is fermentation? Explain its process and industrial	4 Marks 8 Marks	L2 L2	CO1 CO2	PO1 PO3	
		applications.					
4.	a)	Explain the factors affecting enzyme reaction and its industrial	7 Marks	L2	CO2	PO3	
	b)	Show the structure and functions of DNA.	5 Marks	L2	CO2	PO1	
~	``			т о	000	DO 1	
5.	a) b)	Summarize Mendel's single gene disorders. What is Genetic code? Explain translation process with a neat	6 Marks 6 Marks	L2 L1	CO2 CO2	PO1 PO1	
		ulagram.					
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	Ll	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. (OR)	6 Marks	L1	CO3	PO1	
10		Label the human digestive system features with neat diagram and write their functions.	12 Marks	L1	CO1	PO1	

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Max. Marks: 60

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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 How Newton's rings are formed? Derive an expression for the 1. a) 8 Marks L3 CO1 **PO2** wavelength of source using Newton's ring experiment. In a Newton's rings experiment the diameter of the 15<sup>th</sup> ring was b) 4 Marks L3 CO1 PO<sub>2</sub> 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. (**OR**) 2. Summarize the theory of Quarter wave plate and Half wave plate. L2 CO1 PO1 6 Marks a) Describe the construction and working of a Nicol's Prism. 6 Marks L2 CO1 b) PO1 ( UNIT-II ) Explain the physical significance of Maxwell's equations. 3. a) 4 Marks L2 CO<sub>2</sub> PO1 Derive the free space electromagnetic wave equations and show L3 CO2 b) 8 Marks PO<sub>2</sub> that the velocity of the electromagnetic wave is $\sqrt{\mu_0 \varepsilon_0}$ . (**OR**) Define acceptance angle. Derive an expression for acceptance 4. 8 Marks L3 CO<sub>2</sub> PO1 a) angle and numerical aperture of an optical fiber. **PO2** b) List the applications of optical fibers in various fields of 4 Marks CO2 PO1 L1 engineering. (UNIT-III) 5. Explain the concepts of drift and diffusion in semiconductors. L2 a) 6 Marks CO3 **PO1** Derive an expression for drift and diffusion currents in CO3 b) 6 Marks L3 PO<sub>2</sub> semiconductors. (**OR**) Explain construction and working mechanism of a semiconductor CO3 PO1 6. a) 8 Marks L2 diode laser. Predict the color of light emitted by a laser source made up of 4 Marks L3 CO3 PO<sub>2</sub> b) GaAs with band gap of 1.44 eV. UNIT-IV What is Piezoelectricity? Explain. CO<sub>4</sub> 7. a) 6 Marks L2 PO1 Outline electronic, ionic and orientation polarizations. CO4 PO1 b) 6 Marks L2 (OR)State magnetic moment. Explain the origin of magnetic moment 8. 6 Marks L2 CO4 PO<sub>2</sub> a) in an atom. Differentiate the hard and soft magnetic materials based on L2 CO<sub>4</sub> **PO1** b) 6 Marks hysteresis.

# UNIT-V

9.	a)	Explain Meissner's effect. How is it used to classify Type-I and	8 Marks	L2	CO5	PO1
		Type-II superconductors?				
	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	6 Marks	L2	CO5	PO1
		nanomaterials.				

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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]

Ti	Time: 3 hours Answer One Question from each Unit			Max	Max. Marks: 60		
		An 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 $\pi$ molecular orbital representations of Butadiene.	4 Marks	L2	CO1	PO1	
		(OR)					
2.	a)	N <sub>2</sub> molecule is more stable than O <sub>2</sub> molecule. How can you utilize the molecular orbital theory in supporting this statement?	8 Marks	L1	CO1	PO1	
	b)	Identify the shape of SO <sub>2</sub> , PCl <sub>5</sub> , NH <sub>3</sub> , SF <sub>4</sub> molecules using VSEPR theory.	4 Marks	L3	CO1	PO2	
		UNIT-II					
3.	a)	A ground water sample has the following composition: $Ca(HCO_3)_2 = 16.2 \ ppm \ Mg(HCO_3)_2 = 14.6 \ ppm$	6 Marks	L3	CO2	PO2	
		$MgCl = 9.5 ppm, MgSo_4 = 12.0 ppm, CaSo_4 = 13.6 ppm$ .					
	b)	Calculate carbonate and non-carbonate hardness of water. 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 $H_2O_2$ 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 <sub>4</sub> at 25°C (E° Zn/Zn <sup>2+</sup> = 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. (OR)	6 Marks	L1	CO4	PO1	
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

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9. Define lubricant. Explain the properties of the lubricant and their 12 Marks L2 CO5 PO1 significance.

# (OR)

Describe the Bergius method with a neat diagram and write the advantages, disadvantages of synthetic petrol. 10 12 Marks CO5 L2 PO1

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#### 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

5.

Max. Marks: 60

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

# UNIT-I

1. 6 Marks L1 CO1 PO1 a) Find the Fourier series of the function  $f(x) = x + x^2 in$  (0,3). Applying Fourier integral theorem. b) show that 6 Marks L3 CO1 **PO2**  $e^{-x}\cos x = \frac{2}{\pi}\int_{0}^{\infty}\frac{\lambda^{2}+2}{\lambda^{4}+4}\cos\lambda xd\lambda.$ 

#### (**OR**)

- 2. a) Find the half-range sine series of 6 Marks L1 CO1 PO1  $f(x) = \begin{cases} \frac{1}{4} - x, & 0 < x < \frac{1}{2} \\ x - \frac{3}{4}, & \frac{1}{2} < x < 1 \end{cases}$ in  $0 \le x \le 1$ 
  - b) Find the Fourier cosine transform of  $f(x) = e^{-ax}$ , a > 0 and 6 Marks L1 CO1 PO1 hence deduce the integral  $\int_{0}^{\infty} \frac{\cos px}{a^{2} + p^{2}} dp$

3. a) Determine 
$$L\{f(t)\}$$
 where  $f(t) = t^2 e^{-3t} \sin 2t$ .  
b) Find the Laplace transform of  $\int_{0}^{t} \frac{1 - e^{-t}}{t} dt$ .  
6 Marks L3 CO1 PO1  
6 Marks L1 CO1 PO1

4. a) (OR) 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 6 Marks L1 CO1 PO2 function defined by  $f(t) = \begin{cases} \sin \omega t, & 0 < t < \frac{\pi}{\omega} \end{cases}$ 

a)  
Find the inverse Laplace transform of 
$$\frac{s+2}{(s^2+4s+5)^2}$$
.  
b)  
Applying convolution theorem, evaluate  $L^{-1}\left[\frac{s^2}{(s^2+a^2)(s^2+b^2)}\right]$ .  
6 Marks L1 CO1 PO1  
6 Marks L3 CO1 PO2

(**OR**)

6. Apply Laplace transform technique to solve 12 Marks L3 CO1 PO2  $(D^2 - 2D + 1)x = e^t$ , if x(0) = 2, x'(0) = -1.

(UNIT-IV)

- 7. Show the sum of the Eigen values of the matrix 12 Marks L2 CO2 PO1  $\begin{bmatrix} 7 & 2 & 2 \\ 2 & 4 & 2 \end{bmatrix}$ 
  - $A = \begin{bmatrix} -6 & -1 & 2 \\ 6 & 2 & -1 \end{bmatrix}$  is equal to the trace of the matrix and

product of the Eigen values equal to its determinant.

#### (OR)

- 8. a) Solve the system of linear equations 6 Marks L3 CO2 PO1 5x+3y+7z=4, 3x+26y+2z=9, 7x+2y+10z=5.
  - b) Change the quadratic form  $3x^2 + 5y^2 + 3z^2 2xy + 2xz 2yz$  to 6 Marks L2 CO2 PO1 sum of squares form by an orthogonal transformation.

### UNIT-V

9. Suppose  $T: \mathbb{R}^2 \to P_1$  is a linear transformation such that 12 Marks L1 CO2 PO2  $T\begin{bmatrix}1\\1\end{bmatrix} = 2 - 3x + x^2$  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<sub>2</sub> is a vector space of polynomials of degree at most two over R.

### (OR)

- 10 a) Show that the set  $\{1+x, x+x^2, 1+x^2\}$  forms a basis for the vector 8 Marks L2 CO2 PO1 . space P<sub>2</sub>of polynomials of atmost degree two over R.
  - b) Find the Linear transformation  $T: \mathbb{R}^3 \to \mathbb{R}$  defined by 4 Marks L1 CO2 PO1 T(1,1,1) = 3, T(0,1,-2) = 1, T(0,0,1) = 2.

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

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		APPLIED PHYSICS [Civil Engineering, Mechanical Engineering	זן			
Time: 3 hours		Max. Marks:			60	
	Answer One Question from each Unit All questions carry equal marks					
		UNIT-I				
1.	a)	Explain the terms:	8 Marks	L2	CO1	PO1
		<ul><li>i) Total internal reflection.</li><li>ii) Numerical Aperture.</li><li>iii) V number.</li></ul>				
	b)	An optical fiber with 60 $\mu$ m 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
2	a)	( <b>UK</b> ) Discuss the double crucible technique to fabricate optical fiber	8 Marks	12	CO1	PO1
2.	a) b)	Explain the principle and working of liquid level sensors.	4 Marks	L2 L2	C01	PO1
	,					
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	8 Marks	L1	CO1	PO2
		a hall of volume 1500m <sup>3</sup> and reverberation time of 0.5 s.				
4	a)	( <b>OK</b> ) Explain principle construction and working of magnetostriction	8 Marks	L2	CO1	PO1
т.	u)	method to produce ultrasonic waves.	0 IvidiK5	Ľ	001	101
	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	6 Marks	L1	CO2	PO1
	<b>b</b> )	acceleration-time curve of a body in rectilinear motion.	6 Marks	13	$CO^{2}$	PO2
	0)	of a projectile in inclined projection.	U IVIAIKS	LJ	002	102
		(OR)				
6.	a)	Derive an expression for the rotational moment of a wheel rotating about its own axis with an angular acceleration ' $\alpha$ '	6 Marks	L3	CO2	PO1 PO2
	b)	A flywheel of moment of inertia 5000kg $m^2$ having retardation	6 Marks	L2	CO2	PO2
	,	$0.1 \text{ rad/s}^2$ 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.				
7	- )	UNIT-IV	( Maulaa	т 1	cor	DO 1
1.	a)	coefficient of thermal conductivity and derive an expression for	6 Marks	LI	002	POI
	b)	Summarize the rectilinear flow of heat along a uniform bar.	6 Marks	L2	CO2	PO1
	,	(ÕR)				
8.		Elaborate the heat conduction through compound media in series	12 Marks	L2	CO2	PO2
9	a)	Explain the preparation of metallic glasses by RE sputtering	8 Marks	12	CO3	PO1
).	u)	technique.	0 IvidiK5	L/Z	005	101
	b)	List various applications of metallic glasses.	4 Marks	L1	CO3	PO2
10		(OR)		т 1	001	<b>DO</b> 1
10	a)	what are the shape memory alloys and outline the properties of NiTi alloy?	8 IVIARKS	LI	003	POI
•	b)	List various applications of SMA.	4 Marks	L1	CO3	PO1

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Time: 3 hours

SVEC-19 Roll No.

### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

### **BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**

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

Max. Marks: 60

CO1

**PO2** 

## **Answer One Ouestion from each Unit**

All questions carry equal marks

# UNIT-I

- With neat sketch, explain working principle of single loop 6 Marks 1. a) L2 CO1 **PO2** generator.
  - Derive the average, RMS value, Form Factor, Peak Factor for a 6 Marks L3 CO1 b) PO2 sinusoidal waveform.

### (**OR**)

- 2. a) State and explain KVL and KCL with examples. 6 Marks L1 CO1 PO1 6 Marks L2
  - Find the current in 5 ohm resistor. b)



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	6 Marks	L1	CO2	PO1
		costs of supply and power factor correction equipment but independent of the original power factor". Justify your answer with relative equations.				

### (**OR**)

4.	a)	Sketch the typical layout and explain the operation of Hydro	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- $\phi$ 4-pole induction motor is supplied from 3 $\phi$ 50Hz <b>ac</b> supply. Find :	6 Marks	L1	CO3	PO1
		<ul><li>i) synchronous speed.</li><li>ii) rotor speed when slip is 3%.</li><li>iii) the rotor frequency when runs at 500 r.p.m.</li></ul>				
	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

With neat diagram, explain the working of a transformer. b) 6 Marks Ll

		(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** 

**SVEC-19** 

Ti	ime: 3	hours		Max.	Marks:	60
		Answer One Question from each Unit				
		All questions carry equal marks				
1.	a)	Illustrate the algorithms implementation with necessary examples.	6 Marks	L1	C01	PO1
	b)	How to handle input and output in python? (OR)	6 Marks	L2	C01	PO1
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
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
5	a)	Write a python program to sort a given list	6 Marks	L1	C02	PO2
	u) 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
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. <b>(OR)</b>	6 Marks	L1	C02	PO2
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
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. (OR)	6 Marks	L2	C02	PO1
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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### **SREE VIDYANIKETHAN ENGINEERING COLLEGE**

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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 Explain the geological classification of stones with examples. 4 Marks CO1 PO1 1. a) L4 **PO2** b) List out various tools for blasting and describe them. 4 Marks L2 CO1 PO1 Write about classification of bricks. 4 Marks L2 CO1 PO1 c) (**OR**) 2. a) Discuss manufacturing process of bricks. 6 Marks L4 CO1 PO1 Write various characteristics of a good tile. b) 6 Marks L2 CO1 PO1 UNIT-II 3. Draw the structure of a tree and mention their components. L4 CO1 **PO1** a) 6 Marks b) Explain any four defects in timber. 6 Marks L4 CO1 PO1 **PO2** (**OR**) List out various building materials for low cost housing and CO1 PO1 4. a) 6 Marks L2 explain any two of them with their merits and de-merits. **PO2** b) Describe briefly about paints and varnishes. 6 Marks CO1 PO1 L4 UNIT-III) PO1 5. Explain the manufacturing process of ordinary Portland cement. 6 Marks L4 CO1 a) **PO2** b) Enumerate various cements and discuss any two types of cements 6 Marks L2 CO1 PO1 with their proprieties. (**OR**) 6. a) Explain the classification of aggregates and discuss the properties 6 Marks L4 CO1 PO1 of aggregates. PO<sub>2</sub> What do you mean by bulking of sand and describe how to find b) 6 Marks CO1 PO1 L4 out the bulking of sand. **PO2** PO5 UNIT-IV Define workability and explain how to find out workability of PO1 7. a) 6 Marks L4 CO1 fresh concrete in laboratory. **PO2** Discuss about segregation and bleeding of concrete. PO1 b) 6 Marks L4 CO1 (OR)8. Explain various Non-destructive tests to be conducted on 12 Marks L4 CO1 PO1 hardened concrete with neat sketches. PO<sub>2</sub> UNIT-V 9. Define Shrinkage and explain the various types of shrinkage. 6 Marks L4 CO1 **PO1** a) b) Explain various factors affecting creep of concrete. 6 Marks L4 CO1 PO1 **PO2** (**OR**) CO<sub>2</sub> 10 Describe the procedure for Mix design of concrete as per 12 Marks L4 PO1 IS 10262-2009. **PO2** 

Time: 3 hours



Roll No.

### **SREE VIDYANIKETHAN ENGINEERING COLLEGE**

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

### **ENGINEERING MECHANICS**

[ Civil Engineering ]

Max. Marks: 60

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

# UNIT-I

a) Figure shows the connecting rod BA and crank AO. At the given 6 Marks L3 CO1 PO1 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.



b) Two smooth cylinders with diameters 250mm and 400mm 6 Marks L4 CO1 PO1 respectively are kept in a groove with slanting surfaces making angles 60° and 30° as shown in the figure. Determine the reactions at contact points A, B and C.



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° to the horizontal and BC at 45° 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 6 Marks L4 CO1 PO1 the members BC and CD. PO2



UNIT-II

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



	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	8 Marks	L4	CO1	PO1
	,	150N respectively. Find the smallest value of the horizontal force				PO2
		F to just move the lower block B if				

- i) the block is restrained by a string.
- ii) when the string is removed.



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

6. Find the area moment of inertia about the centroidal axes for a 12 Marks L4 CO1 PO1 given area shown in the figure. PO2

		20 cm				
		5 cm				
		30 cm 5 cm				
		5 cm				
		40 cm				
_				<b>T</b> 4	001	DO1
7.		A mild steel rod of 20mm diameter and 300mm long is enclosed centrally inside a hollow copper tube of external diameter 30mm	12 Marks	L4	COI	PO1 PO2
		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 $40$ kN If E for steel and copper is $200 \text{ GN/m}^2$ and				
		100 $\text{GN/m}^2$ respectively, find the stresses developed in the rod				
		and tube. Also find the extension of the rod.				
8.	a)	The safe stress, for a hollow steel column which carries an axial	6 Marks	L4	CO1	PO1
		load of $2.2 \times 10^3$ kN is $120$ MN/m <sup>2</sup> . If the external diameter of the				PO2
	b)	Find the modulus of elasticity for a rod, which tapers uniformly	6 Marks	L4	CO1	PO1
		from 40mm to 25mm diameter in a length of 400mm. The rod is				PO2
9.		A cylindrical shell 600mm diameter and 3m long, 10mm thick is	12 Marks	L4	CO2	PO1
		subjected to 2.5MPa. $E = 200GPa$ and $\mu = 0.25$ Find:				PO2
		i) Change in length. ii) Change in diameter.				
		iii) Change in volume. iv) Stresses.				
		(OR)				
10	a)	A cylindrical vessel of 3mm thick, length and internal diameter of the vessel are 80cm and 30cm respectively. Determine the	5 Marks	L4	CO2	PO1 PO2
•		longitudinal and circumferential stresses in the cylindrical shell				102
	h)	due to internal pressure of 1.5 N/mm <sup>2</sup> . Take $E = 2 \times 10^5$ N/mm <sup>2</sup> A thick pipe of 280mm external diameter and 200mm internal	7 Morks	T A	$CO^{2}$	
	0)	diameter is subjected to an internal pressure of 12MPa. What	/ 1 <b>VIAIKS</b>	L4	002	PO2
		minimum external pressure can be applied so that the tensile				
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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 6 Marks L3 CO1 PO3 drops across all resistors.



#### (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 6 Marks L3 CO1 PO2 circuit.



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 5 $\Omega$  and a capacitance of 6 Marks L1 CO2 PO1  $8\mu$ F 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.

(OR)

4. a) Find the form factor for the following waveform shown in figure 6 Marks L2 CO2 PO1 below.



b) Elucidate measurement of power and power factor of a balanced 6 Marks L2 CO2 PO1 3 phase load with neat sketch using two watt meter method.

- 5. a) Show that under the condition of maximum power transfer, the 6 Marks L2 CO3 PO1 efficiency of the circuit is 50 %.
  - b) State and explain Millman's theorem with suitable example. 6 Marks L3 CO1 PO1

(OR)

6. a) Verify Superposition theorem for  $4\Omega$  resistor for the following 6 Marks L1 CO3 PO2 circuit.



b) Describe the concept of duality and dual pairs. Also state the 6 Marks L3 CO3 PO3 procedure followed to interchange between dual pairs.
a) Two similar coils connected in series gave a total inductance of 6 Marks L1 CO4 PO2 CO2 multiplication of the solid in series gave a total inductance of 6 Marks L1 CO4 PO2

7.	a)	1 wo 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	LI	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
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
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. $\textcircled{\begin{tabular}{c} \begin{tabular}{c} \begi$	6 Marks	L2	CO4	PO1

SVEC-19

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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

CO1

PO<sub>2</sub>

L3

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

# 

1. a) With reference to the circuit shown in figure below, find : 6 Marks i)  $I_x$  if  $I_1=12mA$ . ii)  $I_1$  if  $I_x=12mA$ .



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



2. a) Determine the value of 'V' such that the current in  $(3+j4\Omega)$  is 6 Marks L4 CO1 PO2 zero.



b) Find the effective resistance between points A and B for the 6 Marks L3 CO1 PO2 given circuit.



#### UNIT-II 3. A two element series circuit is connected across AC source given 6 Marks L3 **CO2 PO2** a) by $V=200\sqrt{2}Sin(314t+20^\circ)$ . The current in the circuit is found to be i= $10\sqrt{2} \cos(314 \text{ t-}25^\circ)$ . Determine the parameters of the circuit. Also determine the power factor, real power and reactive power taken by the circuit. 6 Marks PO<sub>2</sub> b) Explain the sinusoidal response of series RL circuit. L2 CO1 (**OR**) 4. Mention the properties of series resonant circuit. 4 Marks L2 CO1 PO<sub>2</sub> a) A series RLC circuit consists of $50\Omega$ resistance, 0.2 H inductance 8 Marks L3 CO<sub>2</sub> PO<sub>2</sub> b) 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. UNIT-III 5. a) For the network shown below calculate the maximum power 8 Marks L3 CO1 PO<sub>2</sub> delivered to load resistance R<sub>L</sub>. 3Ω 21, 1, 4Ω ≤ 6 Ω R b) State and illustrate Millmann's theorem with an example. 4 Marks L3 CO1 PO<sub>2</sub> (**OR**) Find the current through $2\Omega$ resistor using Thevenin's theorem. 6. L3 CO1 PO<sub>2</sub> a) 6 Marks 20 V 5Ω 2Ω 10 Ω 10 V 40 V b) Find the current through $2\Omega$ resistor using super position L3 CO1 PO<sub>2</sub> 6 Marks theorem. 20 V 5Ω 2Ω $\Lambda\Lambda$



# UNIT-IV

- a) A series RL circuit with initial condition I<sub>0</sub> in the inductor is 6 Marks L3 CO1 PO2 connected to a DC voltage V at t=0, Derive expression for the instantaneous current through the inductor for t >0.
  - b) In the network shown in fig. a steady state is reached with the 6 Marks L3 CO2 PO2 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  $V_b(0^+)$ .



- 8. a) Obtain the DC response for a simple RL circuit with differential 4 Marks L2 CO1 PO2 equations approach.
  - b) In the circuit diagram shown in fig the switch S is closed at t=0 8 Marks with the network previously unenergized. Use laplace transform method and evaluate  $i_1(t)$ .



6 Marks L3 CO1 PO2

L3

CO2

PO6

b) Show that the overall Z-parameters for series connected two-port 6 Marks L2 CO1 PO2 networks is simply the sum of Z matrices of the individual network.

 $v_2$ 

- (OR) 10 a) Determine the Z- parameters of the T-network. 6 Marks L3 CO1 PO2  $1\Omega$   $2\Omega$   $-\sqrt{10}$   $\sqrt{10}$   $-\sqrt{10}$   $\sqrt{10}$   $\sqrt{$ 
  - b) Establish the relationship between Y and Z parameters.. 6 Marks L2 CO1 PO2

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Time: 3 hours

SVEC-19

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

### **BASIC ENGINEERING MECHANICS**

#### [Mechanical Engineering]

Max. Marks: 60

CO1

PO1

**PO2** 

# Answer One Question from each Unit

### All questions carry equal marks

### UNIT-I

1.	a)	Explain Lami's Theo	rem.		4 Marks	L2	CO1	PO1
	b)	Find the resultant of a	a system of concurren	it, coplanar forces as	8 Marks	L2	CO1	PO1
		$F_1 = (500N, 0^0)$	$F_1 = (300N, 45^0)$	$F_1 = (400 \text{N}, 180^{\circ})$				PO2
		$F_1 = (200N, -150^{\circ})$	$F_1 = (100N, -60^{\circ})$ .					
				$(\mathbf{OP})$				

If a rod of length 3R is placed horizontally in a hemispherical 2. 12 Marks bowl of radius R, determine the angle  $\alpha$  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.



3. State and prove Varignon's theorem. a)

A beam hinged at A is supported in a horizontal position by a b) 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.



#### (**OR**)

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



4 Marks	L2	CO1	PO1
8 Marks	L2	CO1	PO1
			PO2

L2

# UNIT-III

The two blocks (A=30 N and B=50 N) are placed on the rough 5. 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.



### (**OR**)

12 Marks 6. Two blocks A and B are resting against a wall and the floor as L2 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.



6 Marks L3 CO<sub>2</sub> PO1

L3

CO<sub>2</sub>

6 Marks

**PO2** 

PO1

7. Find the centroid for the shaded area shown. a)



- b) State and prove Parallel Axis theorem.
- (**OR**)
- 8. Find the moment of inertia of the plane area, about centriodal x 12 Marks L3 CO<sub>2</sub> PO1 PO<sub>2</sub> and y-axis.



- An elevator of mass 2500kg is moving vertically downwards 9. 10 Marks L2 CO3 PO1 a) with a constant acceleration. Starting from rest, it travels a **PO2** 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?
  - Define impulse-momentum principle. b)

PO1 2 Marks L2 CO3

12 Marks L2 CO1 PO1 PO<sub>2</sub>

CO1

PO1

**PO2**
6 Marks L2 CO4 PO1

- Define the following terms:
  - i) Periodic motion.ii) Fundamental mode of vibration.
  - iii) Degree of freedom.
  - iv) Simple harmonic motion.
- b) Calculate equivalent stiffness of the spring for the system shown 6 Marks L2 CO4 PO1 below, which has spring stiffness of 3000 N/m. PO2



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a)

**CODE No.: 19BT20302 SVEC-19** Roll No. SREE VIDYANIKETHAN ENGINEERING COLLEGE (An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu) I B.Tech II Semester (SVEC-19) Supplementary Examinations August – 2021 MATERIAL SCIENCE AND ENGINEERING [Mechanical Engineering] Time: 3 hours Max. Marks: 60 **Answer One Ouestion from each Unit** All questions carry equal marks UNIT-I 1. What is a crystal defect? Discuss various types of crystal defects. 12 Marks CO1 **PO1** L1 (**OR**) Define Space lattice. Differentiate between BCC and FCC crystal 2. 6 Marks L2 CO1 **PO2** a) structures. b) What is critically resolved shear stress? Explain its significance. 6 Marks L3 CO1 **PO2** UNIT-II ) 3. Distinguish between annealing and normalizing. 6 Marks L3 CO1 **PO1** a) b) Write a short note on continuous cooling transformation 6 Marks CO1 **PO2** L1 diagrams. (**OR**) What is case hardening? Discuss various methods of case 12 Marks L1 CO1 **PO2** 4. hardening. UNIT-III Discuss how steels are specified by BIS standards with suitable 6 Marks L1 CO2 PO7 5. a) examples. b) Write short notes on structure properties and applications of tool 6 Marks L1 CO<sub>2</sub> PO<sub>3</sub> steels. (**OR**) What are the various properties and applications of : 6. a) 6 Marks L1 CO<sub>2</sub> PO<sub>3</sub> i) Low carbon steels. ii) Hadfield manganese steels. Write short notes on: 6 Marks L1 CO2 PO1 b) i) Nodular cast iron. ii) Chilled cast iron. UNIT-IV List the properties and applications of Beryllium and its alloys. 7. a) 6 Marks L2 CO<sub>2</sub> PO3 List the properties and applications of Titanium and its alloys. 6 Marks L2 b) CO2 PO<sub>3</sub> (**OR**) Discuss the structure, properties and applications of Aluminum 8. 12 Marks L1 CO2 PO<sub>3</sub> and its alloys. UNIT-V Discuss various types of fiber reinforced composites and their 9. 12 Marks L2 CO<sub>2</sub> PO3 applications. PO7 (**OR**) What is a polymerization reaction? What are the various ways of 10 6 Marks L1 CO<sub>2</sub> **PO2** a) classifying polymers? b) Discuss the various properties and application of ceramics. 6 Marks L1 CO2 PO<sub>3</sub> ද්මු ද්මු କ୍ର

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|    |          | I B.Tech II Semester (SVEC-19) Supplementary Exam                 | inati  | ons Augu   | st – 20   | 021      |              |
|    |          | DIGITAL LOGIC DESIGN                                              |        |            |           |          |              |
|    |          | [Computer Science and Engineering, Information                    | n Tec  | hnology,   |           |          |              |
|    |          | <b>Computer Science and Systems Enginee</b>                       | ring]  |            |           |          |              |
| Ti | me: 3    | hours                                                             |        |            | Max       | . Marks: | 60           |
|    |          | Answer One Question from each Un                                  | it     |            |           |          |              |
|    |          | All questions carry equal marks                                   |        |            |           |          |              |
|    |          | UNIT-I                                                            |        |            |           |          |              |
| 1. | a)       | Each of the following arithmetic operations is correct in at lea  | ast    | 6 Marks    | L2        | CO1      | PO1          |
|    |          | one number system. Determine the possible bases of the number     | ers    |            |           |          |              |
|    |          | in each operation.                                                |        |            |           |          |              |
|    | • `      | i) $1234 + 5432 = 6666$ . ii) $41/3 = 13$ .                       |        |            |           | 004      | <b>D</b> O 4 |
|    | b)       | Represent the following decimal numbers in Excess-3 code.         |        | 6 Marks    | L2        | COI      | POI          |
|    |          | 1) 286 	11) 807 	111) 429.5 	(OP)                                 |        |            |           |          |              |
| 2  | a)       | Express the following functions in a sum of minterms              |        | 6 Marks    | L2        | CO1      | PO1          |
|    | u)       | i) $F = D(A' + B) + B'D$ ii) $F = xy + x'y' + y'z$                |        | 0 10100110 |           | 001      | 101          |
|    | b)       | Convert the following Gray codes to binary number.                |        | 6 Marks    | L2        | CO1      | PO1          |
|    |          | i) 10011. ii) 101110. iii) 100010110.                             |        |            |           |          |              |
|    |          | (UNIT-II)                                                         |        |            |           |          |              |
| 3. | a)       | Reduce the following expression using K-map and implement         | ent    | 6 Marks    | L3        | CO1      | PO2          |
|    |          | using NAND gates:                                                 |        |            |           |          |              |
|    |          | $F = \sum m (9,10,12) + d (3,5,6,7,11,13,14,15)$                  |        |            |           |          |              |
|    | b)       | Implement EX-NOR and NOR gates with minimum number                | of     | 6 Marks    | L2        | CO1      | PO1          |
|    |          | NAND gates only.                                                  |        |            |           |          |              |
| 1  | a)       | (OR)                                                              |        | 6 Morka    | τ2        | CO1      | DOJ          |
| 4. | a)       | $E = \prod_{n=1}^{\infty} M(0, 1, 2, 4, 5, 6, 0, 11, 12, 14, 15)$ |        | 0 WIAIKS   | LS        | COI      | r02          |
|    | 1 \      | $F = \prod M(0,1,2,4,5,0,9,11,12,14,15)$                          | `      |            | т о       | 001      | DOA          |
|    | b)       | Obtain the reduced expression $F = \sum m(2,4, 6,8,10,12,12)$     | 5)     | 6 Marks    | L3        | COI      | PO2          |
|    |          | using K-map and realize with NOR gates.                           |        |            |           |          |              |
|    |          | (UNIT-III)                                                        |        |            |           |          |              |
| 5. | a)       | Design a combinational circuit with four inputs and four output   | ts.    | 6 Marks    | L4        | CO2      | PO4          |
|    |          | The output generates the 2's complement of the input bina         | ry     |            |           |          |              |
|    | h)       | number.                                                           |        | 6 Morka    | τ 4       | $CO^{2}$ | DOJ          |
|    | 0)       | (OR)                                                              |        | o marks    | L4        | 002      | PO2          |
| 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 an           | nd     | 6 Marks    | L4        | CO2      | PO4          |
|    |          | explain its operation.                                            |        |            |           |          |              |
|    |          | UNIT-IV                                                           |        |            |           |          |              |
| 7. | a)       | Illustrate the function of JK flip-flop using NAND gates in deta  | il.    | 6 Marks    | L4        | CO2      | PO1          |
|    | b)       | Draw the logic diagram of mod 6 ripple counter usin               | ng     | 6 Marks    | L4        | CO2      | PO2          |
|    |          | T flip-flops and explain its operation.                           |        |            |           |          |              |
| 8  | a)       | (OR)<br>Design a MOD 8 parallel counter using T fin flong         |        | 6 Mortes   | Т Л       | $CO^{1}$ |              |
| 0. | a)<br>h) | Describe the operation of SR flin-flop in detail                  |        | 6 Marks    | L4<br>I 4 | $CO_2$   | PO4          |
|    | 0)       | Deserve the operation of ore mp nop in detail.                    |        | J MILLING  | LT        | 002      | 102          |

## UNIT-V

9. a) Give the logic implementation of a 32 x 4 bit ROM using a 6 Marks L4 CO2 PO2 decoder of a suitable size.
b) Show how the PLA circuit would be programmed to implement 6 Marks L4 CO2 PO1 the 3 bit binary to gray conversion.

(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 6 Marks L4 CO2 PO1 conversion using a PLA.

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### 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**]

| Ti | me: 3 | hours                                                                                                                 |         | Max | . Marks: | 60   |
|----|-------|-----------------------------------------------------------------------------------------------------------------------|---------|-----|----------|------|
|    |       | Answer One Question from each Unit<br>All questions carry equal marks                                                 |         |     |          |      |
|    |       |                                                                                                                       |         |     |          |      |
| 1. | a)    | Explain the following object oriented concepts.                                                                       | 6 Marks | L1  | CO1      | PO1  |
|    | b)    | Explain the use of "this" keyword with an example.                                                                    | 6 Marks | L2  | CO1      | PO1  |
| 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  |
| 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.<br>(OR)                                                    | 6 Marks | L1  | CO2      | PO2  |
| 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  |
| 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  |
| 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 |
| 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.<br>(OR)                                                   | 6 Marks | L3  | CO3      | PO11 |
| 10 | a)    | Discuss about card and border layouts with suitable example.                                                          | 6 Marks | L2  | CO3      | PO1  |
|    | b)    | Write a Java program using the following:<br>i) JTable ii) JTabbedPane.                                               | 6 Marks | L2  | CO3      | PO1  |
|    |       | \$\$ \$\$ \$                                                                                                          |         |     |          |      |

CODE No.: 19BT1BS02

### 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]

| Ti | me: 3      | hours                                                                     |            | Max | . Marks: | 60           |
|----|------------|---------------------------------------------------------------------------|------------|-----|----------|--------------|
|    |            | Answer One Question from each Unit<br>All questions carry equal marks     |            |     |          |              |
|    |            |                                                                           |            |     |          |              |
| 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  | COI      | POI          |
|    |            | (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  | COI      | POI          |
| 4  | a)         | Explain the importance of various biomolecules in the formation           | 7 Marks    | L2  | CO1      | PO1          |
|    | )          | of living organisms.                                                      | ,          |     | 001      | 101          |
|    | 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                | 6 Marks    | L2  | CO2      | PO1          |
|    |            | physics? Explain.                                                         |            |     |          |              |
|    | b)         | What is the process by which information is transferred from DNA to mRNA? | 6 Marks    | L1  | CO2      | PO1          |
| 6  |            | (OR)                                                                      | 12 Mortes  | 1.2 | $CO_{2}$ |              |
| 0. |            | Explain about translation and single gene disorders.                      | 12 Marks   | LZ  | 002      | PUI          |
| _  |            | (UNIT-IV)                                                                 |            |     | ~ ~ •    |              |
| 7. | a)         | Distinguish between Transgenic animals and cloned animals with            | 6 Marks    | L4  | CO3      | PO1          |
|    | h)         | How Biosensors and biochips are prepared? List their                      | 6 Marks    | 14  | CO3      | PO6          |
|    | 0)         | applications.                                                             | 0 IVIUIK5  | 21  | 005      | 100          |
|    |            | (OR)                                                                      |            |     |          |              |
| 8. | a)         | Explain major steps in the recombinant DNA technology and add             | 8 Marks    | L2  | CO3      | PO6          |
|    | <b>b</b> ) | a note on recombinant microbes.                                           | 1 Mortes   | 12  | $CO^{2}$ |              |
|    | 0)         |                                                                           | 4 IVIAIKS  | LJ  | COS      | FUI          |
| 0  |            | UNIT-V                                                                    |            |     | 001      | <b>D</b> O 1 |
| 9. | a)         | What is neuron and synapse? Explain the process of                        | 6 Marks    | L2  | COI      | POI          |
|    | b)         | Summarize the applications of DNA finger printing                         | 6 Marks    | L2  | CO3      | PO6          |
|    |            | (OR)                                                                      | 0 10141110 |     | 200      | 100          |
| 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          |

SVEC-19

Time: 3 hours

### 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**]

Max. Marks: 60

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

|   | LINITE T |   |
|---|----------|---|
| ( |          | ) |

| 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        |
| 2   | a) | ( <b>UK</b> )<br>Summarize the theory of Quarter wave plate and Half wave plate                                                  | 4 Marks   | L2       | CO1      | PO1        |
| 2.  | b) | Describe the construction and working of a Nicol's Prism.                                                                        | 8 Marks   | L2<br>L2 | CO1      | PO1        |
|     | -) | UNIT-II)                                                                                                                         |           |          |          | -          |
| 3.  | a) | Explain the physical significance of gradient, divergence and                                                                    | 4 Marks   | L2       | CO2      | PO1        |
|     | b) | curl.<br>Identify the four Maxwell's field equations and explain their                                                           | 8 Marks   | L3       | CO2      | PO1        |
|     | ,  | physical significance.                                                                                                           |           |          |          |            |
|     |    | (OR)                                                                                                                             |           |          |          |            |
| 4.  | a) | Recall the principle behind the functioning of optical fiber.<br>Explain the differences between the step index fiber and graded | 9 Marks   | L2       | CO2      | PO1        |
|     | b) | Index liber.                                                                                                                     | 3 Marks   | 13       | $CO^{2}$ | PO2        |
|     | 0) | ontical fiber with core and cladding refractive indices being 1.48                                                               | JIVIAIKS  | LJ       | 002      | 102        |
|     |    | and 1.45 respectively.                                                                                                           |           |          |          |            |
|     |    | (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                                                                         | 7 Marks   | L2       | CO3      | PO1        |
|     |    | insulators based on the formation of energy bands.                                                                               |           |          |          |            |
| C   | `` | (OR)                                                                                                                             | 10 1 1    | тр       | 001      | DOO        |
| 6.  | a) | State Hall effect. Derive an expression for Hall coefficient.<br>Mention its applications.                                       | 10 Marks  | L3       | 003      | PO2        |
|     | b) | The $R_H$ of a specimen is 3.66 x 10 <sup>-4</sup> m <sup>3</sup> c <sup>-1</sup> . Its resistivity is                           | 2 Marks   | L1       | CO3      | PO2        |
|     |    | 8.93 x 10 <sup>-3</sup> Ωm. Find $\mu$ and n.                                                                                    |           |          |          |            |
|     |    | 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<br>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      | POI        |
|     | D) | superconductivity                                                                                                                | ð iviarks | LI       | COS      | PUI        |
|     |    | (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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## 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  |
|----|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----|-----|------|
| 2. | a) | Describe the structure of H <sub>2</sub> O and NH <sub>3</sub> molecule in terms of                                                                                                                                                                                                                                                                            | 5 Marks  | L2 | CO1 | PO1  |
|    | ,  | VSEPR theory.                                                                                                                                                                                                                                                                                                                                                  |          |    |     |      |
|    | b) | Predict the magnetic property and bond order of carbon monoxide molecule based on its energy level diagram.                                                                                                                                                                                                                                                    | 7 Marks  | L3 | CO1 | PO2  |
|    |    |                                                                                                                                                                                                                                                                                                                                                                |          |    |     |      |
| 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 <sub>3</sub> 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  |
|    |    |                                                                                                                                                                                                                                                                                                                                                                |          |    |     |      |
| 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  |

SVEC-19

# 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             | 7 Marks  | L2 | CO5 | PO1 |
|    |    | catalytic cracking process with a neat diagram.                            |          |    |     |     |
|    | b) | Calculate the HCV and LCV of coal having the following                     | 5 Marks  | L3 | CO5 | PO2 |
|    |    | compositions;                                                              |          |    |     |     |
|    |    | carbon = $80\%$ , hydrogen = $10\%$ , nitrogen = $4\%$ , sulphur = $2\%$ , |          |    |     |     |

ash = 4%, latent heat of steam = 587 kcal/kg.

\$} \$} \$}

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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
- 2. (OR) Show that  $x = 1 - \frac{8}{\pi^2} \left[ \frac{1}{1^2} \cos \frac{\pi x}{2} + \frac{1}{3^2} \cos \frac{3\pi x}{2} + \frac{1}{5^2} \cos \frac{5\pi x}{2} + \dots \right]$  12 Marks L2 CO1 PO2 in the interval (0, 2).

3. a) Determine 
$$L\{f(t)\}$$
 where  $f(t) = t^2 e^{-3t} \sin 2t$ .  
 $\int_{t}^{t} e^{t} \sin t$  6 Marks L3 C01 P01  
6 Marks L1 C01 P01

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b) Find the Laplace transform of 
$$\int_{0}^{t} \frac{e^{-\sin t}}{t} dt$$
.

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  $L\left\{t^2 \ e^{-3t} \sin 2t\right\}$ . 6 Marks L5 CO1 PO1

5. a) Find the inverse Laplace transform of 
$$\log\left(\frac{s+a}{s+b}\right)$$
.  
6 Marks L1 CO1 PO1  
6 Marks L3 CO1 PO2

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

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.

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 6 Marks 7. L1 CO2 PO1 a)

echelon form.

- CO2 b) Determine the Eigen values and Eigen vectors of 6 Marks L3 PO<sub>2</sub>  $B = 2A^2 - \frac{1}{2}A + 3I$ , where  $A = \begin{bmatrix} 8 & -4 \\ 2 & 2 \end{bmatrix}$ . (**OR**)
- Find the orthogonal transformation which transforms the **PO2** 8. 12 Marks L1 CO<sub>2</sub> quadratic form  $3x^2 + 3y^2 + 3z^2 + 2xy + 2xz - 2yz$  to canonical form and write the corresponding canonical form.

UNIT-V

 $\begin{bmatrix} 1 \\ -1 \\ 0 \end{bmatrix}, \begin{bmatrix} 0 \\ 1 \\ -1 \end{bmatrix} and \begin{bmatrix} -1 \\ 0 \\ 1 \end{bmatrix} is 6 Marks L2 CO2$ PO1 9. a) Check whether the set of vectors

linearly independent or not.

Show that the transformation  $T: \mathbb{R}^2 \to \mathbb{R}^3$  defined by 6 Marks L2 CO<sub>2</sub> PO1 b)  $\begin{bmatrix} -1 \\ -1 \end{bmatrix}$ 

$$T\begin{bmatrix} x\\ y\end{bmatrix} = \begin{bmatrix} -y\\ x+2y\\ 3x-4y\end{bmatrix}$$
 is linear.

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 6 Marks 10 a)

(**OR**)

L2

CO<sub>2</sub>

PO1

 $R^{3}(R)$ .

Show that the linear transformation  $T: \mathbb{R}^2 \to \mathbb{P}_1$  defined by 6 Marks L2 CO<sub>2</sub> **PO2** b)  $T \begin{vmatrix} a \\ b \end{vmatrix} = a + (a + b)x$  is one-to-one and onto, where P<sub>1</sub> is a vector

space of all linear polynomial over real field.

<del>(</del>} <del>(</del> \_

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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. Mar                                                |    |                                                                                                                                                                      |          |     |          | 60         |
|-----------------------------------------------------------------------|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----|----------|------------|
| Answer One Question from each Unit<br>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<br>numerical aperture of a given optical fiber whose refractive<br>indices are 1.49 and 1.45 respectively. | 3 Marks  | L3  | CO1      | PO2        |
| 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        |
| 4                                                                     | a) | (OR)<br>Define ultragenies Describe the Magnetostriction method for                                                                                                  | 9 Martra | 1.2 | COL      |            |
| 4.                                                                    | a) | their production.                                                                                                                                                    |          | LZ  | C01      | POI        |
|                                                                       | b) | write the industrial application of ultrasonics.                                                                                                                     | 4 Marks  | LI  | COI      | POI        |
| 5                                                                     | a) | Deduce expressions for time of flight and herizontal range of a                                                                                                      | 7 Marka  | 12  | $CO^{2}$ | DOJ        |
| Э.                                                                    | a) | projectile in inclined projection.                                                                                                                                   |          | L2  | 002      | PO2        |
|                                                                       | 6) | Show that the path of a projectile is a parabola in an inclined projection on ground level.                                                                          | 5 Marks  | LI  | 002      | PO2        |
| C                                                                     | `  |                                                                                                                                                                      | OM 1     | т о | 002      | <b>DO2</b> |
| 6.                                                                    | a) | Derive an expression for work energy equation for a body of<br>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                                         | 4 Marks  | L1  | CO2      | PO2        |
|                                                                       |    | 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?                                                                                                                   |          |     |          |            |
| 7.                                                                    |    | Explain rectilinear flow of heat conduction along a uniform bar.<br>(OR)                                                                                             | 12 Marks | L2  | CO2      | PO1        |
| 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        |
| 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

Answer One Question from each Unit All questions carry equal marks

## UNIT-I

- 1. a) With neat sketch, explain working principle of single loop 8 Marks L2 CO1 PO1 generator.
  - b) Find the current in each branch of the circuit shown in figure 4 Marks L3 CO1 PO2 using current division method.



(**OR**)

2. a) Find the total power dissipated in the circuit shown in the figure 6 Marks L3 CO1 PO2 (All resistances are in ohms).



b) A series combination of R=10 $\Omega$  and L=20mH has a current 6 Marks L3 CO1 PO2 i(t) = 5 cos(500t+100)A. Obtain the voltages v(t) and V, the phasor current I and sketch the phasor diagram.

## UNIT-II

- Sketch the typical layout and explain the operation of Thermal 3. 8 Marks L2 CO<sub>2</sub> PO1 a) power plant. With neat sketch, explain the working of various types of UPS. b) 4 Marks L2 CO<sub>2</sub> PO7 (**OR**) Derive the expression for most economical power factor. 4. 6 Marks L3 CO<sub>2</sub> **PO2** a) Explain the process of plate earthing with neat sketch. 6 Marks b) L2 CO<sub>2</sub> PO1 (UNIT-III) Explain the constructional details of 3-phase induction motor and 6 Marks 5. a) L2 CO3 PO5 mention it's applications. Suggest the suitable device which transforms the voltage with 6 Marks L2 CO3 PO1 b) constant frequency and power. Derive the EMF equation of that
  - device.

(OR)

Max. Marks: 60

| 6. | a) | List the starting methods of single phase induction motors.<br>Explain the characteristics and principle of operation of capacitor<br>start capacitor run induction motor      | 6 Marks  | L2 | CO3 | PO1 |
|----|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----|-----|-----|
|    | b) | Select a suitable machine which uses steam turbine as the prime<br>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.<br>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<br>op-amp in closed loop configuration. Derive the expressions for<br>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 |          |                                                                                                                                                                                                                                                                                                  | 0,                 | Max. Mark |            | ks: 60     |  |
|---------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------|------------|------------|--|
|               |          | Answer One Question from each Unit<br>All questions carry equal marks                                                                                                                                                                                                                            |                    |           |            |            |  |
|               |          |                                                                                                                                                                                                                                                                                                  |                    |           |            |            |  |
| •             | a)<br>b) | Define algorithm, explain properties of an algorithm.<br>Evaluate the following expression according to operator precedence $4+int(3.78)+6*2/5+3**3**4//2$ .                                                                                                                                     | 6 Marks<br>6 Marks | L1<br>L2  | CO1<br>CO1 | PO1<br>PO1 |  |
|               |          | (OR)                                                                                                                                                                                                                                                                                             |                    |           |            |            |  |
| •             | a)<br>b) | Draw a flow chart to reverse a given number.<br>Explain about sep, end options used in print() with example.                                                                                                                                                                                     | 6 Marks<br>6 Marks | L3<br>L2  | CO1<br>CO1 | PO2<br>PO1 |  |
|               |          | UNIT-II                                                                                                                                                                                                                                                                                          |                    |           |            |            |  |
| •             | a)<br>b) | Define suite and explain about the else suite with for statement.<br>Display the following pattern using python script.                                                                                                                                                                          | 6 Marks<br>6 Marks | L2<br>L3  | CO1<br>CO1 | PO1<br>PO2 |  |
|               |          | 12<br>123<br>1234<br>12345                                                                                                                                                                                                                                                                       |                    |           |            |            |  |
|               |          | (OR)                                                                                                                                                                                                                                                                                             |                    |           |            |            |  |
| -             | a)       | Write a python script to find the largest number among three<br>numbers and display them in ascending order using if-else<br>construct                                                                                                                                                           | 6 Marks            | L3        | CO1        | PO2        |  |
|               | b)       | Develop a python script to print factors for a given integer<br>number.                                                                                                                                                                                                                          | 6 Marks            | L3        | CO1        | PO2        |  |
|               |          | (UNIT-III)                                                                                                                                                                                                                                                                                       |                    |           |            |            |  |
| •             | 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)                                                                                                                                                                                                                                                                                             |                    |           |            |            |  |
| •             | a)       | Define stack. Write a python script to implement stack operations.                                                                                                                                                                                                                               | 6 Marks            | L3        | CO1        | PO3        |  |
|               | b)       | Specify the functionalities of the following functions.<br>i) keys(). ii) values().<br>iii) items(). iv) update().<br>UNIT-IV                                                                                                                                                                    | 6 Marks            | L2        | CO1        | PO1        |  |
|               | 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<br>character from a text file, copy the resultant text into another text<br>file. Find the total occurrences of the eliminated characters and<br>display the count along with the contents of the text file on to the<br>console. | 6 Marks            | L3        | CO2        | PO3        |  |

```
(OR)
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| 8. | a) | Write a python script that reads a line of integers, and then                      | 6 Marks | L3 | CO2 | PO3 |
|----|----|------------------------------------------------------------------------------------|---------|----|-----|-----|
|    |    | displays each integer and the sum of all the integers.                             |         |    |     |     |
|    | b) | Explain functionality of the following functions.                                  | 6 Marks | L1 | CO2 | PO1 |
|    |    | i) ones(). ii) arrange().                                                          |         |    |     |     |
|    |    | iii) logspace(). iv) zeros().                                                      |         |    |     |     |
|    |    | 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 |

\$\$ \$\$ \$\$

Time: 3 hours

### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

### **CIVIL ENGINEERING MATERIALS AND CONCRETE TECHNOLOGY** [Civil Engineering]

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<br>PO2        |
|    | b) | What is quarrying of stone? Explain methods of quarrying. <b>(OR)</b>                               | 6 Marks | L3  | CO1 | PO1               |
| 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<br>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<br>PO2<br>PO7 |
|    |    | (OR)                                                                                                |         |     |     | 101               |
| 6. | a) | Bring out the detailed classification of aggregates and physical properties of aggregates.          | 6 Marks | L1  | CO1 | PO1<br>PO2        |
|    | b) | Mention the different tests to be conducted on fine aggregate and                                   | 6 Marks | L3  | CO1 | PO1               |
|    |    | explain about bulking of sand.                                                                      |         |     |     | 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  | COI | POI               |
|    |    | (OR)                                                                                                |         |     |     | r02               |
| 8. | a) | Calculate the Gel/space ratio and the theoretical strength of a                                     | 6 Marks | L6  | CO1 | PO1               |
|    |    | sample of concrete made with 500gm of cement and 0.5W/c ratio,                                      |         |     |     | PO2               |
|    | b) | Explain how you estimate the quality of concrete by using                                           | 6 Marks | I 4 | CO1 |                   |
|    | 0) | ultrasonic pulse velocity test.                                                                     |         | 1.4 | 001 | PO2               |

SVEC-19

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| 9. | a) | Distinguish between modulus of elasticity and dynamic modulus of elasticity of concrete.                                                                                                                                                                                                                                                                                                                                                                                                                | 6 Marks  | L4 | CO1 | PO1<br>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 <sup>3</sup> 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<br>PO2<br>PO3<br>PO8 |

\$} } } **Time: 3 hours** 

### SREE VIDYANIKETHAN ENGINEERING COLLEGE

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

### **ENGINEERING MECHANICS**

#### [ Civil Engineering ]

Max. Marks: 60

Answer One Question from each Unit

### All questions carry equal marks

### UNIT-I

- Define the following with examples: 6 Marks CO1 PO1 1. a) L4 Coplanar and Non-coplanar forces. **PO2** Collinear and Non-collinear forces. The resultant of three forces is 60N as shown in Fig.1. Two of b) 6 Marks CO1 PO1 L4
  - the three forces are also shown as 20N and 40N. Determine the PO2 third force.



2. Two cylindrical identical rollers A and B, each of weight 12 Marks L4 CO1 PO1 W = 500N are supported by an inclined plane and vertical wall and makes an angle of 30<sup>o</sup> with the horizontal as shown in Fig.2. Assuming all surfaces to be smooth, determine the reactions at A, B and C.



- A ladder 5m long and of 250N weight is placed against a vertical 3. a) 6 Marks L4 CO1 PO1 wall in a position where its inclination to the vertical is 300. A PO<sub>2</sub> 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. A block weighing 100N is resting on a rough plane inclined 20<sup>o</sup> 6 Marks CO1 PO1 b) L4 to the horizontal. It is acted upon by a force of 50N directed **PO2** 
  - 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.

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Determine centroid of shaded area as shown in given Fig.5. b)





L4

L4

CO1

CO1

PO1

**PO2** 

PO1 PO2

6 Marks

6 Marks

- 5. a) Discuss the following terms with suitable examples: 6 Marks L4 CO1 i) Centroid ii) Centre of mass iii) Centre of gravity iv) Radius of gyration b) Determine the centre of gravity of the plane uniform lamina 6 Marks L4 CO1
- 4 m Fig.3 UNIT-III PO1 **PO2** PO1 shown in Fig.4. PO<sub>2</sub> 2.5cm С 5cm 5cm 5ċm A 10cm в

D -12.5cm Fig.4

(**OR**) 6.



the reactions at A and B. 90 kg (882 N) в Зm C Зm

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

4.

12 Marks CO1 **PO1** L4

|    |    | (UNIT-IV)                                                                                                                                                                                                                                                                                                                                                    |          |    |     |                   |
|----|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----|-----|-------------------|
| 7. | a) | Describe the stress strain relationship for mild steel bar.                                                                                                                                                                                                                                                                                                  | 6 Marks  | L4 | CO1 | PO1<br>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 $E=2 \times 10^5 \text{ N/mm}^2$ . | 6 Marks  | L4 | CO1 | PO1<br>PO2        |
|    |    | (OR)                                                                                                                                                                                                                                                                                                                                                         |          |    |     |                   |
| 8. |    | Derive the relationship between Modulus of Elasticity, Modulus of rigidity and Bulk Modulus.                                                                                                                                                                                                                                                                 | 12 Marks | L4 | CO1 | PO1<br>PO2        |
|    |    | UNIT-V                                                                                                                                                                                                                                                                                                                                                       |          |    |     |                   |
| 9. |    | Derive the change in dimension of thin cylindrical shell due to an internal pressure.                                                                                                                                                                                                                                                                        | 12 Marks | L4 | CO1 | PO1<br>PO2        |
|    |    | (OR)                                                                                                                                                                                                                                                                                                                                                         |          |    |     |                   |
| 10 | a) | A pipe of 200mm internal diameter and 50mm thickness carries a fluid at a pressure of 10MN/m <sup>2</sup> . Calculate the maximum and minimum intensities of circumferential stress across the section.                                                                                                                                                      | 6 Marks  | L4 | CO1 | PO1<br>PO2        |
|    | b) | Calculate the thickness of metal necessary for a cylindrical shell of internal diameter 160mm to withstand an internal pressure of $25$ MN/m <sup>2</sup> , if maximum permissible tensile stress is $125$ MN/m <sup>2</sup> .                                                                                                                               | 6 Marks  | L6 | CO2 | PO1<br>PO2<br>PO3 |

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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 6 Marks L3 CO1 PO2 current through the circuit as shown in figure.



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



2. a) Using mesh analysis, find I<sub>0</sub> in the circuit shown in figure. 6 Marks L4 CO1 PO2



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b) Find R<sub>ab</sub> of the network shown in figure, Assume each element is 6 Marks L3 CO1 PO2  $1\Omega$ .



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



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



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

4.



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

- UNIT-III
- 5. Determine the maximum power delivered to the load in the 6 Marks L3 CO1 PO5 a) circuit shown in figure, using maximum power transfer theorem.



Consider the circuit in figure, an ammeter with internal resistance 6 Marks b) L4 CO1 PO5  $R_1$  is inserted between **a** and **b** to measure  $I_0$ . Determine the reading of the ammeter if:  $R_I=500\Omega$ ,  $0\Omega$  using Thevenin's theorem.



(**OR**)

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



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



- Derive the expressions for equivalent inductance of two coils in 7. a) 6 Marks L2 CO1 PO1 parallel with i)parallel aiding and ii) parallel opposition 6 Marks L4 CO1 PO<sub>2</sub>
  - Calculate the mesh currents shown in figure. b)



8. a) For the coupled circuit shown in figure find the input impedance 6 Marks L4 CO1 PO2 at the terminals a-b



- b) Determine the voltage  $V_0$  in the circuit of figure.  $4\Omega$   $4\Omega$   $100/45^{\circ} V$   $100/45^{\circ} V$ 100/45
- UNIT-V 9. Enumerate the various characteristics that a filter should posses 6 Marks L2 CO1 PO1 a) for implementation in signal processing circuits. b) Design a  $\pi$ -section band pass filter having cut-off frequencies of 6 Marks L4 CO<sub>2</sub> PO3 12 kHz and 16 kHz for a load having an impedance of 600  $\Omega$ . (**OR**) 10 a) Define characteristic impedance and derive the characteristic 6 Marks L3 CO1 PO<sub>2</sub> impedance for a T and  $\pi$  networks. Also explain the nature of characteristic impedance in pass band and stop bands. Design m-derived high pass filter having a design impedance of 6 Marks b) L4 CO<sub>2</sub> PO3  $R_0=500\Omega$  and cut-off frequency of 5 kHz and m = 0.32. Also determine the frequency of infinite attenuation.

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

#### NETWORK ANALYSIS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

#### Time: 3 hours

2.

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 12 Marks L4 CO1 PO2 nodes A, B, and C with node D as the reference and find the node voltages.



(**OR**)

Use nodal voltage method to find the voltages of nodes 'm' and 12 Marks L4 CO1 PO2 'n' and currents through  $j2\Omega$  and  $-j2\Omega$  reactance in the network shown below.



- 3. a) Draw the current, impedance and admittance loci for an RC 6 Marks L2 CO1 PO1 Series circuit having constant reactance but variable resistance.
  b) A TV tuner consists of a series RLC circuit consists of resistance 6 Marks L4 CO2 PO6
  - b) A TV tuner consists of a series RLC circuit consists of resistance R = 20, inductance, L = 0.01H and capacitance,  $C = 0.04 \mu F$ . 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.

#### (**OR**)

Draw the phasor representation of voltage and current for 6 Marks CO1 PO1 4. a) L2 Resistor, inductor and capacitor with sinusoidal excitation. A supply of 400V, 50Hz is applied to a series RC circuit. Find b) 6 Marks L4 CO1 PO<sub>2</sub> the value of C if the power absorbed by the resistor to be 500W at 150V. What is the energy stored in a capacitor?

SVEC-19

5. State Superposition theorem and find the current in the  $6\Omega$  12 Marks L3 CO1 PO5 resistor using Superposition theorem for the circuit shown below.



(OR)

6. For the network shown in figure, determine the current through 12 Marks L3 CO1 PO2  $R=10\Omega$  resistor using Thevenin's theorem and verify the result using Norton's theorem.



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 8 Marks L4 CO1 PO2 long time. The switch opens at t = 0. Compute v(t),  $i_1(t)$  and  $i_2(t)$ .



- 8. a) Derive the transient response of series R-L-C circuit, with DC 4 Marks L2 CO1 PO5 excitation using Laplace transform obtain the response for a critically damped case.
  - b) The switch in the circuit in figure has been closed for a long 8 Marks L4 CO2 PO5 time. At t = 0, the switch is opened find  $v_0(t)$  and  $i_0(t)$  for t > 0 using Laplace transformation method.



## UNIT-V

- 9. a) Define reciprocity and symmetry for a generalized two port 6 Marks L1 CO1 PO1 network and derive the conditions for reciprocity and symmetry in terms of Y parameters.
  - b) Find the y parameters for the two-port network shown in figure. 6 Marks L4 CO1 PO4 Invistigate whether the netwok is symmetrical and reciprocal.



(**OR**)

- 10 a) The Z parameters of a two port network are  $Z_{11}=6\Omega$ ,  $Z_{22}=4\Omega$ ,  $Z_{12}=6$  Marks L4 CO1 PO2  $Z_{21}=3\Omega$ . Compute ABCD Parameters and write the describing equations.
  - b) Determine the impedance (Z) parameter of the given two port 6 Marks L4 CO1 PO4 network shown in fig



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

### **BASIC ENGINEERING MECHANICS**

#### [ Mechanical Engineering ]

Time: 3 hours

4.

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 12 Marks L2 CO1 PO1 the three forces are also shown as 20N and 40 N. Determine the third force.



2. The forces on the gusset plate of a joint in a bridge truss act as 12 Marks L2 CO1 PO1 shown in figure. Determine the magnitudes of the two forces P PO2 and F to maintain equilibrium of the joint.



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



(**OR**)

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



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?



6. Determine the force P required to start the wedge shown in 12 Marks L2 CO1 PO1 figure. The angle of friction for all surfaces in contact is 15°. PO2

UNIT-III

12 Marks

L2

CO1

PO1

PO<sub>2</sub>



7. A semicircular area is removed from a trapezium as shown in 12 Marks L3 CO2 PO1 figure (dimensions in mm). Determine the centroid of the PO2 remaining area.



8. a) Define Centre of Gravity and Centre of mass.
b) Determine centroid of shaded area as shown in given figure.
6 Marks
6 Marks



| 6 Marks | L3 | CO2 | PO1 |
|---------|----|-----|-----|
| 6 Marks | L3 | CO2 | PO1 |
|         |    |     | PO2 |

9. a) An elevator weighing 5000N is ascending with an acceleration of 6 Marks L2 CO3 PO1  $3m/s^2$ . During this ascent, its operator whose weight is 700N is PO<sub>2</sub> 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? Explain D'Alembert's principle with neat example. 6 Marks L2 CO3 PO1 b) (**OR**) Compare and contrast between Simple and Compound 10 a) 6 Marks L2 CO<sub>4</sub> PO1 pendulums. A Weight of 50N is suspended from a spring, vibrates vertically b) 6 Marks L2 CO<sub>4</sub> PO1 with a frequency of 1 Hertz and amplitude of 7.5cm. Find the PO<sub>2</sub> stiffness of spring and maximum velocity.

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

## MATERIAL SCIENCE AND ENGINEERING

[ Mechanical Engineering ]

Time: 3 hours

Answer One Question from each Unit All questions carry equal marks

| 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<br>PO7 |
|    | b) | Define annealing and recall the types of annealing                                                                            | 6 Marks  | L1 | CO1 | PO1        |
|    | 0) | bernie ameaning and recar are types of ameaning.                                                                              | 0 marks  | 21 | 001 | 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;<br>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<br>PO7 |
|    | b) | Discuss on the characteristics and classification of polymers.                                                                | 6 Marks  | L1 | CO2 | PO3        |
| 10 |    | Define polymerization reaction and explain the types of polymerization reaction in detail.                                    | 12 Marks | L2 | CO2 | PO1<br>PO7 |

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Max. Marks: 60

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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** Max. Marks: 60 Time: 3 hours Answer One Question from each Unit All questions carry equal marks UNIT-I 1. Obtain complement of the Boolean Expression 6 Marks L3 CO1 **PO2** a) A'B + A'BC' + A'BCD.Convert the following numbers with the indicated bases to b) 6 Marks L3 CO1 PO1 decimal: i) (435)<sub>8</sub> ii) (345)<sub>6</sub> iii) (10110110)<sub>2</sub> (**OR**) Each of the following arithmetic operations is correct in at least 6 Marks CO1 **PO1** 2. a) L3 one number system. Determine the bases in each operation: ii) 23 + 44 + 14 + 32 = 223 i) 41/3 = 13Prove the following Boolean theorems: b) 6 Marks L3 CO1 **PO2** i) AB+A'C = (A+C)(A'+B). ii) AB+A'C+BC = AB+A'C. UNIT-II 3. Simplify the following Boolean function using K-Map method. 6 Marks L4 CO1 **PO2** a)  $F(w, x, y, z) = \Sigma(0, 2, 4, 5, 6, 7, 8, 10, 13, 15).$ Implement AND, OR, NOT gates using Universal gates. b) 6 Marks L3 CO1 **PO2** (**OR**) 4. Find the minterms of the following Boolean expressions by first L4 CO1 **PO2** a) 6 Marks plotting each function in map: xy + yz + xy'z. Minimize the expression using K-map and realize using only CO1 b) 6 Marks L4 PO3 NOR gates.  $F(A, B, C, D) = \Pi(1, 4, 5, 11, 12, 14)$  and don't care conditions d(A, B, C, D) = (6, 7, 15)(UNIT-III) With the help of a circuit diagram, explain the operation of series 5. 6 Marks L4 CO<sub>2</sub> **PO2** a) full adder and compare its performance with parallel adder. What is a multiplexer? Use a 4:1 multiplexer and a minimum b) 6 Marks L4 CO<sub>2</sub> PO5

function.  $F(w, x, y, z) = \sum m(3, 4, 5, 7, 10, 14) + \sum d(1, 6, 15)$ 

number of external gates to realize the following Boolean

(**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 | 6 Marks | L2 | CO2 | PO1 |
|    |    | D flip-flop.                                                      |         |    |     |     |
|    | b) | Design a 2-bit x 3-bit Binary Multiplier.                         | 6 Marks | L4 | CO2 | PO3 |

| 8  | a) | Design decade Johnson counter and explain its operation                                                                                | 6 Marks  | 14 | CO2 | PO3 |
|----|----|----------------------------------------------------------------------------------------------------------------------------------------|----------|----|-----|-----|
| 0. | b) | Define excitation table. Explain D flip-flop and obtain the state equation, the state diagram, state table and excitation table of the | 6 Marks  | L2 | CO2 | PO1 |
|    |    | same.                                                                                                                                  |          |    |     |     |
|    |    | UNIT-V                                                                                                                                 |          |    |     |     |
| 9. |    | A combinational circuit is defined by the functions                                                                                    | 12 Marks | L4 | CO2 | PO4 |
|    |    | $F_1(A, B, C) = \Sigma(3, 5, 6, 7)$                                                                                                    |          |    |     |     |
|    |    | $F_2(A, B, C) = \Sigma(0, 2, 4, 7)$                                                                                                    |          |    |     |     |
|    |    | Implement the circuit with a PLA having 3-inputs, four product                                                                         |          |    |     |     |
|    |    | terms and two outputs.                                                                                                                 |          |    |     |     |
|    |    | (OR)                                                                                                                                   |          |    |     |     |
| 10 | a) | Implement F (a, b, c, d) = $\Sigma$ 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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Time: 3 hours

### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

### **OBJECT ORIENTED PROGRAMMING THROUGH JAVA**

[Computer Science and Engineering, Information Technology,

Computer Science and Systems Engineering]

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<br>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 :                                                                           | 6 Marks    | L1  | CO2      | PO1 |
|    | ,          | i) Abstract class. ii) Final keyword with inheritance.                                            |            |     |          |     |
|    |            | 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                                             | 6 Marks    | L2  | CO2      | PO2 |
|    | <b>b</b> ) | Develop a java program to read 20 marks and store them in an                                      | 6 Marka    | Т 2 | $CO^{2}$ |     |
|    | 0)         | array Define your own exception named wrong mark exception                                        | 0 Iviai KS | LJ  | 002      | 105 |
|    |            | Throw and catch this type of exception when a mark is                                             |            |     |          |     |
|    |            | (<0  and >100)                                                                                    |            |     |          |     |
|    |            |                                                                                                   |            |     |          |     |
| 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                                          | 6 Marks    | L3  | CO3      | PO5 |
|    | - )        | parameter message from the html file and display it on the webpage                                |            | -   |          |     |
|    |            | (OR)                                                                                              |            |     |          |     |
| 10 | a)         | Construct an anonymous inner class for handling mouse entered                                     | 6 Marks    | 13  | CO3      | PO3 |
| 10 | uj         | events into an Applet                                                                             | U ITUIND   |     | 005      | 105 |
| •  | b)         | List and explain any three Swing GUI components.                                                  | 6 Marks    | L2  | CO3      | PO1 |
|    | - )        | r                                                                                                 |            |     |          |     |

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#### 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 | 3 hours                                                                                                                                           | Max. Marks: 70 |          |     |     |
|----|---------|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------|-----|-----|
|    |         | Answer One Question from each Unit<br>All questions carry equal marks                                                                             |                |          |     |     |
|    |         |                                                                                                                                                   |                |          |     |     |
| 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<br>in it. Describe briefly the significance of $\Psi$ and $\Psi^2$                 | 7 Marks        | L1       | CO2 | PO1 |
|    | b)      | List the salient features of molecular orbital theory.                                                                                            | 7 Marks        | L1       | CO2 | PO2 |
| 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 |
| 6  | a)      | ( <b>UK</b> )<br>Explain construction and working of any lithium ion battery                                                                      | 7 Marks        | 12       | CO3 | PO1 |
| 0. | b)      | Differentiate between dry corrosion and wet corrosion with an example each.                                                                       | 7 Marks        | L2<br>L4 | CO3 | PO2 |
|    |         |                                                                                                                                                   |                |          |     |     |
| 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 $\pi$ -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) | <ul> <li>Distinguish the following pairs of properties of lubricants:</li> <li>i) Flash points and Fire point</li> <li>ii) Cloud point and Pour point</li> </ul> |         | L4 | CO5 | PO1 |

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SVEC-20 Roll No.

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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

| Т  | ime: 3   | hours                                                                                                                                                                                                                                                                                       |                     | Max.     | Marks: 7   | 70         |
|----|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------|------------|------------|
|    |          | Answer One Question from each Unit                                                                                                                                                                                                                                                          |                     |          |            |            |
|    |          | All questions carry equal marks                                                                                                                                                                                                                                                             |                     |          |            |            |
|    |          |                                                                                                                                                                                                                                                                                             |                     |          |            |            |
| 1. | a)       | Derive an expression for condition of maxima and minima for<br>reflected light in case of thin transparent film of uniform<br>thickness                                                                                                                                                     | 10 Marks            | L1       | CO1        | PO2        |
|    | b)       | List out the conditions for obtaining the interference pattern.<br>(OR)                                                                                                                                                                                                                     | 4 Marks             | L2       | CO1        | PO1        |
| 2. | a)<br>b) | Describe the construction and working of a Nicol Prism<br>Plane polarized light passes through a double refracting crystal of<br>thickness 40µm and emerges out as circularly polarized light .If<br>the birefringence of crystal is 0.00004, find the wavelength of the<br>incident light. | 10 Marks<br>4 Marks | L2<br>L3 | CO1<br>CO1 | PO2<br>PO1 |
| 3. | a)       | Identify four Maxwell's field equations along with their physical                                                                                                                                                                                                                           | 8 Marks             | L3       | CO2        | PO2        |
|    | b)       | Outline the divergence and curl of electric and magnetic fields.                                                                                                                                                                                                                            | 6 Marks             | L2       | CO2        | PO1        |
| 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        |
| 5. | a)<br>b) | Differentiate direct and indirect band semiconductors.<br>Derive an expression for concentration of holes in intrinsic semiconductors.                                                                                                                                                      | 4 Marks<br>10 Marks | L2<br>L3 | CO3<br>CO3 | PO2<br>PO1 |
|    |          | (OR)                                                                                                                                                                                                                                                                                        |                     |          |            |            |
| 6. | a)<br>b) | Explain construction and working of semiconductor diode laser.<br>Describe the formation of pn-junction.                                                                                                                                                                                    | 8 Marks<br>6 Marks  | L2<br>L2 | CO3<br>CO3 | PO2<br>PO1 |
| 7. | a)       | Develop the theory and expression for Lorenz field experienced<br>by an atom in a dielectric material                                                                                                                                                                                       | 10 Marks            | L3       | CO4        | PO2        |
|    | b)       | Describe the dielectric breakdown and the piezoelectric effect.<br>(OR)                                                                                                                                                                                                                     | 4 Marks             | L2       | CO4        | PO1        |
| 8. | a)<br>b) | Extend the theory of hysteresis of fero - magnetic materials.<br>Distinguish between soft and hard magnetic materials.                                                                                                                                                                      | 7 Marks<br>7 Marks  | L2<br>L4 | CO4<br>CO4 | PO1<br>PO1 |
| 9. | a)       | <b>UNIT-V</b><br>Explain critical parameters of superconductors and Josephson                                                                                                                                                                                                               | 8 Marks             | L2       | CO5        | PO2        |
|    | b)       | effect.<br>Discuss the BCS theory of superconductors.                                                                                                                                                                                                                                       | 6 Marks             | L2       | CO5        | PO1        |
|    | - )      | (OR)                                                                                                                                                                                                                                                                                        |                     |          |            | ~ •        |
| 10 | a)<br>b) | Discuss the properties of Nano materials.<br>Explain the synthesis of Nano material by PLD method.                                                                                                                                                                                          | 8 Marks<br>6 Marks  | L2<br>L2 | CO5<br>CO5 | PO1<br>PO2 |
|    | ,        |                                                                                                                                                                                                                                                                                             |                     |          |            |            |

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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

#### **APPLIED PHYSICS**

[ Mechanical Engineering ]

Time: 3 hours Max. Marks: 70 **Answer One Ouestion from each Unit** All questions carry equal marks UNIT-I Summarize the classification of an optical fibre based on 10 Marks L2 CO1 **PO1** 1. a) refractive index profile and modes of propagation with neat sketches. List any four applications of optical fibres. b) 4 Marks L3 CO1 PO2 (**OR**) 2. Explain the principle of operation of optical fiber. Draw a 9 Marks L2 CO1 PO1 a) schematic layout of a step index optical fiber. A step index fiber has a core of refractive index 1.5. If the L3 CO1 b) 5 Marks PO<sub>2</sub> numerical aperture of the fiber is 0.26, calculate the refractive index of the cladding material. UNIT-II Derive Sabine's formula for reverberation time. Write its 9 Marks 3. L2 CO<sub>2</sub> PO1 a) drawbacks. PO2 The reverberation time is found to be 2.4 sec for an empty hall, L3 CO<sub>2</sub> PO2 b) 5 Marks 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. (**OR**) Explain the principle, construction and working of production of 4. 10 Marks L2 CO<sub>2</sub> PO1 a) ultrasonic waves using piezoelectric method. A X-cut piezoelectric crystal plane has a thickness of 1.6mm. L3 CO<sub>2</sub> b) 4 Marks **PO2** The velocity of propagation of sound waves along the x-direction is 5760m/sec. Calculate the fundamental frequency of the crystal. UNIT-III) If a body is thrown horizontally into space, find the path traced 5. 7 Marks L2 CO3 PO2 a) by that body mathematically. Sketch the displacement Vs time curve, velocity Vs time curve b) 7 Marks L3 CO3 PO2 and acceleration Vs time curve of a body travelling in a straightline path and give your inferences. (**OR**) Assume that a wheel is acted upon by torque, derive an 6. a) 7 Marks L1 CO3 PO1 expression for moment the wheel undergoes, if the body rotates about its own axis with an acceleration " $\alpha$ ". Derive an expression for work energy equation for a body of 7 Marks L2 CO<sub>3</sub> PO1 b) weight W undergoing a translation motion. PO2 UNIT-IV 7. Explain in detail a technique to find the thermal conductivity of a) 8 Marks L2 CO4 PO1 bad conductor. Explain in detail different modes of heat transfer. 6 Marks L2 CO4 PO1 b) PO2

|    |     | (OR)                                                             |          |     |     |     |
|----|-----|------------------------------------------------------------------|----------|-----|-----|-----|
| 8. |     | Derive an expression for heat conducted through compound         | 14 Marks | L2  | CO4 | PO1 |
|    |     | media when the materials are connected in series.                |          |     |     |     |
|    |     | UNIT-V                                                           |          |     |     |     |
| 9. | a)  | Explain the preparation of metallic glass by RF sputtering       | 10 Marks | L2  | CO5 | PO1 |
|    |     | technique. Write its advantage over other techniques.            |          |     |     |     |
|    | 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 | 9 Marks  | L2  | CO5 | PO1 |
| •  | 1 \ | snape memory anoys.                                              | 5 ) ( 1  | т о | 005 |     |
|    | b)  | List the properties of Nili alloy.                               | 5 Marks  | L3  | CO5 | POI |
|    |     |                                                                  |          |     |     | PO2 |

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Time: 3 hours

|          |  |  |  | <br>SVI | EC- | 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

#### **COMMUNICATIVE ENGLISH**

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

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                                  | 7 Marks    | L6   | CO2 | PO1  |
|    | b)       | Identify the differences between 'postures' and 'gestures' in<br>Nerverbal communication | 7 Marks    | L3   | CO4 | PO5  |
|    |          |                                                                                          |            |      |     |      |
| 2  |          |                                                                                          | 1434 1     | 1.0  | 000 | DOO  |
| 3. |          | Illustrate the traits of a good listener.                                                | 14 Marks   | L2   | CO2 | PO2  |
| 4  | ``       | $(\mathbf{OR})$                                                                          |            | т. с | 000 |      |
| 4. | a)       | Sometimes, it is necessary to be a Passive listener.' Justify the statement.             | / Marks    | L5   | CO2 | POI  |
|    | b)       | What signals can you identify among listeners during the stage of Empathetic listening?  | 7 Marks    | L1   | CO2 | PO2  |
|    |          |                                                                                          |            |      |     |      |
| 5  |          | Explain 'Paralinguistic features' in detail                                              | 14 Marke   | 12   | CO1 | PO1  |
| 5. |          |                                                                                          | 14 Iviaiks | L    | COI | 101  |
| 6  | a)       | Discuss the role of 'Confidence' in one's communication and                              | 7 Marks    | 16   | CO4 | PO10 |
| 0. | a)       | presentation.                                                                            |            | LU   | 04  | 1010 |
|    | b)       | 'Awareness of Intercultural differences plays a significant role in                      | 7 Marks    | L3   | CO4 | PO10 |
|    |          | communication.' Develop the statement meaningfully.                                      |            |      |     |      |
|    |          | (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 SO3R Reading technique is a widely used                                 | 7 Marks    | L1   | CO3 | PO5  |
|    | - )      | reading technique? Discuss.                                                              |            |      |     |      |
|    |          | (UNIT-V)                                                                                 |            |      |     |      |
| 0  |          | Classify the types of Essays and explain them in detail                                  | 14 Marks   | τ 4  | CO1 | PO1  |
| 9. |          | (OP)                                                                                     | 14 Iviaiks | L4   | COI | 101  |
| 10 | a)       | (UN)<br>What are the Characteristic features of an Essay? Evaluin                        | 7 Marka    | T 1  | CO1 |      |
| 10 | a)<br>b) | Identify the steps to elaborate to produce an officiative Presis                         | 7 Marks    |      | CO1 |      |
| •  | UJ       | writing.                                                                                 | / IVIAIKS  | LJ   | COS | ros  |

(P) (P) (P)



#### 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 Define an even function and give an example. Obtain Fourier 1. 7 Marks L3 CO1 PO1 a) series for the function $f(x) = x^2$ in $(-\pi, \pi)$ . Express $f(x) = \begin{cases} 1, & 0 < x < \pi \\ 0, & > \pi \end{cases}$ as a Fourier sine integral and b) 7 Marks L1 CO1 PO1 hence, evaluate $\int_0^\infty \frac{1 - \cos \pi \lambda}{\lambda} \sin x \lambda \, d\lambda$ . (**OR**) 2. Find the half-range sine series of 7 Marks L1 CO1 PO1 a) $f(x) = \begin{cases} kx, & 0 < x < \frac{\pi}{2} \\ k(\pi - x), & \frac{\pi}{2} < x < \pi \end{cases} \quad in \ 0 < x < \pi \ .$ Find the Fourier sine transform of b) 7 Marks L1 PO1 CO1 $f(x) = \frac{e^{-ax}}{x}$ and deduce that $\int_0^\infty \frac{e^{-ax} - e^{-bx}}{x} \sin sx \, dx = \tan^{-1} \left(\frac{s}{a}\right) - \tan^{-1} \left(\frac{s}{b}\right).$ UNIT-II Using Laplace transform, evaluate $\int_0^\infty \frac{e^{-2t} \sin^2 t}{t} dt$ 3. 7 Marks L3 CO<sub>2</sub> PO2 a) Find the Laplace transform of the triangular wave of period 2a 7 Marks L1 CO<sub>2</sub> PO1 b) given by $f(t) = \begin{cases} t & 0 < t < a \\ 2a - t, & a < t < 2a \end{cases}$ (**OR**) Find the Laplace transform of $f(t) = t^2 e^{-2t} \cos t$ . 4. 7 Marks L1 CO<sub>2</sub> PO1 a) Define unit step function and find its Laplace transform. Find b) 7 Marks L1 CO<sub>2</sub> PO1 Laplace transform of $f(t) = e^{-2t} \{1 - u(t-1)\}$ .

|    |                                                     | (UNIT-III)                                                                                                                                                                                                                                                                                                    |          |     |     |     |  |  |  |  |  |
|----|-----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----|-----|-----|--|--|--|--|--|
| 5. | a)                                                  | Apply convolution theorem, find the inverse Laplace transform $\frac{1}{2}$                                                                                                                                                                                                                                   | 7 Marks  | L5  | CO2 | PO2 |  |  |  |  |  |
|    | <b>b</b> )                                          | of the function $\frac{s^2}{(s^2 + a^2)(s^2 + b^2)}$ , $a \neq b$ .                                                                                                                                                                                                                                           | 7 Mortes | Т 1 | CO2 |     |  |  |  |  |  |
|    | 0)                                                  | Find $L^{-1} \left\{ \frac{e^{-2s}}{s^2 + 4s + 5} \right\}$ .                                                                                                                                                                                                                                                 | / WIAIKS | LI  | 002 | PUI |  |  |  |  |  |
|    |                                                     | (OR)                                                                                                                                                                                                                                                                                                          |          |     |     |     |  |  |  |  |  |
| 6. |                                                     | Solve the differential equation $\frac{d^2x}{dt^2} + 9x = \sin t$ , using Laplace                                                                                                                                                                                                                             | 14 Marks | L3  | CO2 | PO2 |  |  |  |  |  |
|    | transform, given that $x(0) = 1$ , $x(\pi/2) = 1$ . |                                                                                                                                                                                                                                                                                                               |          |     |     |     |  |  |  |  |  |
| 7. |                                                     | $\begin{bmatrix} 1 & 2 & 3 & 0 \\ 2 & 4 & 3 & 2 \end{bmatrix}$                                                                                                                                                                                                                                                | 7 Marks  | L1  | CO3 | PO2 |  |  |  |  |  |
|    | a)                                                  | Find the rank of the matrix $A = \begin{bmatrix} 2 & 1 & 2 & 2 \\ 3 & 2 & 1 & 3 \\ 6 & 8 & 7 & 5 \end{bmatrix}$ by reducing it to                                                                                                                                                                             |          |     |     |     |  |  |  |  |  |
|    |                                                     | echelon form.                                                                                                                                                                                                                                                                                                 |          |     |     |     |  |  |  |  |  |
|    | b)                                                  | Are the systems of equations consistence? If so, solve them.<br>x + y + 2z + w = 5; $2x + 3y - z - 2w = 2$ ; $4x + 5y + 3z = 7$ .                                                                                                                                                                             | 7 Marks  | L3  | CO3 | PO2 |  |  |  |  |  |
| 8. |                                                     | $\begin{bmatrix} 0 & 1 & 1 \end{bmatrix}$                                                                                                                                                                                                                                                                     | 14 Marks | L3  | CO3 | PO2 |  |  |  |  |  |
|    |                                                     | Is the matrix $A = \begin{bmatrix} 1 & 0 & 1 \\ 1 & 1 & 0 \end{bmatrix}$ diagonalizable? If so, find the                                                                                                                                                                                                      |          |     |     |     |  |  |  |  |  |
|    |                                                     | model matrix and diagonal matrix.                                                                                                                                                                                                                                                                             |          |     |     |     |  |  |  |  |  |
| 9. | a)                                                  | Determine whether or not the vectors $(1, -2, 6)$ , $(3, 2, 7)$ , $(2, 4, 1)$<br>in R <sup>3</sup> are linearly dependent. If so find the relationship between<br>them                                                                                                                                        | 7 Marks  | L4  | CO4 | PO2 |  |  |  |  |  |
|    | b)                                                  | Find the rank and nullity of the linear transformation $T : \mathbb{R}^2 \to \mathbb{R}^3$<br>([a-b])                                                                                                                                                                                                         | 7 Marks  | L1  | CO4 | PO1 |  |  |  |  |  |
|    |                                                     | defined by $T\left(\begin{bmatrix}a\\b\end{bmatrix}\right) = \begin{bmatrix}a+b\\b\end{bmatrix}$ .                                                                                                                                                                                                            |          |     |     |     |  |  |  |  |  |
| 10 | a)                                                  | (OR)<br>Show that the set $B = \{1 + x, x + x^2, 1 + x^2\}$ is a basis for the                                                                                                                                                                                                                                | 7 Marks  | L2  | CO4 | PO1 |  |  |  |  |  |
|    | b)                                                  | vector space P <sub>2</sub> of all polynomials of degree at most 2 over R.<br>Determine matrix of the linear transformation $T : P_2 \rightarrow P_2$ defined<br>by $T(p(x)) = p(x + 2)$ with respect to the basis $B = \{1, x, x^2\}$ ,<br>here P is the vector space of all polynomials of degree at most 2 | 7 Marks  | L3  | CO4 | PO2 |  |  |  |  |  |
|    |                                                     | here $r_2$ is the vector space of an polynomials of degree at most 2.                                                                                                                                                                                                                                         |          |     |     |     |  |  |  |  |  |

Time: 3 hours

SVEC-20

SREE VIDYANIKETHAN ENGINEERING COLLEGE

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

#### **BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**

#### [ Civil Engineering, Computer Science and Business Systems ]

Max. Marks: 70

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

## UNIT-I

1. a) Find the current in 50hm resistor from the circuit diagram given 8 Marks L3 CO1 PO2 below:



|    | b)       | Discuss briefly about the phasor representation of a sinusoidal waveform.                          | 6 Marks   | L2  | COI    | 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:                                                                        | 6 Marks   | L2  | CO2    | PO2 |
|    |          | i) Power factor. ii) Reactive power. iii) Apparent power.                                          |           |     |        |     |
|    |          | 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                                        | 8 Marks   | L2  | CO2    | PO7 |
|    | h)       | Write short notes on:                                                                              | 6 Marks   | 12  | $CO^2$ | PO2 |
|    | 0)       | i) BEE standards ii) ELCB iii) Relay                                                               | 0 IviaiKS | 1.4 | 002    | 102 |
|    |          |                                                                                                    |           |     |        |     |
| 5  | a)       | Explain in detail about working of a single phase transformer                                      | 6 Marka   | 13  | CO4    | PO2 |
| 5. | a)<br>b) | Differentiate resistor start and canacitor start single phase                                      | 8 Marks   |     | CO4    | PO2 |
|    | 0)       | induction motor                                                                                    | 0 IVIAIRS |     | 004    | 102 |
|    |          | (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:                                          | 4 Marks  | L2 | CO4 | PO2 |
|    |    | i) Ripple factor. ii) Peak Inverse Voltage.                          |          |    |     |     |
|    |    | (OR)                                                                 |          |    |     |     |
| 8. | a) | Explain the working principle of a Zener diode in forward and        | 8 Marks  | L2 | CO2 | PO1 |
|    |    | reverse bias conditions and draw its V-I characteristics.            |          |    |     |     |
|    | 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            | 7 Marks  | L2 | CO2 | PO2 |
|    | ,  | Op-Amp with a neat sketch.                                           |          |    |     |     |
|    | b) | Illustrate the differentiator circuit with a neat diagram and derive | 7 Marks  | L2 | CO2 | PO1 |
|    |    | the output voltage.                                                  |          |    |     |     |
|    |    | (OR)                                                                 |          |    |     |     |
| 10 | a) | Write short notes on:                                                | 8 Marks  | L2 | CO2 | PO2 |
|    |    | i) Operational Amplifier. ii) Comparator circuit.                    |          |    |     |     |
|    | b) | Illustrate various applications of an Op-Amp.                        | 6 Marks  | L2 | CO2 | PO2 |

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|    | CODE      | No.: 20BT20101                                                                                                                  | · · · · · · | ·        | SVE      | C-20                                                  |
|----|-----------|---------------------------------------------------------------------------------------------------------------------------------|-------------|----------|----------|-------------------------------------------------------|
|    |           | Roll No.                                                                                                                        |             |          |          |                                                       |
|    |           | SREE VIDYANIKETHAN ENGINEERING CO                                                                                               |             |          |          |                                                       |
|    |           | I B.Tech II Semester (SVEC-20) Regular Examinations                                                                             | sentember   | r – 202  | 21       |                                                       |
|    |           | CIVIL ENCINEEDING MATERIALS AND CONCRETE                                                                                        | теснио      |          |          |                                                       |
|    |           |                                                                                                                                 | TECHNO      | LUGI     |          |                                                       |
|    | Time: 3   | [ Civit Engineering ]                                                                                                           |             | Max.     | Marks:   | 70                                                    |
|    | 1 milet ( | Answer One Question from each Unit<br>All questions carry equal marks                                                           |             |          |          |                                                       |
|    |           |                                                                                                                                 |             |          |          |                                                       |
| 1. | a)        | Explain the various factors that cause deterioration of stone work<br>and the preservation of stones.                           | 8 Marks     | L4       | CO1      | PO1                                                   |
|    | b)        | Explain any two laboratory tests on bricks.                                                                                     | 6 Marks     | L4       | CO1      | PO1<br>PO2<br>PO4<br>PO5<br>PO6<br>PO7<br>PO8<br>PO10 |
|    |           | (OR)                                                                                                                            |             |          |          | 1010                                                  |
| 2. | a)        | Explain dressing of stones and what are the requirements of good building stones.                                               | 7 Marks     | L3       | CO1      | PO1<br>PO5<br>PO6                                     |
|    | b)        | List out the types of tiles.                                                                                                    | 7 Marks     | L4       | CO1      | PO7<br>PO1<br>PO8                                     |
|    |           | UNIT-II)                                                                                                                        |             |          |          |                                                       |
| 3. | a)        | Explain the qualities of a good timber.                                                                                         | 7 Marks     | L4       | CO2      | PO1<br>PO5<br>PO6<br>PO7<br>PO8                       |
|    | b)        | Give a brief description of the process of painting on different surfaces.                                                      | 7 Marks     | L4       | CO2      | PO1<br>PO2<br>PO7<br>PO12                             |
| Δ  | а)        | (UR)<br>What are the materials used for construction                                                                            | 7 Marks     | ТЛ       | $CO^{2}$ | P∩1                                                   |
| 4. | a)<br>b)  | How do you select the materials and sizes of forms for construction work?                                                       | 7 Marks     | L4<br>L4 | CO2      | PO1                                                   |
| 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<br>PO5<br>PO8                                     |
|    | b)        | What are the properties of good aggregates for making concrete<br>and discuss in brief various tests carried out on aggregates. | 7 Marks     | L4       | CO3      | PO1<br>PO5<br>PO8                                     |
|    |           | (OR)                                                                                                                            |             |          |          | 100                                                   |

| 6.  | a) | Explain how do you determine moisture content of aggregate.                                                                                                                                                                                                              | 7 Marks  | L4 | CO3 | PO1<br>PO2                             |
|-----|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----|-----|----------------------------------------|
|     | b) | Write about sieve analysis.                                                                                                                                                                                                                                              | 7 Marks  | L4 | CO3 | PO1<br>PO2                             |
| 7.  | a) | What is segregation and bleeding of concrete why they occur, discuss how to prevent them.                                                                                                                                                                                | 7 Marks  | L4 | CO4 | PO1<br>PO5<br>PO8                      |
|     | b) | Write short notes on Ultrasonic pulse velocity test.                                                                                                                                                                                                                     | 7 Marks  | L4 | CO4 | PO1<br>PO5<br>PO8                      |
|     |    | (OR)                                                                                                                                                                                                                                                                     |          |    |     | 100                                    |
| 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°C and night time at 10°C. | 7 Marks  | L4 | CO4 | PO1                                    |
|     | b) | Explain about factors affecting the compressive strength of concrete.                                                                                                                                                                                                    | 7 Marks  | L4 | CO4 | PO1<br>PO7                             |
|     |    | UNIT-V                                                                                                                                                                                                                                                                   |          |    |     |                                        |
| 9.  | a) | What is shrinkage of concrete? Explain the various factors affecting shrinkage of concrete.                                                                                                                                                                              | 7 Marks  | L4 | CO5 | PO1<br>PO7                             |
|     | b) | How does strength of concrete influence the modulus of elasticity<br>and Poisson's ratio of concrete?                                                                                                                                                                    | 7 Marks  | L4 | CO5 | PO1<br>PO2                             |
|     |    | (OR)                                                                                                                                                                                                                                                                     |          |    |     |                                        |
| 10. |    | Explain in detail the various steps involved in designing concrete mixes using IS 10262 method.                                                                                                                                                                          | 14 Marks | L4 | CO6 | PO1<br>PO2<br>PO3<br>PO4<br>PO5<br>PO6 |
|     |    |                                                                                                                                                                                                                                                                          |          |    |     | PO7                                    |
|     |    |                                                                                                                                                                                                                                                                          |          |    |     | PO8                                    |

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SVEC-20

Roll No.

## SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### **ELECTRICAL CIRCUITS**

#### [Electrical and Electronics Engineering]

Time: 3 hours Max. Marks: 70 **Answer One Question from each Unit** All questions carry equal marks

## UNIT-I

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



(**OR**)

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



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



L3 CO1 PO4

## UNIT-II

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

L2

CO<sub>2</sub>

PO<sub>2</sub>



- (**OR**)
- 4. a) In a particular RL series circuit, a voltage of 10V at 50Hz 7 Marks L6 CO2 PO3 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?
  - b) A series RLC circuit consists of a resistance of  $1k\Omega$ , an 7 Marks L3 CO2 PO2 inductance of 10mH and a capacitance of  $100\mu$ F. For a supply voltage of 100 V, determine the following:
    - i) Resonant frequency. ii) Q-Factor of the circuit.
    - iii) Half-power frequencies.

6.

## (UNIT-III)

5. a) Use the superposition theorem and determine the value of 7 Marks L3 CO3 PO5 voltageV<sub>x</sub> in the given circuit.



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



a) Obtain the Thevenin's equivalent circuit and find the current 7 Marks L3 CO3 PO5 through  $2\Omega$  resistor connected between terminals A and B in the



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



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

(OR)

- 8. a) Explain the measurement of 3-phase active and reactive powers 7 Marks L2 CO4 PO2 using two watt meter method with a neat phasor diagram.
  b) Three coils each with a resistance of 10Ω and reactance of 10Ω 7 Marks L3 CO4 PO2
  - b) Three coils each with a resistance of  $10\Omega$  and reactance of  $10\Omega$  7 Marks 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.

9. a) Determine the equivalent inductance of two coils with self- 7 Marks L2 CO5 PO2 inductances L<sub>1</sub>, L<sub>2</sub> and mutual inductance M are connected in parallel aiding and parallel opposing.
b) Find the equivalent inductance between the terminals across XY 7 Marks L4 CO5 PO2



(OR)

10 a) Explain the dot convention used in magnetically coupled circuits 7 Marks L2 CO5 PO1 . with the help of suitable examples.

7 Marks

L3

CO5

PO3

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.

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#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

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#### 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

CO1

PO2

#### 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 b) Determine the current through 100 resistor in the fig below 7 Marks L4
  - b) Determine the current through  $10\Omega$  resistor in the fig below 7 Marks L4 CO1 PO2 using mesh analysis.



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



b) Find Vx for the circuit shown below.



7 Marks L4 CO1 PO2

3. a) Derive expression for bandwidth of series resonance circuit. 7 Marks L2 CO1 PO2 b) In a series RLC circuit with  $R = 10 \Omega$ , L = 0.1 H and  $C = 50 \mu$ F, 7 Marks L3 CO2 PO2 find resonant frequency, quality factor and band width. 4. a) A series connected load draws a current  $I(t) = 4\sin(100\pi t)A$  7 Marks L4 CO1 PO2 when the applied voltage is  $V(t) = 120 \sin(100\pi t)V$ . Find the power factor.

(**OR**)

b) Design a series RLC circuit that resonates at 1.5kHz and 7 Marks L3 CO2 PO2 consumes 50W from a 50V A.C source operating at the resonance frequency. The bandwidth is 0.75kHz.

## UNIT-III

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



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

7 Marks

L3

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 7 Marks L4 CO1 PO2
2 at t= 0, find current i.



(OR)

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



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



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

L4 CO2 PO5



(OR)

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



(P) ÷ (f) Time: 3 hours

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7 Marks

7 Marks

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

#### **BASIC ENGINEERING MECHANICS**

#### [ Mechanical Engineering ]

Max. Marks: 70

CO1

CO1

L3

L4

PO1

PO6

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

#### UNIT-I

- State and prove Lami's theorem. 1. a)
  - Resolve each force acting on the post into its x and y components b) and determine the magnitude and direction of resultant force.



(**OR**)

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



3 a) State and explain varignon's thorem.

b)

7 Marks L3 CO<sub>2</sub> **PO1** Determine the axial force in each bar of the plane truss loaded as 7 Marks L4 CO<sub>2</sub> PO<sub>2</sub>

shown in the figure. 3 m 3 m 1.5 m 1 1.5 m 2

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



- 5. a) State the laws of dry friction.
  - 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.

4 Marks L3 CO3 PO1 10 Marks L4 CO3 PO3



- 6. a) Define wedge and write the equilibrium conditions for ladder 4 Marks L3 CO3 PO1 friction.
  b) Determine the minimum horizontal force to be applied at A to 10 Marks L4 CO3 PO2
  - b) Determine the minimum horizontal force to be applied at A to 10 Marks 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.





## UNIT-IV

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



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



| 9. | a) | Find amplitude and time period of a particle moving with SHM,    | 8 Marks | L4 | CO4 | PO1 |
|----|----|------------------------------------------------------------------|---------|----|-----|-----|
|    |    | which has a velocity of 9m/s and 16 m/s at the distance of 3m    |         |    |     |     |
|    |    | and 4m respectively from the centre.                             |         |    |     |     |
|    | b) | A mass of 2 kg is supported on as isolator having a spring scale | 6 Marks | L4 | CO4 | PO3 |
|    |    | 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.      |         |    |     |     |
|    |    | (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     | 6 Marks | L4 | CO4 | PO3 |
|    |    | m and a period of oscillation of 2 seconds. What will be its     |         |    |     |     |
|    |    | velocity and acceleration 0.4 seconds after passing an extreme   |         |    |     |     |
|    |    | position?                                                        |         |    |     |     |
|    |    |                                                                  |         |    |     |     |

(B) ÷ (f)

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|----|------------|----------------------------------------------------------------------|--------------------------|-----------------|----------|------------|
|    |            | Roll No.                                                             |                          |                 |          |            |
|    |            | SREE VIDYANIKETHAN ENGINEERING COI                                   | LEGE                     |                 |          |            |
|    |            | (An Autonomous Institution, Affiliated to JNTUA, Ananthapur          | amu)                     | • • •           |          |            |
|    |            | <b>I B.Tech II Semester (SVEC-20) Regular Examinations</b>           | September                | -202            | 1        |            |
|    |            | DIGITAL LOGIC DESIGN                                                 | -hh                      |                 |          |            |
|    |            | Computer Science and Engineering, Information 16                     | eennology,               | inaanir         | NG       |            |
|    |            | (Artificial Intelligence) Computer Science and Engineering           | ce anu Eng<br>(Data Scia | meern<br>nco) l | ig       |            |
| ,  | T:         | (Artificial Intelligence), Computer Science and Engineering          | , (Data Stit             | Man             | Maulant  | 70         |
|    | i inte: 5  | Answer One Question from each Unit                                   |                          | Iviax.          | Marks:   | 10         |
|    |            | All questions carry equal marks                                      |                          |                 |          |            |
|    |            |                                                                      |                          |                 |          |            |
| 1  | a)         | Express the following numbers in decimal:                            | 6 Marks                  | 13              | CO1      | PO1        |
| 1. | a)         | i) (26.24)8 ii) (16.5)16.                                            | 0 WIAIKS                 | LJ              | COI      | 101        |
|    | b)         | Perform the following subtraction in binary using 1's and 2's        | 8 Marks                  | L3              | CO1      | PO1        |
|    | ŕ          | complement method: $(677)10 - (899)10$ .                             |                          |                 |          |            |
|    |            | (OR)                                                                 |                          |                 |          |            |
| 2. | a)         | Implement the following Boolean function with only two input         | 7 Marks                  | L3              | CO1      | PO1        |
|    | <b>b</b> ) | NOR gates: F=(AB'+CD')E+BC(A+B).                                     | 7 Marka                  | 12              | CO1      |            |
|    | 0)         |                                                                      | / WIAIKS                 | LZ              | COI      | rui        |
| 2  | a)         | Implement the following Realean function with only two input         | 7 Marka                  | τ 4             | $CO^{2}$ | DOJ        |
| 5. | a)         | NAND gates: $F=(AB'+D')E+C(A'+B')$                                   | / WIAIKS                 | L4              | 002      | r02        |
|    | b)         | Simplify the following Boolean function with the don't               | 7 Marks                  | L4              | CO2      | PO2        |
|    | ,          | conditions d using Kmap method: $F(A, B, C, D)=\Sigma(1,3,8,10,15);$ |                          |                 |          |            |
|    |            | $d(A, B, C, D) = \Sigma(0, 2, 9).$                                   |                          |                 |          |            |
|    | ``         | (OR)                                                                 | 7)(1                     | т 4             | 000      | DOO        |
| 4. | a)         | Simplify the following using K-map and implement the same            | / Marks                  | L4              | 002      | PO2        |
|    |            | using NAND gates.<br>$Y (A \ B \ C) = \sum (0 \ 3 \ 4 \ 5 \ 7)$      |                          |                 |          |            |
|    | b)         | Reduce the following Boolean function to four literals and draw      | 7 Marks                  | L4              | CO2      | PO2        |
|    | -)         | the logic diagram: $(A'+C)(A'+C')(A+B+C'D)$ .                        | ,                        |                 |          |            |
|    |            | (UNIT-III)                                                           |                          |                 |          |            |
| 5. | a)         | Define Combinational Circuit. Explain Design Procedure for           | 7 Marks                  | L2              | CO3      | PO3        |
|    |            | Combinational Circuit.                                               |                          |                 |          |            |
|    | b)         | Implement full adder using decoder and OR gates.                     | 7 Marks                  | L4              | CO3      | PO3        |
| (  | ``         | (OR)                                                                 |                          | та              | 001      | DOI        |
| 6. | a).        | Design a 1:8 demultiplexer using two 1:4 demultiplexer.              | / Marks<br>7 Marks       | L4<br>L4        | CO3      | PO3        |
|    | 0).        |                                                                      | / WIAIKS                 | L4              | COS      | rus        |
| 7  | c)         | Convert W flin flor to T flin flor                                   | 7 Manlar                 | 10              | CO4      |            |
| 1. | a)         | Draw the logic diagram of a IK flip-flop and using excitation        | 7 Marks                  |                 | C04      | PO4<br>PO4 |
|    | 0)         | table explain its operation                                          | / WIAIKS                 | LŦ              | 04       | 104        |
|    |            | (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        |

(OR) 10 Implement the following Boolean functions using PLA. 14 Marks  $A(x,y,z)=\sum(1,2,4,6); B(x,y,z)=\sum(0,1,6,7); C(x,y,z)=\sum(2,6).$ 

Compare PROM, PLA and PAL.

b)

CO5

CO5

PO5

PO5

L2

L4

6 Marks

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|          | <br>- | - |  | SVI | EC- | 20 |
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| 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 ]

| Ί  | 'ime: 3 | hours                                                                                                 |          | Max. | Marks: 7 | 70  |
|----|---------|-------------------------------------------------------------------------------------------------------|----------|------|----------|-----|
|    |         | Answer One Question from each Unit<br>All questions carry equal marks                                 |          |      |          |     |
|    |         |                                                                                                       |          |      |          |     |
| 1  | a)      | Compare and contrast flowchart and algorithm                                                          | 7 Marks  | L4   | CO1      | PO1 |
|    | b)      | Write an algorithm, find the sum of the given <b>n</b> numbers.<br>(OR)                               | 7 Marks  | L3   | CO1      | PO2 |
| 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 |
| 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.<br>(OR)                                              | 7 Marks  | L3   | CO3      | PO4 |
| 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 |
|    |         |                                                                                                       |          |      |          |     |

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

SVEC-20 Roll No.

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

## DATA STRUCTURES AND ALGORITHMS

#### [ Computer Science and Business Systems ]

| ]  | Max. | Max. Marks: 70                                                                                                        |          |     |             |             |
|----|------|-----------------------------------------------------------------------------------------------------------------------|----------|-----|-------------|-------------|
|    |      |                                                                                                                       |          |     |             |             |
|    |      | 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         |
| 2  | -)   | (OR)                                                                                                                  | 0 Maulaa | 10  | <b>CO</b> 2 | <b>DO</b> 2 |
| Ζ. | a)   | complexity.                                                                                                           | 8 Marks  | L2  | 002         | 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         |
| 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         |
| 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.                             | 7 Marks  | L4  | CO5         | PO2         |
|    |      | Preorder Sequence: A B D G H C E F I K J                                                                              |          |     |             |             |
|    |      | In order sequence. D O II D A E I C K F J<br>Draw the corresponding binary tree                                       |          |     |             |             |
|    |      | Draw the corresponding undry the                                                                                      |          |     |             |             |

## UNIT-V

9. Distinguish between B Tree and B+ tree. Create a B tree of order 14 Marks L 3 CO5 PO2 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.

(OR)

10 a) Implement Breadth First Search algorithm for the following 10 Marks L3 CO5 PO2 . graph.



4 Marks L 1 CO6 PO2

 (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

#### 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<sup>2</sup>. 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.
- 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  $\frac{\pi p d^4}{8tE} (1 v)$ .
- 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<sup>2</sup>. Find the final stresses set up across the section when the compound cylinder is subjected to an internal fluid pressure of 60 N/mm<sup>2</sup>.

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SVEC-10

Max. Marks: 70

CODE No.:14BT3BS02

SVEC-14

Roll No.

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

II B.Tech I Semester (SVEC14) Supplementary Examinations August - 2021

#### SPECIAL FUNCTIONS AND COMPLEX ANALYSIS

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

Time: 3 hours

2

Max. Marks: 70

#### **Answer One Question from each Unit** All questions carry equal marks

## UNIT-I

- Define beta and gamma functions and establish a relationship between them. 7 Marks 1 a)
  - b) State Bessels differential equation and its solution  $J_n(x)$ . Show that 7 Marks  $J_{1/2}(x) = \sqrt{\frac{2}{\pi x}} \sin x$ .

#### (**OR**)

a) Show that 
$$2^{2n-1} \Gamma(n)(n+\frac{1}{2}) = \Gamma(2n)\sqrt{\pi}$$
. 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

- Find the an analytic function f(z) = u + iv, given that  $u v = (x y)(x^2 + 4xy + y^2)$ . b) 7 Marks (**OR**)
- 4 Show that the function  $f(z) = \sqrt{|xy|}$  is not analytic at the origin, although C-R 7 Marks a) equations are satisfied at that point.
  - b) Find the analytic function f(z) = u + iv if  $u = a(1 + Cos\theta)$ .

## UNIT-III)

7 Marks

5 a) Evaluate 
$$\int_{0}^{2+i} z^2 dz$$
 along the imaginary axis to i and then horizontally to 2 + i.  
5 b)  $z^3 + z^2 + 2z - 1$  7 Marks

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 7 Marks  

$$f(z) = z^2 + 3z - 2i$$
 inside the circle  $|z| = 1$ .

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 Determine the poles and corresponding residues for the function f(z)= a) 7 Marks  $\frac{z^2}{(z-1)(z-2)^2}.$ By the method of residues, evaluate  $\int_{0}^{2\pi} \frac{d\theta}{1 - 2a\sin\theta + a^2} = 0 < a < 1.$ 7 Marks b) Calculate the value of  $\oint_c \frac{z-3}{z^2+2z+5}$  dz where C is the circle |z+1+i 1=2. 8 7 Marks a) b) 7 Marks Evaluate  $\int_{0}^{\infty} \frac{dx}{(x^2+1)^2}$ . UNIT-V 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 9 a) Find the Bilinear Transformation which maps the points z = 1-i-1 in to the points 7 Marks b) w = i, 0, -i.(**OR**) **10** a) Show that the Bilinear Transformation maps circles to circles. 7 Marks Discuss about the transformation w = Cosz. 7 Marks b) \$P \$P \$P

Roll No.

SVEC-14

Max. Marks: 70

#### 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

**Answer One Ouestion from each Unit** All questions carry equal marks

UNIT-I

- In a certain college 25% of boys and 10% of girls are studying mathematics. The 1 7 Marks a) the student body. (i) What is the probability that girls contribute 60% of 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.
  - X is a continuous random variable with probability density function given by **b**) 7 Marks  $kx, 0 \le x \le 2$ 
    - $2x, 2 \le x \le 4$  $f(x) = \langle$  $k(6-x), 4 \le x \le 6$

Determine: i) *k*.

#### iii) variance. (**OR**)

2 Define the following and illustrate with example. 6 Marks a) i) Probability. ii) Mutually exclusive events. iii) Conditional event. A random variable X has the following probability function: b) 8 Marks

| Х       | 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 |  |
| Determi | ne: i) k | ii) P( | X < 4) | iii) | P(X > 1) | ) (iv) | P(2 < X < | < 7)  |       |  |
|         |          |        |        |      |          |        |           |       |       |  |

ii) mean.

#### UNIT-II )

- Derive mean and variance of Binomial Distribution. 3 a)
  - 7 Marks Samples of (n=6) items are drawn at random from the production process which is 7 Marks b) making 10% defectives, calculate the probabilities of 0,1,2,3,4,5 and 6 defectives in a sample.
    - (**OR**)
- Derive the mean and variance of normal distribution. 4 a) If x is a Poisson variable such that p(x = 1) = 24 p(x = 3), find the probability b) p(x=0).

## UNIT-III)

Altoona Tire Company sells its ATC-50 tires with a 50,000-mile tread-life warranty. Loorie 7 Marks 5 a) 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:

| 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.

Calculate coefficient of correlation from the following data. **b**)

| x | 12 | 9 | 8 | 10 | 11 | 13 | 7 |
|---|----|---|---|----|----|----|---|
| у | 14 | 8 | 6 | 9  | 11 | 12 | 3 |
| 2 |    |   |   |    |    |    | _ |

1

7 Marks

7 Marks

7 Marks

#### (**OR**)

- 6 a) The numbers of defective washers in a workshop of 20 samples containing 7 Marks 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.
  - Calculate Karl Pearson's correlation coefficient for the following paired data 7 Marks b) 28 41 40 38 35 33 40 32 36 33 х 23 33 34 30 28 31 36 38 v 34 26

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 8 Marks two which can be taken without replacement from this population. Estimate:
  - 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. 6 Marks Construct 95%. Confidence interval for the mean.

#### (OR)

- 8 a) When a sample is taken from an infinite population discuss about the standard error 7 Marks of the mean if the sample size is decreased from 800 to 200.
  - b) A sample of 100 electric bulbs produced by a manufacturer A showed a mean life 7 Marks 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.

## UNIT-V

- 9 a) A random sample of 10 boys had the following IQS 70, 120, 110, 101, 88, 83, 95, 7 Marks 98, 107, 100 Does this data support the assumption of population IQ of 100 (Tabulated value2.262 at 5% L.O.S)
  - b) Two independent random sample each of 8 individuals provide the following data. 7 Marks Estimate the variance ration and test the significance.

| 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 7 Marks particular track with the following results.

| Horse(A) | 28 | 30 | 32 | 33 | 33 | 29 | 34 |
|----------|----|----|----|----|----|----|----|
| Horse(B) | 29 | 30 | 30 | 24 | 27 | 29 | 1  |

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% 7 Marks leave of significance.

| X | 0   | 1   | 2   | 3        | 4  | 5 | 6 | 7 |
|---|-----|-----|-----|----------|----|---|---|---|
| F | 305 | 366 | 210 | 80       | 28 | 9 | 2 | 1 |
|   |     | Ŕ   | (j) | <u> </u> |    |   |   |   |

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur) II B.Tech I Semester (SVEC14) Supplementary Examinations August - 2021 MECHANICS OF SOLIDS

[ Civil Engineering ]

Time: 3 hours

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 7 Marks bar if  $E = 2x10^5$  MPa.



b) A bar of 20 mm diameter is tested in tension. It is observed that when a load of 7 Marks 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.

#### (OR)

2 A round copper rod, 560mm long, has a diameter of 30mm over a length of 14 Marks 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<sup>2</sup>.

## UNIT-II

3 Define the SF and BM at a section of a beam. Explain the utility of drawing SF 14 Marks and BM diagrams for a beam. Also obtain relationship between SF and BM.

(OR)

A simply supported beam of span 6 m carries a clockwise couple of 5 kN-m at 14 Marks 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.

## UNIT-III

5 Three steel, plates of width 300mm and thickness 10mm are welded together to 14 Marks 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?

#### (OR)

6 Sketch the variation of shear stress across the depth of an I section of depth 14 Marks 300mm, web thickness 10mm and flange size of 100mm x 10mm. The Flexural shear force action on the section is 200kN.

## UNIT-IV

7 Derive Torsion equation and determine the power transmitted by a solid shaft 14 Marks 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.

#### (OR)

Max. Marks: 70

SVEC-14

- 8 A closely coiled helical spring of round steel wire 10 mm in diameter having 14 Marks complete turns with a mean diameter of 12 cm is subjected to an axial load of 200N. Determine:
  - 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 14 Marks is carrying a fluid at a pressure of 1.6 N/mm<sup>2</sup>. Find the change in dimensions of the cylinder.

#### (**O**R)

10 Derive lame's equations for the analysis of thick cylinders. Also sketch the 14 Marks 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.

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Time: 3 hours

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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 ]

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. 14 Marks Give their dimensions. Calculate the density, specific weight and weight of one litre of petrol of specific gravity 0.7.

#### (OR)

2 Differentiate between: (i) Absolute and gauge pressure (ii) Simple manometer 14 Marks 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.

## UNIT-II

**3** Derive continuity equation for one dimensional flow and list out uses and 14 Marks limitations of flow net.

#### (OR)

- **4** a) Define path line, streak line and the streamline. For what type of flow these lines 7 Marks are identical?
  - b) Define the Equation of Continuity. Derive the Continuity Equation for three 7 Marks dimensional flows from fundamentals by indicating the assumptions made where ever are required.

## UNIT-III

5 Derive Darcy - Weisbach equation and a pipe line AB of diameter 300mm and 14 Marks 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<sup>2</sup>. Take f = 0.008.

#### (OR)

6 A weir 36m long is divided in to 12 equal bays by vertical posts, each 60cm 14 Marks wide. Determine the discharge over the weir if the head over the crest is 1.20m and velocity of approach is 2metres per second.

## UNIT-IV

7 Describe the Reynolds's experiment with a neat sketch. Explain how would you 14 Marks distinguish between hydro dynamically smooth and rough boundaries.

#### (OR)

8 A laminar flow is taking place in a pipe of diameter 200mm. The maximum 14 Marks 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.

## UNIT-V

- 9 Explain the procedure for solving problem by Buckingham's  $\pi$  theorem in briefly. 14 Marks **(OR)**
- 10Explain the following .14 Marksi) 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

## Answer One Question from each Unit

Max. Marks: 70

SVEC-14

#### 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.<br>(OR)                                                                                             | 7 Marks |
| 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 $\mu$ C and -2 $\mu$ C 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                                                                                     | 7 Marks |
|    |               | filament of 25 A in the $\mathbf{a}_z$ direction and extending from $Z = 0$ to $Z = 6$ .                                                                        |         |
|    |               | (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 |
| 9  | a)            | Explain the difference between induced transformer and motional <b>emf</b>                                                                                      | 7 Marke |
| )  | $\frac{a}{b}$ | Write the point form of Maxwell's equations Explain their significance                                                                                          | 7 Marks |
|    | 0)            | (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. $\circledast \ \circledast \ \circledast$                                           | 7 Marks |
Max. Marks: 70

#### **SREE VIDYANIKETHAN ENGINEERING COLLEGE**

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

Roll No.

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

## **ELECTRIC CIRCUITS**

[Electrical and Electronics Engineering]

Time: 3 hours

Answer One Question from each Unit All questions carry equal marks





b) Determine the voltage drop across  $5\Omega$  resistor in fig. 2 using nodal analysis. 7 Marks 4  $\Omega$ 



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



- b) List the steps involved in constructing the dual of a network. 7 Marks
- **3** a) Analyze the behavior of a series RC circuit excited by a sinusoidal voltage 7 Marks source.
  - b) A series circuit consumes 2kW at 0.8 power factor lag when connected to 230 V, 7 Marks 50Hz supply. Calculate current, kVA, kVAR.

- 4 a) Derive the resonant frequency of parallel combination of series RC and RL 8 Marks circuits.
  - 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 7 Marks star connection.
  - b) Three identical impedances of  $(3+j4)\Omega$  are connected in delta. Find an equivalent 7 Marks star network such that the line current is the same when connected to the same supply.

#### (OR)

6 Explain the measurement of three phase power using two wattmeter methods 14 Marks with neat phasor diagram.

## UNIT-IV

- 7 a) State and explain Faraday's law of Electromagnetic Induction.
  - b) Two coils A and B are wound on same ferromagnetic core. There are 300 turns 8 Marks 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.

#### (OR)

- 8 a) A steel ring of 25cm mean diameter and of circular section of 3cm in diameter 10 Marks has an air gap of 1.5mm length. It is wound uniformly with 700 turns of wire carrying a current of 2A. Calculate.
  - 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

6 Marks

## UNIT-V

- 9 a) State and explain maximum power transfer theorem with a suitable example. 7 Marks
  - b) Obtain the current in  $2\Omega$  resistor in the circuit of Fig.4 by using the venin's 7 Marks theorem.



**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  $5\Omega$  branch is increased to  $6\Omega$ , 7 Marks Determine the compensation source and verify the results.



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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

Roll No.

#### **Answer One Question from each Unit** All questions carry equal marks

## UNIT-I

1 Explain about series and parallel inductive and capacitive circuit. 8 Marks a) The filament of a light in the circuit has a certain amount of resistance. The bulb 6 Marks b) operates with 120V and 0.8A of current, what is the resistance of its filament?

(**OR**)

- State Kirchoffs voltage and current law with suitable examples. 2 a) 4 Marks
  - Explain voltage division rule and current division rule with an example. 5 Marks b)
  - Find the current through branch a-b using mesh analysis shown Figure.1. 5 Marks c)



## UNIT-II

3 Define resonance and explain the characteristics of series resonance. 7 Marks a) Design a series R-L-C circuit that resonates at 1.5kHz and consumes 50W 7 Marks **b**) from a 50V A.C source operating at the resonance frequency. The bandwidth is 0.75 kHz.

#### (**OR**)

- Distinguish between series and parallel Resonance circuits. 4 6 Marks a)
  - b) A non-alternating periodic waveform has been shown in Figure 2. Find its form 8 Marks factor.



- 5 Obtain the Transient response of RC series circuit for sinusoidal excitation. 7 Marks a)
  - A series RC circuit has R=20 $\Omega$  and C=100 $\mu$ F. A voltage v = 200 Sin 314t is 7 Marks b) applied at t=2.14 msec. Obtain an expression for current. Find the value of current after time 1 m sec from the switching instant.

#### (**OR**)

Explain and derive the expressions of Transient response of RLC series circuit 6 14 Marks with sinusoidal excitation.

## UNIT-IV

- 7 Define port network and obtain the equations of an impedance parameters of 7 Marks a) two port network.
  - Derive the Z-parameter equations for lattice network. b)

8 Find the Z and Y-parameters of the circuit shown in Figure.3 and check the 14 Marks condition for symmetry and reciprocity.



- 9 a) State and explain maximum power transfer theorem and derive the condition for 7 Marks maximum power transfer in an AC circuits.
  - b) Using Norton's theorem, find current through  $6\Omega$  resistor shown in Figure.4. 7 Marks





- 10 a)State reciprocity theorem and explain with an example.6 Marks
  - b) Find the voltage across the 20  $\Omega$  resistor by using superposition theorem for the 8 Marks circuit shown in Figure.5



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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 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                                                                                                                                                                                                 | 5 Marks |
|   | ,  | drawn from a deck of a regular 52 cards.                                                                                                                                                                                                                                         |         |
|   |    | 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 |
| - | `` |                                                                                                                                                                                                                                                                                  |         |
| 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. <b>(OR)</b>                                                                                                                                                                                    | 8 Marks |
| 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 7 Marks temperature.
  - b) An amplifier with gain = 30 dB and BN = 25 kHz is found to have T0 = 120 K. 7 Marks Find Te and Noise figure.

#### (OR)

- 10 a) Derive the equation for Noise figure of Cascaded system in terms of individual 7 Marks Noise Figures.
  - b) State and prove any three properties of Narrow band Noise processes. 7 Marks

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(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

#### 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 7 Marks them.
  - b) Draw the circuit of a full wave rectifier circuit with L section filter and derive 7 Marks the expression for ripple factor.

#### (OR)

- **2** a) Explain the formation of depletion region in an open circuited PN-junction. 7 Marks What is the significance of barrier potential across a PN-junction?
  - b) A HWR circuit is supplied from a 230-V, 50Hz supply with a step-down ratio of 7 Marks 3:1 to a resistive load of 10 k $\Omega$ . The diode forward resistance is 10 $\Omega$ . Calculate maximum, average, RMS values of current, DC output voltage, efficiency of rectification and ripple factor.

## UNIT-II

| 2          | a)       | Skatch the input and output abaratoristics of a transistor in CD configuration          | 7 Mortra   |
|------------|----------|-----------------------------------------------------------------------------------------|------------|
| 3          | a)       | Sketch the input and output characteristics of a transistor in CB configuration.        | 7 Warks    |
|            | b)       | Explain how a transistor works as an amplifier.                                         | / 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         | 7 Marks    |
|            |          | and derive at an expression for its stability factor.                                   |            |
|            |          |                                                                                         |            |
| _          |          |                                                                                         |            |
| 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         | 7 Marks    |
|            | - )      | circuit List the characteristics of a CB amplifier                                      |            |
|            |          | (OR)                                                                                    |            |
| 6          | a)       | Analyze the CC amplifier using approximate hybrid model                                 | 8 Marks    |
| U          | u)<br>b) | Describe the simplified hybrid model                                                    | 6 Marks    |
|            | 0)       |                                                                                         | 0 WIAIKS   |
|            |          |                                                                                         |            |
| 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                | 8 Marks    |
| U          | ч)       | amplifier                                                                               | 0 10141110 |
|            | h)       | Write the comparisons of BIT and IFFT                                                   | 6 Marks    |
|            | 0)       |                                                                                         | 0 WIGINS   |
|            |          |                                                                                         |            |
| 9          | a)       | Explain the principle and operation of tunnel diode.                                    | 6 Marks    |
|            | b)       | Explain the construction, operation, equivalent circuit V-I characteristics and         | 8 Marks    |
|            | ,        | application of UJT.                                                                     |            |
|            |          | (OR)                                                                                    |            |
| 10         | a)       | With neat diagram explain about varactor diode                                          | 6 Marks    |
| <b>T V</b> | u /      |                                                                                         | V IVIAIND  |

b) Explain the construction, operation, V-I characteristics and application of SCR. 8 Marks

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Max. Marks: 70

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

## FOUNDATIONS OF ELECTRICAL ENGINEERING

## [ Computer Science and Systems Engineering ]

| Time | : 3 ha   | Ma                                                                                                                                                                                          | ax. Marks: 70        |
|------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
|      |          | Answer One Question from each Unit                                                                                                                                                          |                      |
|      |          | All questions carry equal marks                                                                                                                                                             |                      |
|      |          | UNIT-I                                                                                                                                                                                      |                      |
| 1    | a)<br>b) | Explain about various types of sources used in electrical circuit analysis.<br>Explain when the mesh analysis and super mesh analysis are used.                                             | 7 Marks<br>7 Marks   |
| 2    |          | State and prove Kirchhoff's laws.                                                                                                                                                           | 14 Marks             |
|      |          | UNIT-II)                                                                                                                                                                                    |                      |
| 3    | a)<br>b) | Define the terms Admittance, Impedance, Conductance and Suceptance.<br>Show that in an AC circuit, current through purely capacitive circuit leads the applied voltage by 90 <sup>o</sup> . | 6 Marks<br>8 Marks   |
| 4    | a)<br>b) | (OR)<br>Define the terms complex power, real power and reactive power.<br>Differentiate between form factor, peak factor and power factor.                                                  | 7 Marks<br>7 Marks   |
|      |          | (UNIT-III)                                                                                                                                                                                  |                      |
| 5    | a)<br>b) | Mention the applications of various types of DC generator.<br>Derive the expression for emf equation of a DC generator.                                                                     | 7 Marks<br>7 Marks   |
| 6    | a)<br>b) | Derive torque equation of a DC motor from fundamentals.<br>Classify different types of DC generators with neat circuit diagram.                                                             | 7 Marks<br>7 Marks   |
|      |          | (UNIT-IV)                                                                                                                                                                                   |                      |
| 7    | a)<br>b) | Explain the working principle of AC servomotor.<br>Explain the working principle of stepper motor.                                                                                          | 7 Marks<br>7 Marks   |
| 8    | a)<br>b) | (OR)<br>Explain AC servomotors in detail.<br>List out various types of losses occurred in electrical machines and explain.                                                                  | 8 Marks<br>6 Marks   |
|      |          | UNIT-V                                                                                                                                                                                      |                      |
| 9    | a)<br>b) | Discuss about open loop systems with illustrations.<br>Discuss various time variant and time invariant systems with illustrations.                                                          | 7 Marks<br>7 Marks   |
| 10   | a)<br>b) | Write relations between force-voltage and force-current analogy.<br>Define signal flow graph and derive the transfer function using Mason's gain formula.                                   | 7 Marks<br>1 7 Marks |

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(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 ]

| Tim | e: 3 ho | Durs                                                                        | Max. Marks: 70 |
|-----|---------|-----------------------------------------------------------------------------|----------------|
|     |         | Answer One Question from each Unit<br>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        |
|     |         |                                                                             |                |
|     |         |                                                                             |                |
|     |         |                                                                             |                |
|     |         | (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        |
|     |         |                                                                             |                |
|     |         | $\begin{vmatrix} 2 & 1 & -2 \end{vmatrix}$                                  |                |
|     |         |                                                                             |                |

#### UNIT-II

- 3 Using Newton-Raphson method find the root of the equation  $x + log_{10}x = 3.375$ , 7 Marks a) correct to three decimal places.
  - From the following table of half-yearly premium for policies maturing at different 7 Marks **b**) ages, estimate the premium for policies maturing at age of 46.

| Age                 | 45     | 50    | 55    | 60    | 65    |
|---------------------|--------|-------|-------|-------|-------|
| Premium (in rupees) | 114.84 | 96.16 | 87.32 | 74.48 | 68.48 |
|                     | (      | OR)   |       |       |       |

- By using bisection method, find an approximate root of the equation  $\sin x = 1/x$ , 7 Marks 4 a) that lie between x=1 and x=1.5 (measured in radians), carry out computations up to 5 stages.
  - A curve passes through the points (1, -3), (3, 9), (4, 30) and (6, 132). Find the slope 7 Marks b) of the curve at x=2.

#### UNIT-III)

Estimate the value of  $\frac{dy}{dx}$  and  $\frac{d^2y}{dx^2}$  at x = 4.0 at x = 4.0 from the following 7 Marks a)

data.

5

| Х | 1.5   | 2.0 | 2.5    | 3.0  | 3.5    | 4.0  |
|---|-------|-----|--------|------|--------|------|
| у | 3.375 | 7.0 | 13.625 | 24.0 | 38.875 | 59.0 |
| - |       | .1  |        | . 1  |        |      |

Applying Rungekutta method, estimate y when x = 1.2 in steps of 0.1 given that b) 7 Marks  $\frac{dy}{dx} = x^2 + y^2, y(1) = 1.5$ .

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 |       |
| D   | TZ 11  | 4 1 0 1 | 1 C    |        | (0, 5) | .1     | · . · |

b) Using Runge-Kutta method of order four, compute y (2.5) for the equation 7 Marks  $\frac{dy}{dx} = \frac{x+y}{x}, y(2) = 2.$ 

## UNIT-IV

- 7 a) Obtain the half range sine series for the function  $f(x) = \frac{\pi x}{8}(\pi x)$  in the range 7 Marks  $0 \le x \le \pi$ .
  - b) Find the Fourier cosine Transform of  $e^{-\frac{x^z}{z}}$ . 7 Marks

#### (OR)

- 8 a) Find the half range cosine series for the function  $f(x) = \cos ax$  where  $\alpha$  is not an 7 Marks integer in the range  $0 < x < \pi$ 
  - 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 7 Marks xyz = f(x + y + z).

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 7 Marks

 $\frac{\partial u}{\partial x} = e^{2y}$ , when x=0, for all y.

#### (OR)

- 10 a) Form the partial differential equation by eliminating the arbitrary functions  $f_1$  and 4 Marks  $f_2$  from  $z = f_1(y+2x)+f_2(y-3x)$ .
  - b) Solve one dimensional heat equation by the method of separation of variables 10 Marks  $\frac{\partial u}{\partial t} = c^2 \frac{\partial^2 u}{\partial x^2}$

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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 ]

Electronics and first unrentation Engineering j

Time: 3 hours

#### 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 $\frac{d}{dx} [x^n J_n(x)] = x^n J_{n-1}(x)$ .              | 7 Marks |

#### (**OR**)

2 a) Evaluate 
$$\int_{0}^{1} x^{3} \sqrt{1 - x dx}$$
 using beta and gamma functions.  
b) show that  $\frac{d}{dx} [J_{0}(x)] = -J_{1}(x)$ 
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 $\mathbf{f}(\mathbf{z}) = \mathbf{u} + \mathbf{i}\mathbf{v}$ is an analytic function, find $\mathbf{f}(\mathbf{z})$ if $\mathbf{u} + \mathbf{v} = \frac{x}{x^2 + y^2}$ when $\mathbf{f}(1) = 1$ . | 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            | 7 Marks |
|---|----|-------------------------------------------------------------------------------------------------------------|---------|
|   |    | along a line parallel to imaginary axis from $z = 1$ to $z = 1 + i$ .                                       |         |
|   | b) | Use Cauchy's and integral formula to evaluate $\oint_c \frac{e^{2z}}{(z+1)^4} dz$ where c is the circle     | 7 Marks |
|   |    | $ \mathbf{z}  = 2.$                                                                                         |         |
|   |    | (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  \ge 2$ (ii) $ Z  \le 1$ (iii) $0 \le  Z-1  \le 1$ 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

Max. Marks: 70

b) Evaluate 
$$\int_{-\infty}^{\infty} \frac{x^2}{(x^2+1)(x^2+4)} dx$$
 using residue theorem. 7 Marks

(OR)

Determine the poles and corresponding residues for the function 7 Marks 8 a)  $f(z) = \frac{z^2 - 2z}{(z+1)^2 (z^2+1)}$ 

b)

By the method of residues, evaluate 
$$\int_{0}^{\pi} \frac{d\theta}{a+b\cos\theta} (a > b > 0)$$
. 7 Marks

9 a) Under the transformation 
$$w = 1/z$$
, find the image of the circle  $|z - 2i| = 2$ . 7 Marks

Define a Bilinear transformation and evaluate a bilinear transformation which b) 7 Marks maps the points 1, i, -1 onto the points i , 0 , -i .

- Show that the bilinear transformation maps circles to circles. 7 Marks **10** a) 7 Marks
  - Discuss about the transformation w = Cos z. b)

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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

- Define random variable, discrete random variable, continuous random variable 1 7 Marks a) and conditional probabilities.
  - If x and y are continues random variable, then prove that E(X + Y) = E(X) + E(Y). 7 Marks b)

#### (**OR**)

- State and prove the Baye's theorem. 2 a)
  - In a class 2% of Boys and 3% of girls are having blue eyes. There are 30% girls 7 Marks b) in the class. If a student is selected and found that having blue eyes, what is the probability that the student is a girl.

## UNIT-II)

Derive the mean and variance of normal distribution. 7 Marks 3 a) If x is a Poisson variable such that p(x = 1) = 24 p(x = 3), find the probability 7 Marks b) p(x=0).

#### (**OR**)

- 4 Derive mean and variance of Binomial Distribution. a)
  - Samples of (n=6) items are drawn at random from the production process which 7 Marks b) is making 10% defectives. Calculate the probabilities of 0,1,2,3,4,5 and 6 defectives in a sample.

## UNIT-III

| 5 | a) | Obtain the rank  | cor   | relat  | ion c  | o- ef | ficie | nt fo | r the | follo | wing  | data |    | 7 Marks |
|---|----|------------------|-------|--------|--------|-------|-------|-------|-------|-------|-------|------|----|---------|
|   |    |                  | Χ     | 68     | 64     | 75    | 50    | 64    | 80    | 75    | 40    | 55   | 64 |         |
|   |    |                  | Y     | 62     | 58     | 68    | 45    | 81    | 60    | 68    | 48    | 50   | 70 |         |
|   | b) | Derive angle be  | etwe  | en tv  | vo R   | egres | ssion | lines | 5.    |       |       |      |    | 7 Marks |
|   |    |                  |       |        |        |       |       | (0    | R)    |       |       |      |    |         |
| 6 | a) | Derive any three | e pr  | oper   | ties c | of Re | gress | sion  | lines |       |       |      |    | 7 Marks |
|   | b) | Find the correla | ation | n co-e | effici | ent b | oetwe | een x | and   | y vai | iable | s.   |    | 7 Marks |
|   |    |                  |       |        | Χ      | 9     | 11    | 14    | 15    | 17    | 19    |      |    |         |
|   |    |                  |       |        | Y      | 7     | 5     | 8     | 9     | 11    | 12    |      |    |         |
|   |    |                  |       |        |        |       |       |       |       |       |       |      |    |         |

## UNIT-IV

- 7 a) Explain Type-I, Type-II errors
  - In 64 randomly selected hours of production, the mean and the standard b) 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

7 Marks

#### (**OR**)

#### 1

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7 Marks

7 Marks

- **8** a) Define the Hypothesis, null Hypothesis, alternative Hypothesis Level of 7 Marks significance with suitable example
  - b) In a city 400 out of 600 were smokers. Does this information support the 7 Marks conclusion that the majority of men in this city are smokers? (z = 8.3 majority of people are smokers).

## 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.
  - b) The number of automobile accidents per week in a certain community are as 7 Marks 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.

#### (**OR**)

**10** a) The following tables give the number of aircraft accident that occurred during 7 Marks seven days of the week. Find whether the accidents are uniformly distributed over the week.

| No.of accidents 14 18 12 | 2 11 | 15 | 14 |
|--------------------------|------|----|----|

b) Explain briefly significance between F-Test and T-Test

7 Marks

49 49 49

Time: 3 hours

## SREE VIDYANIKETHAN ENGINEERING COLLEGE

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

#### **MECHANICS OF SOLIDS**

[Civil Engineering]

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  $f^2/2E$ ? 14 Marks What is Generalized Hooke's law? Write the governing equations.

#### (OR)

2 Derive relationship between E, N and K and also differentiate Resilience and 14 Marks Toughness.

## UNIT-II)

3 Define the SF and BM at a section of a beam. Explain the utility of drawing SF 14 Marks and BM diagrams for a beam. Also obtain relationship between SF and BM.

#### (**OR**)

4 A simply supported beam of span 6m carries a clockwise couple of 5kN-m at 14 Marks 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.

## UNIT-III)

5 Three steel plates of width 300mm and thickness 10mm are welded together to 14 Marks 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?

#### (OR)

6 Sketch the variation of shear stress across the depth of I section of depth 14 Marks 300mm, web thickness 10mm and flange size of 100mm x 10mm. The Flexural shear force action on the section is 200kN.

## UNIT-IV

7 Derive Torsion equation and determine the power transmitted by a solid shaft of 14 Marks 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.

#### (**OR**)

8 It is required to design a closed coiled helical spring which shall deflect 1 mm 14 Marks 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 x 10<sup>5</sup>Mpa. The mean diameter of the coil is 10 times that of the coil wire. Find the diameter and length of the wire.

## UNIT-V

9 A thick cylinder of steel having an internal diameter of 10cm and an external 14 Marks 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.

#### (OR)

10 Determine the maximum stress induced in a cylindrical steel strut of length 14 Marks 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  $E = 2.08 \times 10^5 \text{ N/mm}^2$ .

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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

## 

1 Explain the terms i) Dynamic viscosity, ii) Kinematic viscosity. Give their 14 Marks dimensions. Calculate the density, specific weight and weight of one litre of petrol of specific gravity 0.7.

#### (OR)

- 2 State and prove the Pascal's law. Determine the total pressure on a circular plate 14 Marks 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.
  - UNIT-II)
- 3 If for a two-dimensional potential flow, the velocity potential is given by: 14 Marks  $\Phi = 4x$  (3y-4), determine the velocity at the point(2, 3). Also determine the value of stream function  $\Psi$  at the point (2, 3).

#### (OR)

4 A pipe 250m long has a slope of 1in 100 and tapers from 1.5m diameter at the 14 Marks 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.

## UNIT-III)

5 List the various minor losses in pipes and derive an expression for the loss of 14 Marks 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  $C_d = 0.98$ .

#### (OR)

6 Define an orifice and a mouthpiece. What is the difference between the two? 14 Marks 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.

## UNIT-IV

7 a) Determine i) the pressure gradient, ii) the shear stress at the two horizontal 7 Marks 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  $\mu = 2.4525 \text{ N s/m}^2$ .

1

b) Describe Reynold's experiment to demonstrate the two types of flow.

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#### (OR)

- 8 a) Prove that the velocity distribution of viscous flow between two parallel plates 7 Marks 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.
  - b) Water is flowing between two large parallel plates which are 2m a part. 7 Marks 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.

## UNIT-V

9 Discharge Q through a turbine is a function of the turbine speed n, head H, 14 Marks diameter D of the runner, density  $\rho$  and viscosity  $\mu$  of the fluid and acceleration due to gravity **g**. Find an expression for Q.

#### (OR)

10 Explain Froude model law and A 1:64 model is constructed of an open channel 14 Marks in concrete which has Manning's N = 0.014. Find the value of N for the model.



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

## **ELECTROMAGNETIC FIELDS**

#### [Electrical and Electronics Engineering]

Time: 3 hours

1

2

3

4

5

6

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

## UNIT-I

State and explain Gauss's Law. 7 Marks a) Derive Maxwell's first equation as applied to the electrostatics using Gauss's 7 Marks b) Law (**OR**) Define electric field intensity and electric flux density. Deduce the relation 6 Marks a) between them. It is required to hold four equal point charges each in equilibrium at the corners of 8 Marks b) a square. Find the point charge which will do this if placed at the centroid of the square. UNIT-II ) Derive the expression for EFI due to an Electric dipole. 7 Marks a) Two point charges of  $2\mu$ C and  $-2\mu$ C are located at (0,0,1) and (0,0,-1) respectively 7 Marks b) in free space. Find the potential at (0,3,4) m. (**OR**) Derive the expression for Potential due to an Electric dipole. 7 Marks a) Derive the expression for capacitance of a parallel plate capacitor without 7 Marks b) composite Dielectric material. UNIT-III) State and explain Ampere's circuital law in integral and differential forms. 7 Marks a) Explain the concept of magnetic dipole and dipole moment. 7 Marks b) (**OR**) Write Maxwell's Fourth equation in Integral form and explain. 7 Marks a) Obtain the expression for Magnetic Field Intensity due to infinitely long co-axial b) 7 Marks transmission line by applying Ampere's circuital Law. 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 | 7 Marks |
|    |    | Maxwell's equation in vector differential form for time varying fields.             |         |
|    |    | (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 |
|    |    |                                                                                     |         |

## Max. Marks: 70

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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   |
| $\mathbf{r}$ | a)       | (UK)<br>With a next skotch, availain the operation of a three point starter                                                                                                                   | 7 Marka   |
| 2            | a)<br>b) | Explain different types of losses in DC machines                                                                                                                                              | 7 Marks   |
|              | 0)       | 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 <sup>2</sup> and                                                                                                  | 6 Marks   |
|              |          | a maximum density of 8 wb/m <sup>2</sup> . Calculate the number of turns of primary and secondary windings.                                                                                   |           |
|              |          | (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   |
| 0            | a)       | "Single phase Induction motor is not self starting" Why?                                                                                                                                      | 7 Mortes  |
| 9            | a)<br>b) | Explain the principle of operation of split phase induction motor                                                                                                                             | 7 Marks   |
|              | 0)       | (OR)                                                                                                                                                                                          | / 1010115 |
| 10           |          | Explain the construction and the principle of operation of stepper motor. Also give the applications of this motor.                                                                           | 14 Marks  |
|              |          |                                                                                                                                                                                               |           |

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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

## Answer One Question from each Unit

## All questions carry equal marks

## UNIT-I

- 1 a) State and explain Kirchhoff's law with suitable examples.
  - b) Find the voltage across  $2\Omega$  resistor in Fig.1b.





**2** a) Briefly explain about source transformation techniques.

b) Find the voltage across  $10\Omega$  resistor in Fig.2b as shown below.



## UNIT-II

- **3** a) Define resonance and list out its implications.
  - b) What is locus diagram? Draw and explain current locus diagram for a series RL 8 Marks circuit, with fixed resistance by deriving necessary expressions.

#### (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 7 Marks excitation.
  - b) Determine the voltage at the terminals of a coil having  $R = 10\Omega$  and L = 15mH 7 Marks at the instant when the current is 10A and increasing at the rate of 5A/sec. Also find the stored energy in the inductor.

#### (**OR**)

6 Derive the expressions of Transient response of RC series circuit with sinusoidal 14 Marks excitation using Laplace transform approach.

Max. Marks: 70

6 Marks 8 Marks

7 Marks 7 Marks

- 6 Marks

## UNIT-IV

- 7 a) Derive the relations of Y-parameters in terms of Z-parameters.7 Marksb) Explain about cascade connection of two port networks.7 Marks(OR)
- 8 Define image impedance. Derive the expressions of image impedances of the 14 Marks basic T-Network.



- 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 7 Marks find the maximum power delivered to the load in the circuit shown in Fig.9b.









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Time: 3 hours

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

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

#### **THERMODYNAMICS**

# [Mechanical Engineering]

Max. Marks: 70

#### **Answer One Question from each Unit** All questions carry equal marks

## UNIT-I

- How will you find out whether a given quantity is a thermodynamic property? 1 7 Marks a) How are these properties classified? Give examples of each type. Explain: i) reversible process. ii) irreversible process. Write important criterion for b) 7 Marks a process to be reversible. (**OR**) 2 a) Define following: 9 Marks i) Thermo dynamic state. ii) Quasistatic process. iii) Cyclic and non cyclic process.
  - Show that the work and heat are path functions. b)

## UNIT-II)

- What is a steady flow process? Write the steady flow energy equation and explain 7 Marks 3 a) the various terms in it.
  - Represent schematically heat engine, heat pump and refrigerator. Give their b) 7 Marks performance.

#### (**OR**)

- 4 State and prove Carnot's theorem. a)
  - A heat engine is used to drive a heat pump. The heat transfers from the heat engine b) 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.

## UNIT-III)

- 5 What is irreversibility? Show the gain of entropy in an irreversible process on 7 Marks a) T-s diagram in the case of steam turbine and compressor.
  - Define the term availability. Find an expression for the availability of a closed b) 7 Marks system.

#### (**OR**)

- 6 Define available and unavailable energy. a)
  - Air enters the heater at 27°C and leaves at 67°C, the pressure being constant at b) 10 Marks 4 bar. The heat source is at 260°C and the surroundings are at 15°C. 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.

## UNIT-IV)

- What are Maxwell relations? Derive them. 7 a)
  - 7 Marks Describe the Mollier chart for steam with the help of a suitable diagram. What is 7 Marks b) the importance of this diagram in thermodynamic calculations?

5 Marks

6 Marks

8 Marks

4 Marks

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#### (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 6 Marks coordinate. Also indicate different regions on the diagram.

## UNIT-V

- **9** a) Derive the expression from the air standard efficiency of the diesel cycle in terms 7 Marks of compression ratio, cut off ration and adiabatic index.
  - b) Explain the working principle of Otto cycle with the help of P-V and T-S 7 Marks diagrams.

#### (OR)

**10** Derive an expression for the thermal efficiency of diesel cycle and draw P-V and 14 Marks T-S diagrams.



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

#### **PROBABILITY AND STOCHASTIC PROCESSES**

[Electronics and Communication Engineering]

All questions carry equal marks

#### UNIT-I Define joint and conditional probabilities. 4 Marks a) When are two events said to be collectively exhaustive? Explain with examples 5 Marks b) Estimate the probability of the card being either red or a king when one card is c) 5 Marks drawn from a deck of a regular 52 cards (**OR**) State and prove multiplication theorem of probability. 6 Marks 2 a) b) For any two events A and B in a sample space S, if $B \subset A$ then prove that 8 Marks P(A/B) = 1. UNIT-II State and prove any four properties of probability density function. 6 Marks 3 a) When two dice are thrown, calculate the expected value of the sum of number of 8 Marks b) points on them. (**OR**) State four properties of conditional density function. 7 Marks 4 a) Find the MGF of a Binomial distribution and hence find mean and variance. 7 Marks b) (UNIT-III) Find the skew for Gaussian distributed random variable. 7 Marks 5 a) Define conditional distribution and density function of two random variables 7 Marks b) X and Y. (**OR**) Find the characteristic function for a random variable with density function 6 8 Marks a) $f_x(\omega) = x$ for $0 \le x \le 1$ . Define and explain the characteristic function. 6 Marks b) UNIT-IV Explain about random processes. 7 6 Marks a) State and prove mean Ergodic theorem. 8 Marks b) (**OR**) Discuss about Gaussian Random Process and Poisson Random Process. 7 Marks a) Discuss the auto correlation properties of a random process. 7 Marks b) UNIT-V Classify noise and explain thermal noise in detail for stochastic processes. 7 Marks a) b) Explain noise factor and noise figure. 7 Marks (**OR**) Define the term interference and list several sources. 7 Marks 10 a) For an amplifier with an output signal power of 10W and an output noise power 7 Marks b) of 0.01W, determine the signal-to-noise power ratio

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**Answer One Question from each Unit** 

Max. Marks: 70

## Time: 3 hours

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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 Explain the V-I characteristics of Diode of Diode under forward and reverse bias. 10 Marks a) An ac voltage of peak value 20.7V is connected in series with a silicon diode and 4 Marks b)
  - a load resistance of 490 $\Omega$ . The forward resistance of the diode is 10 $\Omega$ . 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?

#### (OR)

- Discuss about the temperature dependence of V-I characteristics of PN diode 2 a) 5 Marks
  - Distinguish between transition capacitance and diffusion capacitance of PN 4 Marks **b**) junction diode.
  - Compare and contrast half-wave and full-wave rectifiers. Mention any three 5 Marks c) applications of rectifier

## UNIT-II)

Sketch and explain the common base input and output characteristics. How do 10 Marks 3 a) you draw these curves experimentally? Describe the Base-Width modulation. b) 4 Marks (**OR**) Explain how you would locate the operating point using the load line. 7 Marks 4 a) Explain the collector to base bias arrangement and derive at an expression for its 7 Marks b) stability factor with necessary circuit diagram. (UNIT-III) How do you determine h-parameters from transistor 5 Define h-parameters. a) 7 Marks characteristics? Draw the circuit diagram of CB amplifier circuit and its h-parameter equivalent b) 7 Marks circuit. List the characteristics of a CB amplifier. (**OR**) Analyze the CC amplifier using approximate hybrid model. 8 Marks 6 a) Describe the simplified hybrid model. 6 Marks b) (UNIT-IV) Draw the circuit diagram of common source amplifier and derive expression for 7 a) 7 Marks gain of the amplifier. With neat structure, explain the principle of operation of depletion MOSFET. 7 Marks b) (**OR**) Explain the Drain and Transfer characteristics of a JFET. 7 Marks 8 a) With neat diagrams, explain the characteristics of MOSFET in enhancement 7 Marks b) mode. UNIT-V 9 Explain the working principle and characteristics of SCR. 7 Marks a) Draw the equivalent circuit of UJT and explain the characteristics. 7 Marks **b**) (**OR**) 10 a) Write the applications of UJT. 6 Marks Explain the operation of varactor diode. 8 Marks b) 쓩 융

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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              | 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 |
|    |    |                                                                                                |         |
| 3  | a) | Explain how transistor is used an amplifier                                                    | 7 Marks |
| •  | b) | Derive the relationship between $\alpha$ and $\beta$ .                                         | 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 |
| 6  | a) | Draw the circuit diagram of common source amplifier and formulate the                          | 7 Marks |
| Ũ  | )  | equation for gain of the amplifier.                                                            | ,       |
|    | 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? <b>(OR)</b>              | 6 Marks |
| 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)                                                                                           | 0.74    |
| 10 | a) | Explain the construction and working of Tunnel diode.                                          | 8 Marks |
|    | U) | what are the applications of variation diode?                                                  | o warks |
|    |    |                                                                                                |         |

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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

|   |                | An questions carry equal marks                                                                                                                                                       |                               |
|---|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
|   |                | UNIT-I                                                                                                                                                                               |                               |
| 1 | a)             | Convert the given Binary number 11011101 in:<br>i) BCD<br>ii) HEXADECIMAL<br>iii) DECIMAL                                                                                            | 7 Marks                       |
|   | b)             | What is a 2's complement? Explain it with an example.                                                                                                                                | 7 Marks                       |
| 2 | a)<br>b)       | What is canonical form? Explain different canonical forms with an example.<br>Draw the logic diagram for the given Boolean expression<br>$F = A\overline{B} + \overline{C}D + ABC$ . | 7 Marks<br>7 Marks            |
|   |                | UNIT-II                                                                                                                                                                              |                               |
| 3 | a)<br>b)       | What is Karnaugh map? Explain its concept with example<br>Simplify the Boolean Function $F(A, B, C, D) = \prod (0, 2, 5, 6, 7, 9, 11, 14)$ using karnaugh map.                       | 4 Marks<br>10 Marks           |
|   |                | (OR)                                                                                                                                                                                 |                               |
| 4 | a)<br>b)<br>c) | Explain don't-care condition.<br>Implement AND, OR, NOT gates using Universal gates<br>Describe EX-OR function with an example.                                                      | 4 Marks<br>6 Marks<br>4 Marks |
|   |                | UNIT-III)                                                                                                                                                                            |                               |
| 5 |                | Construct a 8 x 1 multiplexer for the Boolean function $F(A,B,C,D)=\Sigma(1,3,4,11,12,13,14,15)$ .                                                                                   | 14 Marks                      |
|   |                | (OR)                                                                                                                                                                                 |                               |
| 6 | a)<br>b)       | Design a priority 4-bit priority Encoder circuit<br>Write the truth table for a full adder. Explain the operation of a binary adder-<br>subtract or with a block diagram.            | 8 Marks<br>6 Marks            |
|   |                | UNIT-IV                                                                                                                                                                              |                               |
| 7 | a)<br>b)       | Compare combinational circuit with sequential circuit.<br>What is Flip-Flop? Explain about J-K, D-Flip-Flop.                                                                         | 7 Marks<br>7 Marks            |
| 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

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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** 

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**Answer One Ouestion from each Unit** All questions carry equal marks

## UNIT-I

- 1 Show the following equivalence  $P \rightarrow (Q \lor R) \Leftrightarrow (P \rightarrow Q) \lor (P \rightarrow R)$ 7 Marks a)
  - b) Express the product of sum canonical form of the formula 7 Marks  $(P \land Q) \lor (\neg P \lor Q \land R)$

#### (**OR**)

- Show that  $S \cup R$  is tautologically implied by  $(P \cup Q) \cap (P \rightarrow R) \cap (Q \rightarrow S)$ . 7 Marks a)
- Explain about free and bounded variables in detail in the context of predicate 7 Marks b) logic.

#### UNIT-II )

- Define partial and total order of relations. 3 a)
  - Design a Hasse diagram of  $\{1, 2, 3, 6, 12\}$  under the partial ordering relation **b**) 9 Marks 'divided'.

#### (**OR**)

- Show that f(x, y) = x y is a primitive recursive function. 4 7 Marks a)
  - Let  $X = \{1, 2, 3, 4, 5, 6, 7\}$  and  $R = \{(x,y)/x y \text{ is divisible by } 3\}$  in X. Design an 7 Marks **b**) Equivalence Relation.

## (UNIT-III)

- Define a semi group and a monoid. Give an example for a semi group but not 5 7 Marks a) monoid.
  - 7 Marks b) Prove that a Group in which every element has its own inverse, is abelian group.

(**OR**)

- (G,\*) is a group and (a,b)  $\in$  G then show that  $(a * b)^{-1} = b^{-1} * a^{-1}$ . 7 Marks a)
- Every finite group of order "n" is isomorphic to a permutation group of degree 7 Marks b) 'n' prove it.

## UNIT-IV

- In  $(1 + x^5 + x^9)^{10}$  find the coefficient of  $x^{23}$  and  $x^{32}$ . 7 a)
  - Compute the number of six letter combinations of the letter of English alphabet. 7 Marks b) If no letter is to appear in the combination more than 2 times.

(**OR**)

- 7 Marks 8 Solve the Recurrence Relation  $a_n - 9a_{n-1} - 26a_{n-2} - 24a_{n-3} = 0$  where  $a_0 = 0$ ,  $a_1 = 1$ a) and  $a_2 = 10$ .
  - How many ways can 5 day's be chosen from each of the 12 months of an 7 Marks b) ordinary year of 365 day's.

## UNIT-V

- 9 7 Marks Show that the complete graph  $k_s$  is non planar. a) b)
  - Explain BFS algorithm with example.

10 a) State and prove Grin berg's theorem. Show that the complete Bipartite graph of  $k_{3,3}$  is non planar. 7 Marks **b**)

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Max. Marks: 70

7 Marks

5 Marks

7 Marks

7 Marks

Roll No.

#### **SREE VIDYANIKETHAN ENGINEERING COLLEGE**

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#### 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

7 Marks

#### 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 CO2 7 Marks continuous variable *X*. By analyzing the functions, estimate the value of '*a*' and '*b*' such that

(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 ; CO4 7 Marks 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.

b) Probability density function of random variable *X* is CO1

 $f(x) = \begin{cases} \frac{1}{2}\sin x, \text{ for } 0 \le x \le \pi\\ 0, \text{ elsewhere} \end{cases}$ 

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 CO3 7 Marks following data

| Χ | 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. CO4 7 Marks Determine the probability that the numbers of accidents is

i) at least one. (ii) at most one.

#### (**OR**)

- 4 a) Calculate the probability that at most 5 defective components will be CO4 7 Marks 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.
  - b) The marks obtained in statistics in a certain examination found to be CO4 7 Marks 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.

SVEC-16

## UNIT-III)

5 The following are the figures of defectives in 22 lots each containing CO3 14 Marks 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.

(OR)

6 Calculate the correlation coefficient and regression lines for the following CO4 14 Marks data

| Χ | 2 | 4 | 6 | 8  | 10 | 12 | 14 |
|---|---|---|---|----|----|----|----|
| Y | 4 | 2 | 5 | 10 | 4  | 11 | 12 |
|   |   |   |   |    |    |    |    |

- 7 a) In a sample of 500 from a village in Andhra Pradesh, 280 are found to be CO2 7 Marks rice eaters and the rest are wheat eaters. Examine that both the articles are equally popular or not. Justify.
  - b) A random sample of size 32 from a normal population having the mean CO2 7 Marks 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.

#### (**OR**)

- 8 a) At a certain date in a large city 400 out of a random sample of 500 men CO2 7 Marks 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.
  - b) A sample of 500 members has a mean 2.5 cms and standard deviation 2.21 CO5 7 Marks 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.

## UNIT-V

- 9 a) A sample of 26 bulbs give a mean life of 990 hours with a standard CO2 7 Marks 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.
  - b) The measurements of the output of two units have given the following CO4 7 Marks 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

14 Marks

| Unit-A | 14.1 | 10.1 | 14.7 | 13.7 | 14.0 |
|--------|------|------|------|------|------|
| Unit-B | 14   | 14.5 | 13.7 | 12.7 | 14.1 |
|        |      |      |      |      |      |

10 4 coins were tossed 160 times and the following results were obtained.

| 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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Time: 3 hours

#### **SREE VIDYANIKETHAN ENGINEERING COLLEGE**

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(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]

Max. Marks: 70

SVEC-16

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.<br>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                                                        | CO1,        | 14 Marks |
|   |    | $f(z) = u + iv$ given that $u - v = (x - y)(x^2 + 4xy + y^2)$                                                         | CO3         |          |
|   |    | (OR)                                                                                                                  |             |          |
| 4 |    | Applying Milne-Thomson Technique, construct an analytic function of                                                   | CO3,        | 14 Marks |
|   |    | the form $f(z) = u + iv$ whose imaginary part is $e^{x}(x \cos y - y \sin y)$ .                                       | 005         |          |
|   |    | (UNIT-III)                                                                                                            |             |          |
| 5 |    | Write Cauchy's theorem and verify it for the function $f(z) = z + 1$ over the                                         | CO1,        | 14 Marks |
|   |    | boundary of the square with vertices $z = 0, z = 1, z = 1 + i, z = i$ .                                               | CO4         |          |
| 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 $\int \frac{\sin \pi z^2 + \cos \pi z^2}{(z-1)(z-2)} dz$ where <i>c</i> is the circle       | CO4         | 7 Marks  |
|   |    | z  = 3 using Cauchy's Integral formula.                                                                               |             |          |
|   |    | UNIT-IV)                                                                                                              |             |          |
| 7 | a) | Define pole of a function. Evaluate the product of poles of the function $z^2$                                        | CO1,<br>CO4 | 7 Marks  |
|   |    | $f(z) = \frac{1}{(z-1)(z-2)^2}$ at $z = 1, 2$ .                                                                       |             |          |
|   | 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 $\oint \frac{z-3}{cz^2+2z+5} dz$ where C is the circle $ z+1+i  = 2$ .                         | CO4         | 7 Marks  |
|   | b) | Evaluate the integral $\int_{0}^{\infty} \frac{dx}{(1+x^2)^2}$ by using the technique of finding                      | CO5         | 7 Marks  |
|   |    | residues.                                                                                                             |             |          |

## UNIT-V

- 9 a) Define a Bilinear transformation and show that Bilinear transformation CO1, 4 Marks preserves cross ratio of four points.
   CO4
  - b) What is the difference between isogonal and conformal transformations CO4 6 Marks and illustrate with an example.
  - c) Construct bilinear transformation whose invariant points are 1, i and CO3 4 Marks which maps 0 onto -1.

## (OR)

- 10 a) On applying the transformation  $w = \frac{1}{z}$  show that the hyperbola CO4 7 Marks  $x^2 y^2 = 1$ , maps onto the lemniscate  $\rho^2 = \cos 2\phi$ .
  - b) Construct a bilinear the transformation which maps the points -1, i, 1 CO3 7 Marks of the z plane onto 1, i, -1 of the w plane respectively

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Roll No.

SVEC-16

Max. Marks: 70

#### **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

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

## UNIT-I

| 1  | a)<br>b) | Compare renewable and non-renewable resources. Give examples.<br>Why is it necessary to create environmental awareness?                 | CO2<br>CO4 | 7 Marks<br>7 Marks |
|----|----------|-----------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|
|    | 0)       | (OR)                                                                                                                                    | 004        | / IviaiKS          |
| 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            |
|    |          |                                                                                                                                         |            |                    |
| 3  | a)       | What are the biotic and abiotic components of an acosystem?                                                                             | CO1        | 7 Marks            |
| 5  | a)<br>b) | How can you as an individual conserve biodiversity?                                                                                     | CO1        | 7 Marks            |
|    | 0)       | (OR)                                                                                                                                    | 007        | / Iviaiks          |
| 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           |
| (  | -)       | (UR)                                                                                                                                    | cor        | 7 ) (              |
| 6  | a)       | state now acid rain does is formed and what are the adverse effects on environment.                                                     | 02         | / 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                                                                      | CO8        | 14 Marks           |
|    |          | (Prevention and Control of Pollution) Act.                                                                                              |            |                    |
|    |          |                                                                                                                                         |            |                    |
| 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? <b>(OR)</b>                                                              | CO6        | 7 Marks            |
| 10 |          | Visit to a local industrial polluted area and prepare a document.<br>$\circledast \ \circledast \ \circledast$                          | CO9        | 14 Marks           |

Time: 3 hours

SVEC-16
Roll No.

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### MANAGERIAL ECONOMICS AND PRINCIPLES OF ACCOUNTANCY [ Civil Engineering ]

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,"<br>Elaborate.                                                     | CO2,<br>CO3 | 14 Marks |
|   | (OR)                                                                                                                               |             |          |
| 2 | Analyze and suggest a suitable demand forecasting technique for a new<br>and highly technical product being launched by a company. | CO2,<br>CO3 | 14 Marks |
|   | UNIT-II )                                                                                                                          |             |          |
| 3 | Highlight the "Cost-Volume-Profit" relationship with the help of neat graph.                                                       | CO1,<br>CO2 | 14 Marks |
|   | (OR)                                                                                                                               |             |          |
| 4 | Determine:<br>i) B.E.P.                                                                                                            | CO2,<br>CO5 | 14 Marks |
|   | 1) Sales required to earn a profit of Rs.40,000/                                                                                   |             |          |
|   | 111) BEP, when fixed cost increases by Rs.10,000/                                                                                  |             |          |
|   | 1V) BEP, when variable cost increases by RS.20 per unit.                                                                           |             |          |
|   | Variable Cost per unit Rs.200/-                                                                                                    |             |          |
|   | Fixed Cost Rs 1 00 000/-                                                                                                           |             |          |
|   | (UNIT-III)                                                                                                                         |             |          |
| 5 | Distinguish between Price Discrimination and Product Differentiation.<br>(OR)                                                      | CO2         | 14 Marks |
| 6 | Discuss the following.                                                                                                             | CO1         | 14 Marks |
|   | i) Objectives of Pricing.                                                                                                          |             |          |
|   | ii) Overpricing and Under pricing.                                                                                                 |             |          |
|   | UNIT-IV                                                                                                                            |             |          |
| 7 | From the following transactions pass necessary journal entries in the books of Meghana.                                            | CO2,<br>CO3 | 14 Marks |
|   | 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.                                                                                  |             |          |
|   | (OR)                                                                                                                               | ~ ~         |          |
| 8 | Discuss briefly various sources of capital for a business.                                                                         | CO1         | 14 Marks |



From the following Trail Balance of Shukla prepare Trading, Profit and Loss Account for the year ending 31<sup>st</sup> March, 2019 and Balance sheet as on the date.

CO4, 14 Marks

CO5, CO6

| 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:

9

10

- i) Closing Stock was valued at Rs 6,000/-
- ii) Depreciation Buildings by 10% and Loose Tools are evalued at Rs 3,500/-

#### (OR)

The trial balance of a firm on 31.12.2018 is as follows. Prepare final CO4, accounts of this firm. CO5,

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/-

Time: 3 hours

Roll No.

#### **SREE VIDYANIKETHAN ENGINEERING COLLEGE**

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### CONSTRUCTION PLANNING AND PROJECT MANAGEMENT

[ Civil Engineering ]

Max. Marks: 70

SVEC-16

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

## 

| 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 |
|   | ŕ  | (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                 | CO2 | 7 Marks |
|   |    | circumstances under which one is preferred over the other.                |     |         |
|   |    | (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      | CO4 | 7 Marks |
|   | -  | building project'.                                                        |     |         |
|   |    | Timefor                                                                   |     |         |

| Activity | Description                       | Time for<br>completion<br>(Weeks) |
|----------|-----------------------------------|-----------------------------------|
| А        | Site selection and survey         | 5                                 |
| В        | Design                            | 7                                 |
| С        | Preparation of Drawings           | 4                                 |
| D        | Preparation of specifications and | 3                                 |
|          | tender document                   |                                   |
| 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 CO1 8 Marks redundant dummies.

(OR)

- 8 a) Write a note on development of networks.
  - b) Differentiate between activity oriented diagram and event oriented CO2 6 Marks diagram.

## CO1 8 Marks
# UNIT-V

- 9 a) If the expected time along the critical path of a project is 27 weeks and the CO2 6 Marks standard deviation along it is 6 weeks, determine the probability of completing the project within a) 21 weeks, b) 24 weeks, c) 36 weeks.
  - b) The details of a network are given below where the duration is in days. CO2 8 Marks

| Activity | to | t <sub>m</sub> | tp |
|----------|----|----------------|----|
| 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 CO9 14 Marks project.

The data of each activity of network is given in the table. Indirect cost is Rs.4000/week.

| Activity | Normal Time<br>(Month) | Cost (Rs.) | Crash Time<br>(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

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

FLUID MECHANICS AND HYDRAULIC MACHINERY

# [ Civil Engineering ]

Time: 3 hours

Max. Marks: 70

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

# UNIT-I

| 1 | a) | Define density, specific gravity, viscosity and vapour pressure. Calculate the specific weight, specific mass, specific volume and specific gravity of a liquid having a volume of 6m <sup>3</sup> 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 <sup>2</sup> to maintain this speed. Find the viscosity of the fluid between the plates <b>(OR)</b>                                                                                | CO2 | 7 Marks |
| 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 <sup>2</sup> , determine torque required to overcome friction in bearing and power utilized in overcoming viscous resistance.                | CO2 | 7 Marks |
| 3 | a) | Explain the description of fluid motion and list out types of fluid flows                                                                                                                                                                                                                                             | CO1 | 8 Marks |
| 5 | u) | with an example.                                                                                                                                                                                                                                                                                                      | 001 | o mano  |
|   | b) | Describe types of flow lines and velocity for a two dimensional flow field<br>is given by $V = (3 + 2xy + 4t^2) i + (xy^2 + 3t) j$ . Find the velocity and<br>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                                                                                                                                                                                                                                             | CO5 | 7 Marks |

- horizontal pipe of 60 mm diameter. If the pressure drop in 100 m length of the pipe is 1800 kN/m<sup>2</sup>, determine rate of flow of oil, centre line velocity, total frictional drag over 100 m length and power required to maintain the flow.
  - b) Define Couette flow and describe flow of viscous fluid between two CO1 7 Marks parallel plates.

# UNIT-IV

- 7 a) List out types of channels and compare open channel flow and pipe flow. CO1 7 Marks What is the purpose of providing bed slope in open channels?
  - b) Classify flows and define energy and momentum correction factors. CO2 7 Marks 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.

### (OR)

- 8 a) Discuss the distribution of velocity in an open channel flow. Which CO1 7 Marks velocity is called relative velocity? How does an open channel flow differ from pressure flow?
  - b) A trapezoidal channel with base width 3m and side slope 2H: 1V carries a CO3 7 Marks 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.

# UNIT-V

- 9 a) State Impulse Momentum Principle. Derive an expression for impact of jet CO2 7 Marks 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.
  - b) Derive an expression for impact of jet of liquid on an inclined plate CO2 7 Marks 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.

### (OR)

- a) Derive an expression for impact of jet on a fixed curved plate. A jet of CO2 7 Marks 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.
  - b) Obtain an expression for force exerted by the jet of water on a inclined CO2 7 Marks 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.

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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

**MECHANICS OF SOLIDS** 

[Civil Engineering]

Time: 3 hours

4

Max. Marks: 70

# **Answer One Question from each Unit** All questions carry equal marks

# UNIT-I

- A compound bar consist of a central steel strip 25 mm wide and 6.4 mm CO5 1 14 Marks 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  $1.57 \times 10^5 \text{ N/mm}^2$  and
  - ii) The maximum axial pull the bar can then carry if the stress is not to exceed 157 N/mm<sup>2</sup>, in either the brass or steel.

Take the values of E for steel and brass as  $2.07 \times 10^5$  N/mm<sup>2</sup> and  $1.14 \times 10^5$ N/mm<sup>2</sup> respectively.

- (**OR**)
- 2 Define resilience. Derive the maximum stress intensity on a member of CO1 14 Marks 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



3 Determine the maximum shear force and bending moment of a Cantilever CO<sub>2</sub> 14 Marks beam shown in the figure and draw SFD and BMD.



(**OR**)

Determine the maximum shear force and bending moment of a Cantilever CO<sub>2</sub> 14 Marks beam shown in the figure and draw SFD and BMD.



Derive the maximum shear stress intensity for a solid circular section. 5 10 Marks CO1 a) A cast iron cantilever of length 2.5m fails when a load of 3kN applied at CO2 4 Marks b) the free end. Determine the stress at failure if the section of the cantilever is of 40mm x 60mm.

SVEC-16

- 6 A load of 75 kN is carried by a column of Cast iron. The external and CO2 14 Marks 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.

# UNIT-IV

- 7 a) A solid shaft of 200mm diameter has the same cross section area as that of CO6 7 Marks 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.
  - b) A solid shaft is 100mm in diameter. It transmits 110 kW at 200 r.p.m, find CO1 7 Marks the maximum intensity of shear stress induced and the angle of twist for a length of 6m.  $C=8\times10^4$  N/mm<sup>2</sup>.

### (**OR**)

- 8 a) A composite spring has two closed coiled springs connected in series; one CO4 7 Marks 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<sup>2</sup>. Take C= 80 GN/m<sup>2</sup>.
  - b) A helical spring B is placed inside the coil of a second helical spring A, CO2 7 Marks 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.

### UNIT-V

9 A cylindrical shell 4m long which is closed at the ends has an internal CO5 14 Marks 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<sup>2</sup>.

### (OR)

- 10 The external diameter of steel collar is 240mm and internal diameter is CO6 14 Marks 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:  $E= 205 \text{ GN/m}^2$ , and  $\mu = 0.304$ .

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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

### SURVEYING

### [ Civil Engineering ]

Time: 3 hours

Max. Marks: 70

CO1

6 Marks

SVEC-16

### 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 CO6 6 Marks against them?
  - b) The length of a Survey line was measured with a 20m chain and was CO2 8 Marks 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.

#### (OR)

- 2 a) What are offsets? What are the types of offsets and method of taking CO1 10 Marks offsets?
  - b) The following perpendicular offsets were taken from a chain line to a CO2 4 Marks hedge

| 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.
  - b) The following staff readings were observed successively with a level. The CO4 8 Marks 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.

#### (OR)

4 Explain the tracing paper method of solving the Three Point problem. CO1 14 Marks What is the practical utility of the solution to Three Point problem in the field?

### UNIT-III)

5 A closed traverse ABCDEA was run in the counter clockwise direction, CO3 14 Marks and the following data were obtained.

| Line | Length (m) | Included angle                     |
|------|------------|------------------------------------|
| AB   | 186        | Angle $A = 118^{\circ} 20^{\circ}$ |
| BC   | 164        | Angle $B = 82^{\circ} 10^{1}$      |
| CD   | 303        | Angle $C = 130^{\circ} 00^{1}$     |
| DE   | 162        | Angle D = $73^{\circ} 44^{1}$      |
| EA   | 240        | Angle $E = 128^{\circ} 36^{\circ}$ |

The bearing of AB was  $24^{\circ} 30^{\circ}$ . 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  |
|    |    |                                                                                                                                                                                                        |     |          |
| 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  |
|    |    | \$P \$P \$P                                                                                                                                                                                            |     |          |

Time: 3 hours

Roll No.

### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

### **DC MACHINES**

#### [Electrical and Electronics Engineering]

Answer One Question from each Unit All questions carry equal marks Max. Marks: 70

SVEC-16

# UNIT-I )

1 Illustrate various methods of excitation of DC machines with neat circuit CO1 7 Marks a) diagrams and deduce the relationships between generated emf and terminal voltage. A short compound wound DC generator supplies a load current of 150 A 7 Marks b) CO4 at 230 V. Calculate the emf generated, if the resistance of armature, series field and shunt field windings are  $0.15\Omega$ ,  $0.1\Omega$  and  $100\Omega$  respectively. Assume the brush drop 1 Volt per brush. (**OR**) 2 Differentiate separately and self-excited DC generators. CO1 3 Marks a) Derive the condition for maximum efficiency of DC generator. b) CO<sub>2</sub> 4 Marks A short-shunt DC compound generator supplies 200A at 100V. The CO4 7 Marks c) resistance of armature, series filed and shunt field windings are 0.04, 0.03 and  $60\Omega$  respectively. Find the **emf** generated. Also find the **emf** generated if same machine is connected as a long-shunt machine. UNIT-II Derive the expressions for demagnetizing and cross-magnetizing ampere 3 a) CO<sub>2</sub> 8 Marks turns per pole in a DC machine with neat sketch. A 6-pole, 148 A DC shunt generator has 480 conductors and is waveb) CO4 6 Marks wound. Its field current is 2A. Find the demagnetizing and crossmagnetizing ampere turns per pole at full load if (i) brushes are on GNA and (ii) brushes are shifted from GNA by 50 electrical degrees. (**OR**) 4 Discuss in detail the detrimental effects of armature reaction in DC 7 Marks CO1 a) machines. With relevant illustrations explain the role of compensating winding in a CO1 7 Marks b) DC machine. UNIT-III) 5 The magnetization curve of a DC shunt generator at 1500 r.p.m is as CO1 14 Marks follows.  $I_{f}(A)$ 0 0.4 0.8 1.2 1.6 2.0 2.4 2.8 3.0  $E_{\sigma}(V)$ 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  $100 \Omega$
- 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  $\Omega$ .

### (OR)

1

6 a) Parallel operation of DC series generators is not stable. Justify.

b) A DC series generator having an external characteristics which is a CO4 8 Marks straight line through zero to 50 V at 200 A connected as a booster between station bus bar and a feeder of 0.3  $\Omega$  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

# UNIT-IV

- 7 a) Drive the expression for torque developed by a DC motor from CO2 5 Marks fundamentals.
  - b) Select and describe the suitable speed control technique for DC shunt CO5 4 Marks motor which is used to control the speed above rated value.
  - c) A shunt motor operating on 230 V takes an armature current of 6 A at no- CO4 5 Marks load and runs at 1200 r.p.m. Take Ra =  $0.25 \Omega$ . Find the speed and the electromagnetic torque when the armature takes 36 A with the same flux.

### (OR)

- 8 a) DC shunt motor is suitable to drive agricultural pump set. Justify.
  - b) A 220 V shunt motor has an armature resistance of 0.5  $\Omega$ . The armature CO3 8 Marks 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.

# UNIT-V

9 A test on two coupled similar tramway motors, with their fields connected CO4 14 Marks 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 =  $0.3 \Omega$ 

Compute the efficiency of the motor and generator at this load.

### (**OR**)

- 10 a) Mention the advantages and disadvantages of no-load test.
  - b) Explain running down test for finding stray losses of DC machine.
    - 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.

\$} {} {}

CO1 3 Marks

CO1 5 Marks CO4 6 Marks

CO1

CO5

6 Marks

6 Marks

### 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 Ouestion from each Unit** All questions carry equal marks

### UNIT-I

- Explain the terms electric field intensity and electric flux density with CO1 1 a) 7 Marks necessary mathematical relations. Find the total charge in a volume defined by six planes for which CO3 b) 7 Marks  $1 \le x \le 2, 2 \le y \le 3$  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<sup>3</sup>. (**OR**) 2 Define potential gradient and obtain a relation between electric field CO1 7 Marks a) intensity and potential. Find the electric field intensity at the point (1, -2, 1) m given the potential CO3 b) 7 Marks  $V = 3x^2y + 2yz^2 + 2xyz.$ UNIT-II) 3 Derive the expression for energy stored in a capacitor. CO<sub>2</sub> 7 Marks a) A capacitor consists of square shape metal plates of each 80cm side placed CO3 7 Marks b) 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. (OR)Derive the expression for the relaxation time and show that the relaxation CO<sub>2</sub> 4 a) 7 Marks time is short for good conductors. An electric dipole located at the origin in free space has a moment CO3 b) 7 Marks  $\overline{p} = (4\overline{a}_x + 3\overline{a}_y + 3\overline{a}_z)nCm$ . Determine i) Potential, V at point Q(1, 2, 3). ii) Electric field intensity at  $Q(4, 20^0, 0^0)$ . (UNIT-III) Define magnetic field intensity and magnetic flux density. Obtain the CO1 5 a) 7 Marks relation between them. Derive the expression for magnetic field intensity. b) CO2 7 Marks i) At the centre. ii) On the axis of circular conductor carrying 'T amperes of current. (**OR**) Explain how laws of electromagnetics can be applied in MRI machine. 6 a) CO5 7 Marks A Toroid has 'N' turns and carries current of 'I' amperes. Determine b) CO5 7 Marks magnetic field strength inside and outside the toroid. (UNIT-IV) 7 Define the terms dipole moment and magnetization and establish a CO1 7 Marks a) relation between them.
  - Describe about the boundary conditions pertaining to the magnetic CO1 7 Marks b) materials.

8 a) Derive the expression for force due to:

ii) Differential current element.

b) If a point charge of 3 coulombs moves with a velocity of CO3 7 Marks  $\vec{u} = 7\vec{a_x} + 4\vec{a_y} - 6\vec{a_z}$  m/s, find the force exerted on the charge.

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  $\overline{B} = 6\overrightarrow{a_x} + 5\overrightarrow{a_y} + 6\overrightarrow{a_z}wb/m^2$ .

UNIT-V

- 9 a) Write the Maxwell's equations in both point form and integral forms for CO1 7 Marks free space and good conductor.
  - b) A parallel plate capacitor with plate area of  $5\text{cm}^2$  and plate separation of CO3 7 Marks 3mm has a voltage  $50\sin 10^3$ t Volts applied to its plate. Calculate displacement current density. Assume  $\varepsilon = 2\varepsilon_0$ .

### (OR)

- 10 a) Given  $\vec{B} = (0.5\vec{a_x} + 0.6\vec{a_y} 0.3\vec{a_z})\cos(500t)$  Tesla and a filamentary CO3 7 Marks 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.
  - b) Find the displacement current density within a parallel plate Capacitor CO3 7 Marks where  $\varepsilon = 100\varepsilon_0$ ,  $a=0.01\text{m}^2$ , d = 0.05mm and the capacitor Voltage is 100sin200  $\pi$ t volts.

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**CODE No.: 16BT30203** SVEC-16 Roll No. SREE VIDYANIKETHAN ENGINEERING COLLEGE (An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu) II B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021 SIGNALS, SYSTEMS AND NETWORKS [Electrical and Electronics Engineering] Time: 3 hours Max. Marks: 70 **Answer One Question from each Unit** All questions carry equal marks UNIT-I 1 a) Explain power and energy signal and enumerate the necessary conditions CO1 7 Marks for the signal to be a power or energy signal. Determine the total response of the system described by: b) CO<sub>4</sub> 7 Marks  $\frac{d^2 y(t)}{dt^2} + \frac{dy(t)}{dt} + 0.21y(t) = \frac{dx(t)}{dt} + x(t); where x(t) = 0.2e^{-0.5t}u(t)$ With the initial conditions y'(0) = -1; y(0) = 0.3. (**OR**) Define convolution of two continuous time signals. 2 CO1 6 Marks a) Find the convolution of the two signals x(t) and h(t) in Figure. CO<sub>4</sub> 8 Marks b) h(t)x(t)2 0 1 + UNIT-II 3 Find the response of a system described by  $\frac{dy(t)}{dt} + 2y(t) = x(t)$ ; using the CO5 7 Marks a) Fourier transform. Where the input is defined as  $x(t) = e^{-t} u(t)$ . b) Find the Fourier series for the triangular wave shown in Figure. CO<sub>4</sub> 7 Marks Π (**OR**) Find the Laplace transform of the following signals: 4 CO5 7 Marks a) f(t) = (2t + 4) u(t) and f(t) = (4 + 3e) u(t). A circuit has a transfer function  $H(s) = \frac{s+4}{(s+1)(s+2)^2}$ , determine the CO4 7 Marks b) impulse response. UNIT-III) 5 Explain the transient properties of a capacitor for DC and AC excitations. a) CO1 6 Marks In the circuit shown below, the switch is initially in closed position for a CO<sub>4</sub> 8 Marks b) long time and opened at time t = 0. Find the current i(t) for t > 0.



6 a

- a) A DC voltage of 20V is applied at t=0 in a R-L circuit where CO4 7 Marks R=50hmsand L=10H. Find the Time constant and the maximum value of stored energy during the transient.
  - b) A series RL circuit with  $R = 100 \Omega$  and L = 10 mH has a Sinusoidal CO4 7 Marks excitation V (t) = 250Sin500t. Find the total current using differential equation method assuming that the capacitor is initially uncharged.

- 7 a) Express hybrid parameters in terms of admittance parameters for a CO1 7 Marks generalized network.
  - b) Find the y parameters for the two-port network shown in Figure. CO4 7 Marks Invistigate the netwok for symmetry and reciprocity.



(**OR**)

- 8 a) State the necessary conditions for a network function to be a driving point CO1 6 Marks function.
  - b) Find the hybrid parameters of the network in Figure. Invistigate the netwok CO4 8 Marks for symmetry and reciprocity.



- 9 a) Analyze the nature of characteristic impedance in pass band and stop CO2 6 Marks bands with relevant equations.
  - b) In a signal processing application, it is required to allow only the CO6 8 Marks frequencies ranging between 12 kHz to 16 kHz which is connected to an load impedance of 600  $\Omega$ . Justify a suitable proto type filter circuit with proper components and their specifications.

### (OR)

- 10 a) Derive the design equations for a High pass T-section filter.CO26 Marks
  - b) Design a constant k filter to eliminate band of frequencies lying between CO3 8 Marks 2000Hz and 6000Hz with a design impedance of 600  $\Omega$ . Also determine attenuation and phase shift 1 kHz and 4 kHz.

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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

### **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)<br>b) | Describe the constructional details of DC machine.<br>A 4-pole wave connected DC generator having 60 slots on its armature<br>with 6 conductors per slot, run at 750 r.p.m and generates an open circuit                                                                                                | CO1<br>CO4 | 10 Marks<br>4 Marks |
|---|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------------|
|   |          | voltage of 230V. Find the useful flux per pole.                                                                                                                                                                                                                                                         |            |                     |
| 2 | a)       | Derive the e m f equation of DC generator                                                                                                                                                                                                                                                               | CO2        | 7 Marks             |
| 2 | 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 7.8 $\Omega$ and 0.0085 $\Omega$ 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)       | <ul> <li>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: <ol> <li>Efficiency at full load.</li> <li>The load at which maximum efficiency occurs.</li> <li>The maximum efficiency.</li> </ol> </li> </ul>         | 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,<br>400V system. The current in phase is 30 A and lags behind phase voltage<br>by 30°. Find:<br>i) The impedance in each phase.<br>ii) The total power.                                                                         | CO4        | 7 Marks             |
|   |          |                                                                                                                                                                                                                                                                                                         |            |                     |

#### (**OR**)

- 6 a) Prove that two wattmeters are enough to measure the total power of a CO2 7 Marks three phase unbalanced system with a neat phasor diagram.
  - b) Three equal impedances each having a resistance and reactance of  $25\Omega$  CO4 7 Marks and  $40\Omega$  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.

# UNIT-IV

7 a) Explain the constructional features of an alternator.

b)

 b) A 12-pole, 3 phase alternator is coupled to an engine running at 500 r.p.m. CO4 7 Marks 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.

### (OR)

8 a) Discuss the constructional features of salient pole type alternator. CO1 3 Marks

List out the applications of three phase induction motors. CO6 4 Marks

7 Marks

CO1

c) An alternator on open-circuit generates 360V at 60Hz when the field CO4 7 Marks 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.

### UNIT-V

- 9 a) Discuss about the double field revolving theory in single phase induction CO1 7 Marks motor.
  - b) Why the starting torque of a capacitor start induction motor is better than CO2 7 Marks that of a resistance start motor? Explain.

### (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 CO1 7 Marks applications.

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Time: 3 hours

Roll No.

### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

### KINEMATICS OF MACHINERY

[ Mechanical Engineering ]

Max. Marks: 70

SVEC-16

#### 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 CO1 14 Marks with suitable sketches.

### (OR)

2 a) Classify and explain the types of Kinematic pairsCO1 10 Marksb) What is Grubler's criterion?CO1 4 Marks

### UNIT-II

- In a slider crank mechanism, the crank OB is 30mm and the connecting CO2 14 Marks rod BC is 120mm long. The crank rotates at 300 r.p.m clockwise and makes 60<sup>o</sup> from IDC. Find
  - i) The velocity of piston C.
  - ii) Angular velocity of connecting rod BC.

### (OR)

4 In a four bar mechanism PQRS, PS is fixed link of length 120mm. Crank CO2 14 Marks PQ is 45mm rotates at 200 r.p.m and an acceleration of 150 rad/sec<sup>2</sup> at an instant when crank makes an angle 45<sup>°</sup> 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.

### (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 CO1 14 Marks two main steering gears and discuss their relative advantages.

### UNIT-IV

- 7 An epi-cyclic gear train consists of an arm 'a' and two gears P and S CO4 14 Marks 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.



(**OR**)

- 8 a) Find an expression for the length of the path of contact between two CO3 6 Marks mating spur gears.
  - b) Two mating involute spur gears have 28 and 45 teeth and a standard CO3 8 Marks 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<sup>o</sup>.

# UNIT-V

- A cam with 40 mm minimum radius is rotating clockwise at uniform CO5 14 Marks 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  $90^{\circ}$ .
  - of cam rotation with uniform velocity.
  - ii) Dwell for the next 30<sup>°</sup>.
  - iii) Follower is to return to its starting position with SHM during next 120<sup>0</sup>.
  - 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.

### (OR)

10 From the following data draw the cam profile in which the following CO6 14 Marks 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 =  $48^{\circ}$ , angle of descent=  $60^{\circ}$ , angle of dwell between ascent and descent =  $42^{\circ}$ , 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.

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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

### MANUFACTURING TECHNOLOGY

[ Mechanical Engineering ]

Max. Marks: 70

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

# (UNIT-I)

| 1  | a)<br>b) | Write types of pattern allowances and sketch any two of them.<br>Explain the design considerations are needed to be followed in Gating system. | CO1<br>CO3 | 7 Marks<br>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<br>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<br>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            |
|    |          |                                                                                                                                                |            |                    |
| 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            |
| 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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SVEC-16

Time: 3 hours

### 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

5 Marks

CO1

SVEC-16

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

# UNIT-I

- 1 a) Write a short note on strain energy.
  - b) A rectangular block 350mm long, 100mm wide and 80mm thick is CO2 9 Marks 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<sup>2</sup> and Poisson's ratio 0.25.

### (OR)

- 2 a) Draw the stress strain curve for brittle materials and explain the salient CO6 6 Marks points on it.
  - b) Derive a relation for change in length of a uniformly varying circular bar CO1 8 Marks subjected to an axial load 'P'.

# UNIT-II)

3 Draw the shear force and bending moment diagram for the overhanging CO6 14 Marks 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.



(OR)

- 4 a) Draw the shear force and bending moment diagram for a cantilever beam CO2 6 Marks of length 'L' carrying a uniformly distributed load of W kN/m over the entire span representing maximum values.
  - b) Draw the shear force and bending moment diagram for a cantilever simply CO6 8 Marks supported beam loaded as shown in fig 2.





# UNIT-III)

5 The internal and external diameter of a hollow shaft is in the ration of 2:3. CO3 14 Marks 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  $G = 0.85 \times 10^5$  MPa.

### (OR)

- 6 a) Define 'simple bending' or 'pure bending'. List the assumptions made in CO1 4 Marks the theory of simple bending.
  - b) A cast iron beam is of T-section of flange 100mm x 20mm and web CO3 10 Marks 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.

# UNIT-IV

7 A beam of length 6m is simply supported at its ends and carries two point CO5 14 Marks 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<sup>4</sup>.

### (OR)

- 8 A beam of uniform rectangular section 200mm wide and 300mm deep is CO5 14 Marks 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  $1 \times 10^4$  N/mm<sup>2</sup>, find:
  - i) The slope at the supports.
  - ii) Maximum deflection.

# UNIT-V

9 A cylindrical shell 1m diameter and 3m length is subjected to an internal CO3 14 Marks 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<sup>2</sup>.

### (OR)

- 10 a) Show that in thin cylindrical shells subjected to internal fluid pressure, the CO2 4 Marks circumferential stress is twice the longitudinal stress.
  - b) Determine the maximum and minimum hoop stress across the section of a CO4 10 Marks pipe of 400mm internal diameter and 100mm thick, when the pipe contains a fluid at a pressure of 8 N/mm<sup>2</sup>.

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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

2

Max. Marks: 70

CO3

4 Marks

10 Marks

SVEC-16

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

# UNIT-I

- What is meant by point and path function? Explain with one example CO1 1 6 Marks a) each. CO1 8 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.

### (**OR**)

What is meant by quasi static process and explain it with the neat sketch. CO1 6 Marks a) 8 Marks b) A fluid is confined in a cylinder by a spring loaded frictionless piston so CO2 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.

# UNIT-II

3 Derive the steady flow energy equation with all the assumptions made and CO1 14 Marks give the equations when it is applied to i) Boiler, ii) Condenser ii) Nozzle, iv)Turbine, v)Compressor

### (**OR**)

- 4 State the First Law of Thermodynamics and prove that for a non-flow CO1 4 Marks a) process, it leads to the energy equation  $Q = \Delta U + W$ .
  - A reversible heat engine operating between reservoirs at 900K and 300K CO2 10 Marks b) 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.

# UNIT-III)

- 5 Discuss the concept of entropy and importance of T-s diagram. a)
  - An insulated 0.75 kg copper calorimeter can containing 0.2 kg water is in b) CO3 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?

2

- 6 Derive expressions for entropy changes for a closed system in the CO3 a) 4 Marks following cases :
  - i) Heating a gas at constant volume.
  - ii) Heating a gas at constant pressure.
  - Air at 20°C and 1.05 bar occupies 0.025m<sup>3</sup>. The air is heated at constant CO3 b) 10 Marks 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

# UNIT-IV

- 7 Draw the phase change process for pure substance or steam formation and CO1 a) 4 Marks explain
  - A closed vessel of 0.2 cubic meter contains steam at 1 Mpa and CO4 10 Marks b) 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.

#### (**OR**)

- 8 Write the following: a)
  - i) Mole fraction and Mass fraction.
  - ii) Gravimetric Analysis and Volumetric Analysis.
  - A vessel having a volume of  $0.6 \text{ m}^3$  contains 3.0 kg of liquid water and CO4 8 Marks b) 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.

# UNIT-V

- Derive the expression to find the efficiency of air standard dual cycle with 9 a) CO4 4 Marks the help of p-v and t-s diagram.
  - An I.C. engine operating on the dual cycle (limited pressure cycle) the b) CO5 10 Marks 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  $\gamma$  for air = 1.4.

### (**OR**)

- 10 Write the assumption in air standard cycles. a)
  - An engine with 200mm cylinder diameter and 300mm stroke works on CO5 b) 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.

(j) (P) (f) CO3 6 Marks

- CO1 4 Marks
  - 10 Marks

### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

# ELECTRONIC CIRCUIT ANALYSIS AND DESIGN

[Electronics and Communication Engineering]

Max. Marks: 70

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

# UNIT-I

| 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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| a)         | List the classification of BJT amplifiers.                                                                                                                                                                 | CO2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 7 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| b)         | Apply cascading concept to get large voltage gain and explain with block                                                                                                                                   | CO6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 7 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|            | diagram.                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|            | UNIT-II                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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| a)         | Derive the expressions for hybrid $\Pi$ conductances $g_{ce}$ , $g_{bb}$ , and $g_m$ of a                                                                                                                  | CO3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 7 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| ,          | transistor.                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| b)         | For a given CE amplifier with $\beta$ =100, $I_c$ =5mA, $V_{ce}$ =10V, $h_{ie}$ =800,                                                                                                                      | CO4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 7 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| ,          | $h_{oe}=10^{-4}$ , $r_e=10^{-4}$ . Take $f_T=50$ MHz and $C_{ob}=3$ pF. Compute $g_m$ and $g_{b'e}$ .                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|            | (UNIT-III)                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| a)         | Draw the RC phase shift oscillator circuit with BJT and explain its                                                                                                                                        | CO1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 7 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|            | operation.                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| b)         | Select a Trans-conductance amplifier and prove its input and output                                                                                                                                        | CO5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 7 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|            | impedances are very large compared to CE amplifier.                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| a)         | Select a Trans-Resistance amplifier and prove its input and output                                                                                                                                         | CO5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 7 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>b</b> ) | Impedances are very large compared to CE amplifier.                                                                                                                                                        | CO1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 7 Mortra                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 0)         | Draw the Hartley oscillator with BJ1, explain its operation and derive an                                                                                                                                  | COI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | / WIAIKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|            |                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|            | UNIT-IV                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 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)                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| a)         | A push pull amplifier utilizes a transformer whose primary has a total of                                                                                                                                  | CO4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 7 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|            | 160 turns and whose secondary has 40 turns. It must be capable of                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|            | delivering 40W to an 8 $\Omega$ load under maximum power conditions. What is                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 1.)        | the minimum possible value of $V_{cc}$ ?                                                                                                                                                                   | 001                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 7 1 ( 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| D)         | Explain Class A series led power amplifier with neat circuit diagram.                                                                                                                                      | COI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | / IVIARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|            | <ul> <li>a)</li> <li>b)</li> </ul> | <ul> <li>a) List types of coupling schemes used in multistage amplifiers.</li> <li>b) Apply cascading technique to construct a Direct coupled amplifier.<br/>(OR)</li> <li>a) List the classification of BJT amplifiers.</li> <li>b) Apply cascading concept to get large voltage gain and explain with block diagram.</li> <li>UNIT-II</li> <li>a) Discuss Low and High frequency analysis of an Amplifier.</li> <li>b) Apply Short circuit concept in a CE amplifier to derive Current gain equation.<br/>(OR)</li> <li>a) Derive the expressions for hybrid Π conductances g<sub>ce</sub>, g<sub>bb</sub>, and g<sub>m</sub> of a transistor.</li> <li>b) For a given CE amplifier with β=100, I<sub>c</sub>=5mA, V<sub>cc</sub>=10V, h<sub>ic</sub>=800, h<sub>oc</sub>=10<sup>-4</sup>, r<sub>e</sub>=10<sup>-4</sup>. Take f<sub>T</sub>=50MHz and C<sub>ob</sub>=3pF. Compute g<sub>m</sub> and g<sub>b'e</sub>.</li> <li>UNIT-III</li> <li>a) Draw the RC phase shift oscillator circuit with BJT and explain its operation.</li> <li>b) Select a Trans-conductance amplifier and prove its input and output impedances are very large compared to CE amplifier.<br/>(OR)</li> <li>a) Select a Trans-Resistance amplifier and prove its input and output impedances are very large compared to CE amplifier.</li> <li>b) Draw the Hartley oscillator with BJT, explain its operation and derive an expression for frequency of oscillations.</li> <li>i) Draw the Jardie S power amplifier efficiency is 78.5%.</li> <li>b) Write short notes on distortion occur in power amplifiers (OR)</li> <li>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<sub>cc</sub>?</li> <li>b) Explain Class A series fed power amplifier with neat circuit diagram.</li> </ul> | a) List types of coupling schemes used in multistage amplifiers. CO2<br>b) Apply cascading technique to construct a Direct coupled amplifier. CO6<br>(OR)<br>a) List the classification of BJT amplifiers. CO2<br>b) Apply cascading concept to get large voltage gain and explain with block diagram.<br>(UNIT-II)<br>a) Discuss Low and High frequency analysis of an Amplifier. CO3<br>b) Apply Short circuit concept in a CE amplifier to derive Current gain CO6<br>equation. (OR)<br>a) Derive the expressions for hybrid $\Pi$ conductances $g_{ee}$ , $g_{bb}$ , and $g_m$ of a CO3<br>transistor. (OR)<br>b) For a given CE amplifier with $\beta$ =100, $I_c$ =5mA, $V_{ee}$ =10V, $h_{ie}$ =800, CO4<br>$h_{oe}$ =10 <sup>-4</sup> , $r_e$ =10 <sup>-4</sup> . Take $f_T$ =50MHz and $C_{ob}$ =3pF. Compute $g_m$ and $g_{bv}$ .<br>(UNIT-III)<br>a) Draw the RC phase shift oscillator circuit with BJT and explain its<br>co1 operation.<br>b) Select a Trans-conductance amplifier and prove its input and output<br>impedances are very large compared to CE amplifier.<br>b) Draw the RC phase shift oscillator with BJT, explain its operation and derive an<br>co1 impedances are very large compared to CE amplifier.<br>co1 impedances are very large compared to CE amplifier.<br>co2 impedances are very large compared to CE amplifier.<br>co3 b) Write short notes on distortion occur in power amplifiers<br>co1 impedances are very large compared to CE amplifier.<br>co3 b) |

Time: 3 hours

# UNIT-V

- 9 a) Design a single tuned amplifier for the following specifications. Centre CO3 7 Marks frequency of 500 KHz and a Band width of 10KHz. Assume the transistor parameters  $g_m = 0.04S$ ,  $h_{fe} = 100$ ,  $c_{b'e} = 1000pF$ ,  $C_{b'e} = 100pF$ . The bias network and input resistance are adjusted such that  $R_i = 4K\Omega$  and  $R_L = 510\Omega$ .
  - b) A class C amplifier has a base bias voltage of -5V and  $V_{cc} = 30$  V. It is CO4 7 Marks 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.

(**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, CO4 7 Marks capacitive coupled amplifiers. List the assumptions made for the derivation.

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| COI | DE No    | .: 16BT30402                                                                                                                                                                                                |            | SVEC-16             |
|-----|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------------|
|     |          | Roll No.                                                                                                                                                                                                    |            |                     |
|     |          | SREE VIDYANIKETHAN ENGINEERING COLLEGE<br>(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)                                                                                                   |            |                     |
|     | Ι        | I B.Tech I Semester (SVEC-16) Supplementary Examinations Aug                                                                                                                                                | ust – 2(   | )21                 |
|     |          | SIGNALS AND SYSTEMS<br>[Electronics and Communication Engineering ]                                                                                                                                         |            |                     |
| Tim | e: 3 h   | ours                                                                                                                                                                                                        | Max. I     | Marks: 70           |
|     |          | Answer One Question from each Unit<br>All questions carry equal marks                                                                                                                                       |            |                     |
|     |          | UNIT-I                                                                                                                                                                                                      |            |                     |
| 1   | a)       | Bring out the relation between:                                                                                                                                                                             | CO2        | 7 Marks             |
|     | b)       | i) Signum and step function.<br>ii) Sinusoidal and exponential functions based on their properties.<br>Given a signal $x(t) = t  0 < t < 2$                                                                 | CO4        | 7 Marks             |
|     |          | = 2  t > 2  t > 2<br>= 0 elsewhere<br>Plot the following signals $x(2t)  x(t)  x(t/2)  7x(-2t+3)$                                                                                                           |            |                     |
|     |          | ( <b>OR</b> )                                                                                                                                                                                               |            |                     |
| 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             |
| 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)<br>b) | What are the difference between Fourier series and Fourier transform?<br>Find the Fourier transform of the following.<br>i) $x(t) = A \sin(2\pi fct) U(t)$ .<br>ii) $x(t) = A rect(t / T) \cos(2\pi fct)$ . | CO1<br>CO2 | 4 Marks<br>10 Marks |
|     |          | (UNIT-III)                                                                                                                                                                                                  |            |                     |
| 5   | a)       | A filter has an input $x(t)=e^{-2t}u(t)$ and transfer function, $H(W)=1/(1+jw)$ .<br>Find ESD of the output.                                                                                                | CO3        | 8 Marks             |
|     | b)       | Discuss about the properties of convolution.<br>(OR)                                                                                                                                                        | CO1        | 6 Marks             |
| 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             |
| 7   | a)       | find the Laplace transform of the following waveform $x(t) \blacklozenge$                                                                                                                                   | CO4        | 9 Marks             |
|     |          |                                                                                                                                                                                                             |            |                     |
|     | b)       | U a 2a 3a 4a 5at(sec)<br>State and prove the time shifting and time integration property of Laplace<br>transform                                                                                            | CO1        | 5 Marks             |

(OR)

| 8  | a) | Obtain the Laplace Transform of a gate function and define ROC and with                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 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 $x(t) = 3\cos 100\pi t$ which is to be transmitted into free                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | CO5 | 10 Marks |
|    |    | <ul> <li>i) Determine minimum sampling rate to avoid alaising.</li> <li>ii) Suppose that the signal is sampled at a rate fs=200Hz, what is the discrete time signal obtained after sampling ?</li> <li>iii) Suppose the signal is sampled at a rate fs=75hz, what is the discrete time signal obtained after smapling ?</li> <li>iv) What is the frequency 0<f<fs (iii)="" 2="" a="" above="" band?<="" compare="" frequency="" identical="" in="" li="" obtained="" of="" samples="" sinusoid="" standard="" that="" the="" them="" those="" to="" transmission="" values="" with="" yeilds=""> </f<fs></li></ul> |     |          |
|    | b) | Examine the conditions on pole location for stability.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | CO2 | 4 Marks  |
|    | ,  | (OR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |          |
| 10 | a) | The final value of a system whose input $\mathbf{x}(t)=(2+e^{-3t})\mathbf{u}(t)$ is obviously $\mathbf{x}(\alpha)$ =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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SVEC-16

Max. Marks: 70

### SREE VIDYANIKETHAN ENGINEERING COLLEGE

### (An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

Roll No.

### 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

### 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) busing odd parity.       | CO6                        | 6 Marks    |
|---|------------|--------------------------------------------------------------------------------------------------|----------------------------|------------|
|   | b)         | Express the Gray code equivalent for the binary numbers.                                         | CO4                        | 8 Marks    |
|   |            | i) $(110010101)_2$ (ii) $(101111001)_2$                                                          |                            |            |
|   |            | iii) $(111010111)_2$ (iv) $(111111011)_2$                                                        |                            |            |
| - |            | (OR)                                                                                             | <b>G G G G G G G G G G</b> |            |
| 2 | a)         | Determine the error bit location for the received information $(0100011)_2$                      | CO6                        | 6 Marks    |
|   | <b>b</b> ) | using even parity.<br>Simplify the following Boolean function to minimum number of literals      | CO4                        | 8 Marks    |
|   | 0)         | and convert them from Standard SOP to Standard POS and SPOS to SSOP                              | 04                         | o Iviaiks  |
|   |            | respectively                                                                                     |                            |            |
|   |            | (i) $F(A, B, C) = \Sigma (0, 2, 4, 6, 7, 9, 10, 12, 14),$                                        |                            |            |
|   |            | (ii) $F(A, B, C) = \pi (1, 3, 4, 5, 7, 8, 10, 11, 15)$                                           |                            |            |
|   |            | UNIT-II)                                                                                         |                            |            |
| 3 | a)         | Simplify the Boolean function using K-map in SOP forms.                                          | CO2                        | 7 Marks    |
|   |            | $F=\sum m(0, 1, 2, 4, 7, 8, 12, 14, 15, 16, 17, 18, 20, 24, 28, 30, 31).$                        |                            |            |
|   | b)         | Minimize the criterion the following using K-map.                                                | CO3                        | 7 Marks    |
|   |            | $F(A, B, C, D) = \Sigma m (0, 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 13).$                              |                            |            |
| 1 | a)         | (OR)                                                                                             | $CO^{2}$                   | 7 Marka    |
| 4 | a)         | $V(w \neq y \neq z) = \sum m(1 \neq 2 \neq 5 \neq 12 \neq 14 \neq 15) + \sum d(4 \neq 2 \neq 1)$ | COS                        | / IVIAIKS  |
|   | b)         | Simplify the following Boolean function using tabulation method                                  | CO2                        | 7 Marks    |
|   | 0)         | $F(A,B,C,D)=\Sigma m(3,4,5,7,8,9,12,13,14)$                                                      | 002                        | , 1.101110 |
|   |            | (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                            | CO1                        | 6 Marks    |
|   |            | registers.                                                                                       |                            |            |
|   |            | (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.                               | COI                        | / Marks    |
| - | ``         |                                                                                                  | 004                        | 7 ) ( 1    |
| 1 | a)         | Describe race-around problem in JK Flip-flop. Explain how it is                                  | CO4                        | / Marks    |
|   | b)         | Design a Sequential circuit using IK Flip flop from the following state $\frac{1}{2}$            | CO6                        | 7 Marks    |
|   | 0)         | diagram                                                                                          | 000                        |            |
|   |            |                                                                                                  |                            |            |
|   |            | 00                                                                                               |                            |            |
|   |            |                                                                                                  |                            |            |
|   |            |                                                                                                  |                            |            |
|   |            |                                                                                                  |                            |            |

10

(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                       | CO5 | 7 Marks |  |  |
|    |      | $F_1 = \Sigma m(0,4,7), F_2 = \Sigma m(1,3,6), F_3 = \Sigma m(1,2,4,6).$ |     |         |  |  |
|    | b)   | Design a combinational using a PROM. The circuit accepts 3-bit           | CO3 | 7 Marks |  |  |
|    |      | binary number and generates its equivalent gray code.                    |     |         |  |  |
|    | (OR) |                                                                          |     |         |  |  |
| 10 | a)   | Derive the PAL programming table for the combinational circuit that      | CO5 | 7 Marks |  |  |
|    |      | squares a 3 bit number.                                                  |     |         |  |  |
|    | b)   | Explain in detail the different types of ROMS.                           | CO1 | 7 Marks |  |  |
|    |      | \$P \$P \$P                                                              |     |         |  |  |

### 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]

Max. Marks: 70

SVEC-16

Time: 3 hours

### 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 $f_{\beta} f_{T}$ and $f_{\alpha}$ and state the relation between $f_{\beta}$ and $f_{T}$ . | CO1  | 6 Marks |
|   |     | OR)                                                                                                |      |         |
| 2 | a)  | Derive the expressions for hybrid $\Pi$ 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                               | CO6  | 6 Marks |
|   |     | $R_{if} = \frac{R_i}{1 + R_i \beta}  .$                                                            |      |         |
|   |     | (OR)                                                                                               |      |         |
| 4 | a)  | State and explain the Barkhausen's criterion for Oscillations.                                     | CO1  | 6 Marks |
|   | b)  | Implement Audio frequency oscillator by using conventional passive                                 | CO6  | 8 Marks |
|   |     | components like R and C and derive its frequency of oscillations.                                  |      |         |
| _ |     | UNIT-III                                                                                           | 0.04 | - > < 1 |
| 5 | a)  | What are the advantages and disadvantages of a transformer coupled Class-A power amplifier?        | COI  | 7 Marks |
|   | b)  | Select a power amplifier to get an efficiency of 25%.explain it.                                   | CO5  | 7 Marks |
| C | `   | (OR)                                                                                               | 005  |         |
| 6 | a)  | amplifiers, compromising with efficiency.                                                          | 005  | / Marks |
|   | b)  | Explain the operation of a Class-A power amplifier and derive the                                  | CO1  | 7 Marks |
|   |     | expression for maximum efficiency.                                                                 |      |         |
| _ |     | UNIT-IV                                                                                            | ~~ . |         |
| 7 | a)  | Evaluate upper 3-dB and Lower 3-dB frequencies for IKHZ Square wave                                | CO4  | 7 Marks |
|   | 1 \ | output from an amplifier with Rise time $t_r=250$ ns and tilt=10%.                                 | 001  | 7 ) ( 1 |
|   | D)  | clamper                                                                                            | COI  | / Marks |
|   |     | (OR)                                                                                               |      |         |
| 8 | a)  | The input voltage of the two level clippers is varying linearly from 0 to                          | CO4  | 7 Marks |
|   |     | 100v. Draw the output waveform and transfer characteristics.                                       |      |         |
|   |     |                                                                                                    |      |         |
|   |     | $100K \downarrow D_2 \end{cases} R_2$                                                              |      |         |
|   |     |                                                                                                    |      |         |

b) Briefly explain about clamping circuit theorem and write its necessary CO1 7 Marks condition.

50V

70\

# UNIT-V

- 9 List the applications of astable multivibrator. a)
  - 7 Marks CO2 Apply appropriate technique to convert voltage to frequency, using two CO5 7 Marks b) transistors.

# (OR)

- Apply appropriate technique to convert any signal to square signal, using CO5 10 8 Marks a) two transistors and deduct necessary expressions.
  - List the applications of Bi-stable multi-vibrator. b) 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

SVEC-16

### 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 $(+5) \times (-3)$ using Booth's Multiplication Process                                                                                                                                                                         | CO1        | 7 Marks             |
|---|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------------|
|   | b)       | Design a 4-bit binary incrementer circuit using four Half-Adder circuits.                                                                                                                                                                                                                          | CO3        | 7 Marks             |
| 2 | a)       | Perform the following arithmetic operations in binary using 2's complement representation. Consider 8-bits for representing binary numbers.<br>i) $6 \pm 13$ ii) $6 \pm 13$ iii) $6 \pm 13$ iv) $6 \pm 13$                                                                                         | 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)<br>b) | Differentiate Hardwired control with Micro-programmed control.<br>Suppose a machine encodes instructions in 32 bits according to the<br>following format. Also, suppose the encoding must accommodate 164<br>op-codes, and 50 registers.                                                           | CO2<br>CO4 | 4 Marks<br>10 Marks |
|   |          | 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?                                                                                                                                                                                                                    |            |                     |
|   |          | (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                                                                                                                                                                                                                               | CO1        | 7 Marks             |
|   |          | initial configuration of an Instruction Cycle.                                                                                                                                                                                                                                                     |            |                     |
|   |          | (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             |
| 6 | a)       | It is necessary to transfer 256 words from a magnetic disk to a memory<br>section starting from address 1230. The transfer is by means of DMA.<br>i) Give the initial values that the CPU must transfer to the<br>DMA Controller.<br>ii) Give the step-by-step account of the actions taken during | CO4        | 7 Marks             |
|   |          | the input of the first 2 words.                                                                                                                                                                                                                                                                    |            |                     |

b) Explain program interrupt and interrupt cycle.

### Compare and contrast various Read Only Memories (ROM). A computer uses RAM chips of 1024 x 1 capacity. 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)

7 Marks

7 Marks

UNIT-IV

- 8 a) Distinguish between synchronous and asynchronous DRAM. CO2 7 Marks
  - b) Consider a machine with a byte addressable main memory of 2<sup>16</sup> bytes CO4, 7 Marks and block size of 8 bytes. Assume that a direct mapped cache consisting CO5 of 32 lines is used with this machine.
    - 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

7

a) b)

- 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<sub>0</sub> and P<sub>1</sub>. Consider memory module with 8 words. CO3 7 Marks Design a Binary Tree Multistage Switching Network to connect processors with memory using 2 x 2 switches.
  - b) A weather forecasting computation requires 250 billion floating-point CO6 7 Marks operations. The problem is processed in a supercomputer that can perform 100 megaflops. How long will it take to do these calculations?

### (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 CO4 7 Marks multiplies two 8-bit binary integers. Each segment consists of a number of AND gates and a binary adder similar to an array multiplier.
    - 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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SVEC-16 Roll No. SREE VIDYANIKETHAN ENGINEERING COLLEGE (An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu) II B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021 **DATA STRUCTURES** [Computer Science and Engineering, Information Technology, **Computer Science and Systems Engineering** Time: 3 hours Max. Marks: 70 **Answer One Question from each Unit** All questions carry equal marks UNIT-I Define Single Linked List. How to create a single linked list and display 1 CO1 14 Marks the list in reverse order? (**OR**) 2 List the advantages of linked list over arrays. CO1 7 Marks a) Define Doubly linked list. With a neat diagram, show how an element is CO1 b) 7 Marks added and removed from front end of the list. UNIT-II Define Stack. Write a procedure to implement stack operations using 3 CO1 10 Marks a) Linked Lists. List the applications of Stack. CO1 4 Marks b) (**OR**) Define queue. Explain the operations of Queue using linked list with 4 a) CO1 9 Marks examples. List the applications of Stack. CO1 5 Marks b) UNIT-III) 5 Give an algorithm for finding maximum element in binary tree. a) CO3 7 Marks Construct binary tree and identify the post-order from given in-order and CO3 7 Marks b) preorder traversals. In-order : D B E A F C Pre-order: A B D E C F (**OR**) 6 In a binary tree, how do you compute the number of leaf nodes? Explain CO3 14 Marks the algorithm with suitable example. (UNIT-IV) 7 Define a graph and write about different types of graphs. CO1 7 Marks a) Explain in detail different ways of representing graphs. b) CO1 7 Marks (**OR**) 8 Describe in detail about depth first traversal of a graph with suitable CO1 14 Marks example. UNIT-V 9 Indicate whether you use an Array, Linked List or Hash Table to store CO6 14 Marks 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.

### (**OR**)

10 Compare the following Open addressing methods. CO2 14 Marks i) Linear Probing. ii) Quadratic Probing. iii) Double Hashing.

Time: 3 hours

Roll No.

### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

### **PYTHON PROGRAMMING**

| [ Computer | Science | and | Engineering | ] |
|------------|---------|-----|-------------|---|
|------------|---------|-----|-------------|---|

Max. Marks: 70

SVEC-16

### 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<br>i) 4+8*2/2**2.<br>ii) 2*3.5+1//2*3/2. | CO2        | 6 Marks            |
| 3  | a)       | Explain while statement in python with example                                                           | $CO^{2}$   | 7 Marka            |
| 5  | a)<br>b) | Write a python script to calculate sum of individual digits of a given<br>number using while.            | CO2<br>CO5 | 7 Marks<br>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                                  | CO5        | 7 Marks            |
|    |          | values to the list and display the same on to the console screen.                                        |            |                    |
|    |          | (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                                | CO3        | 7 Marks            |
|    |          | many lines of text are in the file.                                                                      |            |                    |
| 6  |          | (OR)                                                                                                     | COS        | 14 Martia          |
| 0  |          | by 10 (without keeping the remainder) until the number is less than 10                                   | COS        | 14 Marks           |
|    |          | 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.)                                                                                    |            |                    |
|    |          | (UNIT-IV)                                                                                                |            |                    |
| 7  | a)       | Explain the fundamental features of turtle graphics.                                                     | CO1        | 7 Marks            |
|    | b)       | Explain the fundamental concept of object oriented programming.                                          | COI        | 7 Marks            |
| 0  |          | (OR)                                                                                                     | CO4        | 14 Mortes          |
| 0  |          | Develop a simple program for bouncing ball using multiple turnes.                                        | 004        | 14 Marks           |
| 0  |          |                                                                                                          | 000        | 1434 1             |
| 9  |          | How to reuse a GUI component with class? And explain about Attaching                                     | CO2        | 14 Marks           |
|    |          |                                                                                                          |            |                    |
| 10 |          | Write a python script to develop a window by adding buttons and                                          | CO5        | 14 Marks           |
|    |          |                                                                                                          | ~~~        |                    |

# callbacks using tkinter and explain the procedure.

### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### SENSORS AND TRANSDUCERS

[Electronics and Instrumentation Engineering]

Time: 3 hours

Max. Marks: 70

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

# UNIT-I

1 Define the term 'Units', 'Absolute Units', 'Fundamental Units' and CO6 14 Marks 'Derived Units'. Cite suitable examples to support the need to follow ethical standards for measuring instruments.

### (OR)

2 Differentiate between the deflection and null type of instruments giving CO4 14 Marks suitable examples. Discuss about the selection of a transducer based on their accuracy, sensitivity and suitability for dynamic measurements.

# UNIT-II)

- 3 a) Apply the different standard inputs for studying the dynamic response of a CO2 7 Marks system. Define and sketch them.
  - b) An RC circuit consists of a capacitor of  $1\mu$ F in series with a resistor of CO3 7 Marks 5K $\Omega$ .A dc voltage of 50V is suddenly applied across the circuit. Calculate the value of the voltage after i) 5ms and ii) 25ms.

#### (**OR**)

4 Derive the transfer function of a thermal system when the heat input rate is CO2 14 Marks suddenly increased from its steady conditions. Discuss the assumptions made.

### (UNIT-III)

5 Describe the constructional details of a resistance potential divider and CO1 14 Marks derive the expressions for its output voltage when connected across a meter of finite impedance.

#### (OR)

6 Explain with diagrams, the bonded and unbounded types of strain gauges. CO1 14 Marks For bonded strain gauges, describe the materials used for base, and adhesive materials and also the materials used for leads.

# UNIT-IV

7 Illustrate the process of chemical analysis of liquids in industries which CO5 14 Marks use the principle of electrochemical sensing.

### (OR)

8 Describe the construction, principle of working and applications of Hall CO1 14 Marks Effect transducers.

SVEC-16

# UNIT-V

- 9 a) Explain the principle of working, constructional details and applications of CO1 7 Marks photo transistors.
  - b) A photo-transistor of circuit shown in figure with the characteristics has a CO3 7 Marks supply voltage of 20V and a collector load resistance of  $2K\Omega$ . Determine the output voltage when the illumination level is:
    - i) Zero. ii)  $200 \text{ w/m}^2$  and iii)  $400 \text{ w/m}^2$ .



 10
 Intelligent sensors.

 10
 0

CO1 14 Marks
SVEC-16

### SREE VIDYANIKETHAN ENGINEERING COLLEGE

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(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 CO1 1 Find the truth table for the following: 7 Marks a) iii)  $(p \downarrow q) \land (p \downarrow r)$ . i) (p∨q) ∧ r. ii)  $(\mathbf{p} \vee \mathbf{q}) \Rightarrow \mathbf{r}$ .  $((p \lor q) \land (\neg p \lor \neg q)) \lor q$ . Is a tautology or not? Justify. CO1 7 Marks **b**) (**OR**) 2 Identify and explain the converse, inverse and contra positive of the a) CO3 7 Marks following conditional statement. "If the flood destroy my house or the fires destroy my house, then my insurance company will pay me". Write the Negation of the following statement: CO1 7 Marks b)  $\exists x \in R x > 3 \Rightarrow x^2 > 9$ UNIT-II Determine the value of  $f^{-1}g(x)$  and  $hf(gf^{-1})(hf(x))$  for the functions f, g3 a) CO<sub>4</sub> 6 Marks and  $h: \mathbb{R} \to \mathbb{R}$  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. b) Examine the functions f and g both of which are from  $N \rightarrow N$  to N given CO2 8 Marks by f(x, y) = x + y and g(x, y) = xy are onto but not one-one. (**OR**) 4 Define lattice. Also, illustrate properties of lattices. CO1 6 Marks a) b) Determine that (S, /) is a lattice, where S=(1,2,3,6) and / is for divisibility CO4 8 Marks prove that this is a distributive lattice. (UNIT-III) Examine whether given set 'S,'  $S = \{0,1,2,3,4,5\}$  can be semi group under CO2 5 7 Marks a) binary operation O5 or not? State and prove Lagrange's theorem. CO1 7 Marks b) (**OR**) Define Algebraic structure. List its properties. 6 a) CO1 6 Marks Justify whether the set of positive integers N is a monoid with respect to b) CO5 8 Marks the binary operation \* defined as a\*b=lcm(a,b), for all a,b belongs to N. UNIT-IV 7 In a Survey of 500 Television viewers of a sports channel Produced the CO4 5 Marks a) 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 ? In How many ways can 6 men and 6 women be seated in a row? CO<sub>4</sub> 4 Marks b) (i) if any person may sit next to any other. (ii) if men and women must occupy alternative seats. Identify the Coefficient of  $X^{27}$  in the expansion of  $(X^4+X^5+X^6+----)^5$ . CO3 5 Marks c) (**OR**)

- 8 a) Solve the Recurrence Relation  $U_n+5U_{n-1}+5U_{n-2}=0$ ,  $n \ge 0$ , where the initial CO4 7 Marks conditions are  $U_0=0$  and  $U_1=2\sqrt{5}$ .
  - b) If  $a_n$  is a solution of the recurrence relation  $a_{n+1}=Ka_n$  for  $n \ge 0$  and CO2 7 Marks  $a_3=153/49$  and  $a_5=1377/2401$ , what is K?



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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]

Max. Marks: 70

SVEC-16

### 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                                            | CO2         | 7 Marks  |
|    |          | 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.                                               |             |          |
| (  | -)       | (OR)                                                                                    | <b>CO</b> 2 | 7 Maulas |
| 0  | a)<br>b) | What is Polody's Anomaly? Explain with an axample                                       | $CO_2$      | 7 Marks  |
|    | 0)       |                                                                                         | 02          | / WIAIKS |
| 7  | a)       | Explain with the help of necessary diagrams the file system and directory.              | $CO^{2}$    | 7 Morka  |
| /  | a)       | implementation.                                                                         | COS         | / WIAIKS |
|    | b)       | Compare contiguous and linked allocation methods for disk space.                        | CO4         | 7 Marks  |
|    |          | (OR)                                                                                    |             |          |
| 8  |          | With an illustrative example, distinguish between SSTF, FCFS, SCAN,                     | CO1         | 14 Marks |
|    |          | C-SCAN, LOOK, C-LOOK disk scheduling algorithms.                                        |             |          |
|    |          | 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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## II B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

## JAVA PROGRAMMING

[Computer Science and Systems Engineering]

Max. Marks: 70

SVEC-16

### 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      | CO1      | 5 Marks   |
|   |            | of defining goto statement behavior in Java?                                |          |           |
|   | c)         | Explain in detail about constructor overloading with an example.            | CO1      | 5 Marks   |
|   |            | UNIT-II)                                                                    |          |           |
| 3 | a)         | Create an abstract class <i>Accounts</i> with the following details:        | CO6      | 7 Marks   |
|   |            | 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:                                                               |          |           |
|   |            | 1) overdraftLimit                                                           |          |           |
|   |            |                                                                             |          |           |
|   |            | 1) display() to show overdraft limit along with the full                    |          |           |
|   |            | account holder details                                                      |          |           |
|   |            | Create objects of these two classes and call their methods. Use appropriate |          |           |
|   | <b>b</b> ) | Constructors.                                                               | $CO^{2}$ | 7 Mortra  |
|   | 0)         | (OP)                                                                        | COS      | / WIAIKS  |
| 1 | а)         | (UN)<br>How can we access an interface from another interface?              | CO1      | 7 Marka   |
| + | aj<br>b)   | What is a package? Explain it with an example and also write how to         | CO1      | 7 Marks   |
|   | U)         | import packages                                                             | COI      | / IVIALKS |
|   |            | mport packages.                                                             |          |           |

|    |     | (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<br>runnable interface to create the threads. Make sure that the main thread<br>always executs last.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | CO3 | 7 Marks  |
|    |     | (OR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |          |
| 6  | a)  | Create a user-defined exception named checkArgument to check the<br>number of arguments passed through command line. If the number of<br>arguments is less than five, throw the checkArgument exception, else<br>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<br>Add four labels with Text only, image only, image and text with text<br>displayed at top center, image only at right position. Add four buttons to<br>the Applet - Buttonl with text "Try Me", Button2 with text in the right<br>position. Button3 with the corn image and text in the left position and<br>Button4 with grapes image. Whenever a button is clicked, display a<br>message about the selection in a text field. Make this text field non-<br>editable, so that user cannot change its content. Add keyboard mnemonic<br>to button 3 so that the button can be selected by pressing Alt + C in the<br>keyboard. Add a tooltip to button4, so that it will be displayed when<br>mouse hovers over the button. | CO5 | 14 Marks |
| 8  |     | Design a java program to perform the following using linked list.<br>i) Remove a node form the list.<br>ii) Insert a node at the end of the list.<br>iii) Insert a node anywhere in the existing list.<br>iv) Remove a node anywhere in the existing list.<br><b>UNIT-V</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | CO3 | 14 Marks |
| 9  | a)  | What are servlets? What are the three methods that are central to the life                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | CO1 | 7 Marks  |
|    |     | cycle of a servlet?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 96. |          |
|    | b)  | Design a servlet which displays current system date and time.<br>(OR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | CO3 | 7 Marks  |
| 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  |

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## 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 hoursMax. Marks: 70Maxer One Question from each Unit  
All questions carry equal marksUNIT-11a)Define continuous random variable and probability density function.  
If the probability density function of a random variable is given by  
$$F(x) = x \quad for  $0 \le x \le 1$   
 $= 2 - x$  for  $1 \le x \le 2$   
 $= 0$  elsewhereCO44 MarksC0410 MarksFind the probabilities that this random variable will take on value  
i) Between 0.2 and 0.8 ii) Between 0.6 and 1.2  
iii) Greater than 1.8 iv) Between 0.6 and 1.2  
iii) Greater than 1.8 iv) Between 0.4 and 1.6.CO47 Marks $f(x) = kxe^{-4x^2} forx < 0$   
 $= 0$  $for x \le 0$ CO47 Marks $f(x) = kxe^{-4x^2} forx < 0$   
 $= 0$  $for x \le 0$ CO47 Marksi) Find k  
ii) Evaluate P(X < 6), P(X  $\ge 6$ ), P(3  $\le X \ge 6$ )  
**UNT -11**CO47 MarksOut3a)The sum and product of the mean and table.CO47 Marksi) Find k  
ii) Evaluate P(X < 6), P(X  $\ge 6$ ), P(3  $\le X \ge 6$ )  
**UNT -11**CO47 MarksCO47A a the sum and product of the marks obtained by 1000 students  
in an examination are respectively 34.4 and 16.5.NoCO47 MarksOROROROUT of the memory chips made in a certain injection is 0.001,  
of the distribution, find the approximate number of students expected to  
obtain marks between 30 and 60.<$$

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| 6  | a)         | Find the regression lines to the given data.                               | CO1      | 7 Marks        |
|----|------------|----------------------------------------------------------------------------|----------|----------------|
| U  | u)         | $\begin{array}{c c c c c c c c c c c c c c c c c c c $                     | CO2      | , intuitio     |
|    |            | Y 33 38 50 39 52 47 35 43 41                                               |          |                |
|    | b)         | Find the rank correlation coefficient to the given data:                   | CO1.     | 7 Marks        |
|    | /          | X 68 64 75 50 64 80 75 40 55 64                                            | CO2      |                |
|    |            | 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         | CO1,     | 7 Marks        |
|    | ,          | deviation of the number of acceptable pieces produced by automatic         | CO4      |                |
|    |            | stamping machine are 1038 and 146 respectively. Does this enable us to     |          |                |
|    |            | reject the null hypothesis $\mu$ =1000 ? Justify your answer.              |          |                |
|    | b)         | A manufacturer of bulbs claims that only 2% of his bulbs are defective. A  | CO2      | 7 Marks        |
|    |            | 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.                                 |          |                |
| 0  | `          | (OR)                                                                       | 001      | <b>5</b> ) ( 1 |
| 8  | a)         | The means of two large samples of sizes 1000 and 2000 are 67.5 and 68      | COI,     | 7 Marks        |
|    |            | respectively. Lest the equality of means of the two populations each with  | CO4      |                |
|    | <b>b</b> ) | A machine put out 16 important articles in a sample of 500. After the      | $CO^{2}$ | 7 Morka        |
|    | 0)         | A machine put out 10 imperfect articles in a sample of 500. After the      | 002      | / WIAIKS       |
|    |            | Has the machine improved or not? Justify your answer                       |          |                |
|    |            |                                                                            |          |                |
| 0  | a)         | The mean weight loss of $n=16$ grinding halls after certain length of time | CO4      | 7 Marks        |
| 9  | <i>a)</i>  | in a mill slurry is 34.2 grams with a standard deviation of 0.68 grams     | 004      | / WIAIKS       |
|    |            | Construct a 99% confidence interval for the true mean loss of such         |          |                |
|    |            | orinding halls                                                             |          |                |
|    | b)         | The following random samples are measurements of heat producing            | CO4      | 7 Marks        |
|    | 0)         | capacity in millions of calories per ton of specimens of coal from two     | 001      | ,              |
|    |            | mines. Use 0.01 level of significance to test, whether the difference      |          |                |
|    |            | between the means of these two samples is significant?                     |          |                |
|    |            | 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  | CO4      | 14 Marks       |
|    |            | Economic conditions. Test whether intelligence is independent of           |          |                |
|    |            | Economic condition at 1% level of significance.                            |          |                |

| Economic  | Intelligence |      |          |      |
|-----------|--------------|------|----------|------|
| condition | Excellent    | Good | Mediocre | Dull |
| Good      | 48           | 199  | 181      | 82   |
| Not good  | 81           | 185  | 190      | 106  |

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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

#### **SPECIAL FUNCTIONS AND COMPLEX ANALYSIS**

[Electrical and Electronics Engineering, Electronics and Communication Engineering,

### **Electronics and Instrumentation Engineering**]

Answer One Question from each Unit All questions carry equal marks

CO4

7 Marks

Max. Marks: 70

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## UNIT-I

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)

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  $J_1(x)$ .

### (UNIT-II)

3 Define continuity of f(z) at origin. Prove that the function defined by CO1 14 Marks  $f(z) = \frac{x^{3}(1+i) - y^{3}(1-i)}{x^{2} + y^{2}}(z \neq 0), f(0) = 0 \text{ is continuous and the Cauchy}$ 

Riemann equations are satisfied at the origin yet f'(0) does not exist.

(**OR**)

4 a) Show that polar form of Cauchy Riemann equations are CO1 7 Marks  $\frac{\partial u}{\partial r} = \frac{1}{r} \frac{\partial v}{\partial \theta}, \quad \frac{\partial v}{\partial r} = -\frac{1}{r} \frac{\partial u}{\partial \theta}.$ Hence deduce that  $\frac{\partial^2 u}{\partial r^2} + \frac{1}{r} \frac{\partial u}{\partial r} + \frac{1}{r^2} \frac{\partial^2 u}{\partial \theta^2} = 0.$ b) If f(z) is ananalytic function of z, Prove that  $\left(\frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2}\right) |Rf(z)|^2 = 2 |f'(z)|^2.$ CO2 7 Marks

## UNIT-III)

5 a) State and prove Cauchy's Integral formula. b) Construct a series of positive and negative powers of (z+1) for the CO3 7 Marks  $f(z) = \frac{7z-2}{(z+1)z(z-2)}$ 

- 6 a) Evaluate  $\oint_C \frac{\log z}{(z-1)^3} dz$  where C is  $|z-1| = \frac{1}{2}$  using Cauchy's integral  $\underset{CO4}{CO4}$  7 Marks formula.
  - b) Construct Laurent's series about z = 1 for  $f(z) = \frac{e^{2z}}{(z-1)^3}$ . Analyze the CO2 7 Marks series and identify the region of convergence

## (UNIT-IV)

Define the singularity of a function. Determine the poles of the function CO1 7 14 Marks  $f(z) = \frac{z^3}{(z-1)^4(z-2)(z-3)}$  and the residue at each pole, Hence evaluate CO4  $\oint_C f(z)dz$ , where C is the circle |z| = 2.5. (OR) Evaluate  $\int_{-\infty}^{\infty} \frac{x^2}{(x^2+1)(x^2+4)} dx$  by complex variable technique. 8 CO5 14 Marks UNIT-V 9 Find the bilinear transformation which maps the points z = 1. i, -1 onto CO1 14 Marks CO4 the points w = i, 0, -i. Hence find (a) the image of |z| < 1, (b) the invariant points of this transformation.

- 10 Discuss the transformation  $w = e^z$ . CO3 14 Marks CO4
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### SREE VIDYANIKETHAN ENGINEERING COLLEGE

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

MANAGERIAL ECONOMICS AND PRINCIPLES OF ACCOUNTANCY

[ Civil Engineering ]

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 CO1 14 Marks decision making process.

(OR)

2 What is Law of Demand? State and explain the Law of Diminishing CO1 14 Marks returns.

## UNIT-II

3 What are the three stages of short run production function? Why does it CO2 14 Marks not make any economic sense to produce in stage 1 or stage 2?

### (OR)

CO2 14 Marks

4 Differentiate between:

- i) Explicit Cost Vs Implicit Cost.
- ii) Fixed Cost *Vs* Variable Cost.
- iii) Marginal Cost Vs Average Cost.

## UNIT-III)

5 Explain the various features of a Perfect Competitive Market. How is CO1 14 Marks Price of a commodity determined under it?

### (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 CO1 14 Marks any two accounting concepts in detail.

### (OR)

- 8 Write journal entries for the following transactions in the books of CO2 14 Marks 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.

## UNIT-V

9 Explain the distinction between Manual Accounting and Computerized CO1 14 Marks Accounting. Elaborate the advantages and disadvantages of Computerized Accounting.

10 From the following trail balance of Bikram, prepare Trading and Profit & CO2 14 Marks Loss Account for the year ending 31<sup>st</sup> March 2016 and the Balance Sheet as on that date.

| 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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### 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 Explain the stages of planning by different agencies. 7 Marks 1 CO1 a) List out the salient features of workmen's compensation act of 1923. b) CO8 7 Marks (**OR**) 2 a) Describe the labour legislation in India. CO8 7 Marks What are the basic concepts in the development of construction plans? b) CO1 7 Marks UNIT-II) 3 Write down the ABC classification of materials. CO9 7 Marks a) b) Differentiate resource smoothing and resource leveling. CO9 7 Marks (**OR**) 4 a) Explain about: CO5 7 Marks i) Concreting plant and equipment. ii) Earth compaction equipment. iii) Hoisting equipment. Write a brief note on operation and maintenance of equipment. CO5 7 Marks b) UNIT-III) 5 What is bar chart and what are its shortcomings? CO5 7 Marks a) What is project management? What are the main causes of project failure? b) CO1 7 Marks (**OR**) 6 Discuss the methods of scheduling bringing out their importance in CO1 a) 7 Marks projects. Describe various phases of project management. CO1 7 Marks b) UNIT-IV) What are the different types of networks? Write the advantages of network 7 CO1 7 Marks a) techniques over conventional techniques. The following information applies to particular project. The expected CO3 b) 7 Marks times are given below. 0-1 1-3 2-3 Activity: 1-2 1-4 3-4 4-5 Duration: 3 16 6 8 10 5 3 Draw the network diagram and locate critical path. (**OR**) What is dummy? How and where should a dummy be used? 6 Marks 8 a) CO1 Illustrate Hierarchies in the development of network with an example. CO<sub>4</sub> 8 Marks b) UNIT-V 9 How do you evaluate the probability of completion time for a project? CO4 7 Marks a) What do you mean by CPM? What are the time estimates used in CPM CO3 7 Marks b) and explain their significance?

(OR)

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10 a) Determine the Critical path for the network given below.

CO2 7 Marks



b) Define "optimistic time estimate", "pessimistic time" and "most likely CO2 7 Marks time estimate".

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

FLUID MECHANICS AND HYDRAULIC MACHINERY

### [ Civil Engineering ]

Max. Marks: 70

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

| <u> </u> |       |   |
|----------|-------|---|
| (        | NTT-T | ) |
|          |       |   |

| 1 | a)       | Define the following terms.                                                                                                                                                                                                                                                                                                                                                                                | CO1        | 6 Marks            |
|---|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|
|   | b)       | A vertical cylinder of diameter 200mm rotates concentrically inside<br>another cylinder of diameter 202mm. Both the cylinders are 250mm high.<br>The space between the cylinders is filled with a liquid whose viscosity is<br>unknown. Determine the viscosity of the fluid if a torque of 25N-m is<br>required to rotate the inner cylinder at 150 r.p.m.<br>(OR)                                        | CO2        | 8 Marks            |
| 2 | a)<br>b) | What is hydrostatic law? Differentiate gauge and absolute pressures.<br>A circular plane plate of diameter 3m lies in water in such a way that the plane makes an angel of 30 <sup>°</sup> with the free water surface. Determine the total pressure and center of pressure when the upper edge is 2m below the free water surface.                                                                        | CO1<br>CO2 | 6 Marks<br>8 Marks |
| 3 | a)       | Derive the continuity equation in differential form for three dimensional                                                                                                                                                                                                                                                                                                                                  | CO1        | 7 Marks            |
|   | b)       | fluid flows.<br>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 $100$ kN/m <sup>2</sup> and $60$ kN/m <sup>2</sup> respectively and discharge is 300 litres/sec., determine the loss of head between the two sections and direction of flow. | CO2        | 7 Marks            |
| Λ | a)       | (OR)                                                                                                                                                                                                                                                                                                                                                                                                       | CO1        | 6 Mortra           |
| 4 | a)       | i) Stream line ii) Path line                                                                                                                                                                                                                                                                                                                                                                               | COI        | 0 IVIAIKS          |
|   | b)       | A swimming pool 12m long and 7m wide holds water to a depth of 2m. If<br>the water is discharged through an opening of area $0.2m^2$ at the bottom of<br>the pool, find the time required to empty the tank. Take coefficient of<br>discharge for the opening as 0.6.                                                                                                                                      | CO5        | 8 Marks            |
|   |          | UNIT-III)                                                                                                                                                                                                                                                                                                                                                                                                  |            |                    |
| 5 | a)       | Explain briefly:<br>i) Hydraulic gradient line.<br>ii) Total energy line.<br>iii) Moody's chart.                                                                                                                                                                                                                                                                                                           | CO1        | 6 Marks            |
|   | b)       | Two reservoirs have difference of water levels of 6m. They are connected<br>by pipe system which consists of a single pipe of 600mm diameter for the<br>first 3000m and then two pipes in parallel, each of 300mm diameter and<br>3000m in length. Calculate the rate of flow. Assume friction factor as 0.04<br>for all pipes.                                                                            | CO2        | 8 Marks            |
|   |          | (ON)                                                                                                                                                                                                                                                                                                                                                                                                       |            |                    |

Time: 3 hours

| 6  | a)  | State Buckingham's $\pi$ theorem and explain the method for dimensional                           | CO1 | 8 Marks       |
|----|-----|---------------------------------------------------------------------------------------------------|-----|---------------|
|    | h)  | In 1.30 model of a spillway, the velocity and discharge are 1.5m/s and                            | CO4 | 6 Marks       |
|    | 0)  | $2 \text{ 0m}^3$ /s. Find the corresponding velocity and discharge in the prototype               | 004 | 0 WILLING     |
|    |     | 2.011 73. 1 hid the corresponding velocity and discharge in the prototype.                        |     |               |
| 7  | 2)  | What is an arific an array? Derive the automations for aritical valuatity and                     | CO1 | 7 Marila      |
| /  | a)  | critical depth in a rectangular channel                                                           | COI | / Warks       |
|    | b)  | A sluice gate discharges water into horizontal rectangular channel with a                         | CO2 | 7 Marks       |
|    | -)  | velocity of 10m/s and depth of flow of 1m. Determine the post jump depth                          |     |               |
|    |     | and loss of head in the jump.                                                                     |     |               |
|    |     | (OR)                                                                                              |     |               |
| 8  | a)  | Derive the dynamic equation of gradually varied flow.                                             | CO1 | 7 Marks       |
|    | b)  | A 6m wide rectangular channel conveys 14m <sup>3</sup> /s of water at a depth of 1.2m. Calculate: | CO1 | 7 Marks       |
|    |     | i) Specific energy of the flowing fluid.                                                          |     |               |
|    |     | ii) Critical depth, critical velocity and minimum specific energy.                                |     |               |
|    |     | UNIT-V                                                                                            |     |               |
| 9  | a)  | Explain the following:                                                                            | CO1 | 6 Marks       |
|    |     | i) Specific speed of a turbine.                                                                   |     |               |
|    |     | 1) Net positive suction head of a centrifugal pump.                                               |     |               |
|    | 1-) | 111) Governing of turbine.                                                                        | COL | 0 Maulaa      |
|    | D)  | Design a Francis turbine runner with the following data:                                          | 003 | 8 Marks       |
|    |     | Speed of the runner : 750 r.n.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.                                                                                          |     |               |
| 10 | 2)  | (OR)                                                                                              | CO1 | ( Manlar      |
| 10 | a)  | i) Functions of a draft tube                                                                      | COI | o Marks       |
|    |     | i) Performance characteristic curves of a turbine                                                 |     |               |
|    | b)  | A three stage centrifugal pump has impellers 400mm in diameter and                                | CO2 | 8 Marks       |
|    | 0)  | 20mm wide at outlet. The vanes are curved back at the outlet at 45° and                           | 002 | 0 10 10 10 10 |
|    |     | 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 <sup>3</sup> /s. Determine the head generated by the pump and                |     |               |
|    |     | shaft power required to run the pump.                                                             |     |               |
|    |     | \$\$ \$\$ \$\$                                                                                    |     |               |

(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

A member ABCD is subjected to point loads P1, P2, P3 and P4 as shown CO1 14 Marks 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 x 10<sup>5</sup>N/mm<sup>2</sup>



### (OR)

A circular rod of 90mm diameter and 450mm long is subjected to a tensile CO1 14 Marks force of 800kN. Determine the modulus of rigidity, bulk modulus and change in volume if Poisson's ratio = 0.3 and young modulus is  $E = 2.1 \times 10^5 \text{N/mm}^2$ .

## UNIT-II

A beam AB 5m long is simply supported at A and B. it is loaded with CO2 14 Marks 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.

### (OR)

- 4 a) Explain the relation between bending moment and shear force.b) A simply supported beam of span L is loaded with distributed load of CO2 8 Marks
  - intensity zero at the ends and w per unit length at the centre. Plot the shear force and bending moment diagrams.

## (UNIT-III)

5 Derive the basic bending equation for a beam of elastic material. State CO2 14 Marks clearly the assumptions made in simple theory of bending.

### (OR)

6 A beam of triangular cross-section with base **b** and height **h**, is used with CO2 14 Marks the base horizontal. Calculate the intensity of maximum shear stress and plot the variation of shear stress intensity along the section.

## UNIT-IV

7 State the assumptions and derive the torsion equation for a solid shaft CO3 14 Marks subjected to a torque T.

### (OR)

8 In a hollow circular shaft of outer and inner diameters of 20cm and 10cm CO3 14 Marks respectively, the shear stress is not to exceed 40N/mm<sup>2</sup>. Find the maximum torque which the shaft can safely transmit.

## UNIT-V

9 Find the ratio of thickness to internal diameter for a table subjected to CO5 14 Marks internal pressure, when the pressure is  $5/8^{\text{th}}$  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<sup>2</sup>. Take E = 2 x 105N/mm<sup>2</sup> and Poisson's ratio = 0.286.

### (OR)

10 A cylindrical vessel whose ends are closed by means of rigid plane plates CO4 14 Marks 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.

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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 ]

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 CO1 14 Marks cross staff and give a field usage description of optical square and cross staff. (OR)
- A 20-m tape was tested before starting the day's work and found to be CO4 14 Marks 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.

## UNIT-II

- 3 Explain two-point problem and the method of solution for plane table CO2 14 Marks surveying and also explain the likely errors that may occur in plane table surveying.
- 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 CO2 14 Marks angles between two-point with the help of neat sketch.

#### (OR)

6 Derive the formula for distance and elevation in the tangential method CO4 14 Marks with the help of neat sketch and explain the principle of stadia method.

## UNIT-IV)

A chain line was divided into eight sections of 12m each. Offsets were CO2 14 Marks 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.

### (OR)

8 Derive the expressions for the elements of compound curve and vertical CO4 14 Marks curve with neat sketches.

## UNIT-V

9 Briefly explain the fundamental quantities measured by total station. How CO5 14 Marks they can be used to find the level and coordinates of observed station.

### (**OR**)

10 Discuss briefly the preparations required for measurement with total CO6 14 Marks station and list various input data to be given for distance measurement with total station.

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

### **DC MACHINES**

[Electrical and Electronics Engineering]

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 CO1 6 Marks suitable diagrams.
  - b) A 4-pole DC shunt generator with shunt field resistance of  $100\Omega$  and CO4 8 Marks armature resistance of  $1\Omega$  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.

### (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. CO4 8 Marks Its armature and shunt field resistance are 0.5Ω and 125Ω respectively.

Calculate the efficiency at rated load.

## (UNIT-II)

- 3 a) Develop an expression for the demagnetizing and cross magnetizing CO2 7 Marks armature ampere-turns in a DC generator.
  - b) A 4-pole DC generator has an output of 120A at 400V, the wave CO4 7 Marks connected armature has 980 conductors. The brushes are advanced by 3 degrees from the neutral axis. Find (*i*) ATd /pole, (*ii*) ATc/pole.

#### (**OR**)

- 4 a) With neat diagrams, describe the phenomenon of armature reaction in a CO1 7 Marks dc machine. Discuss its effects.
  - b) What is meant by reactance voltage and derive expression for reactance CO2 7 Marks voltage.

## UNIT-III)

- 5 a) Describe critical speed and critical resistance of a DC shunt generator and CO1 7 Marks explain how to obtain these from the OCC curve.
  - b) Two shunt generators operating in parallel given a total output of 600A. CO4 7 Marks One machine has an armature resistance of  $0.2\Omega$  and a generator voltage of 455V and the other an armature resistance of  $0.025\Omega$  and a generated voltage of 460V. Calculate the terminal voltage and the Kilowatt output of each machine. Neglect field currents.

- 6 a) Describe the parallel operation of two DC shunt generators. Why the CO1 6 Marks generators with drooping characteristics are best suited?
  - b) A DC series generator having external characteristics which is a straight CO4 8 Marks line through zero to 50V at 200A is connected as a booster between a station bus bar and a seeder of  $0.3\Omega$  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.

## UNIT-IV

Derive the Torque Equation of DC motor. 7 CO<sub>2</sub> 6 Marks a) A 6-pole DC shunt motor has a wave-connected armature with 87 slots, CO4 8 Marks b) each slot containing six conductors. The flux per pole is 30mWb and the armature has a resistance of  $0.10\Omega$ . Calculate the speed when the motor is connected to a 250 V supply and taking an armature current of 80 A. **(OR)** 8 Draw and describe the mechanical characteristics of DC series and shunt CO1 6 Marks a) motor A 230V, DC shunt motor, takes an armature current at 3.33A at rated CO4 8 Marks b) voltage and at a no load speed of 1000 r.p.m. The resistances of the armature circuit and field circuit are  $0.3\Omega$  and  $160\Omega$  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%. UNIT-V 9 Describe Field Test for obtaining the efficiency of two similar DC series CO1 6 Marks a) machines. In a retardation test on a DC motor with its field normally excited, the 8 Marks b) CO4 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  $m^2$ . (**OR**) 10 List the merits and demerits of Swinburne's test CO1 4 Marks a) The HOPKINSON'S test on two similar shunt machines give the CO4 10 Marks b) 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  $0.035\Omega$ . Calculate the efficiency of each

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machine assuming a brush contact drop of 1 volt per brush.

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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 CO1 5 Marks between them.
  - b) A 2µC point charge is located at A(4,3,5) in free space. Find  $E_{\rho}$ ,  $E_{\phi}$  and CO3 5 Marks  $E_z$  at P(8,12,2).
  - c) Calculate the work done in moving a 4C charge from B (1, 0, 0) to CO3 4 Marks A(0, 2, 0) along the path y=2-2x, z=0 in the field E= :
    - (i)  $5 a_x V/m$ . (ii)  $5x a_x V/m$ .

#### (OR)

2 a) A circular disk of radius 'a' is uniformly charged with  $\sigma C/m^2$ . The CO2 10 Marks disk lies on the z=0 plane with its axis along the z-axis.

i) Show that at point (0,0,h), 
$$\vec{E} = \frac{\sigma}{2\varepsilon} \left\{ 1 - \frac{h}{[h^2 + a^2]^{1/2}} \right\} \vec{a}_z$$
.

ii) From this, derive the  $\vec{E}$  field due to an infinite sheet of charge on the z=0 plane.

### (UNIT-II)

3 a) Derive the expression for energy density in a static electric field. CO1 4 Marksb) Show that the tangential components are equal at the dielectric-dielectric CO4 10 Marks

interface. Also explore the analysis to derive relation between tangential components for insulated conductor.

#### (OR)

- 4 a) Derive the expression for electric field and potential for the dipole. CO1 7 Marksb) Apply solution of Laplace's equation to derive the expression for CO4 7 Marks
  - capacitance of a coaxial cable.

## (UNIT-III)

- 5 a) Derive expression for H at any point in cylindrical system due to a CO5 6 Marks filamentary conductor carrying a current I on z axis from -∞ < z <∞.</li>
  b) Define magnetic field intensity and magnetic flux density. Give the CO2 5 Marks
  - relation between them. 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 CO3 8 Marks centre of a circular coil of area  $100cm^2$  and carrying a current of 50A.
  - b) Derive  $\nabla X H = J$ . Justify this equation is valid for static magnetic fields. CO4 6 Marks
- 7 a) Derive the expression for force and Torque on a closed loop carrying CO5 7 Marks current in the magnetic field.
  - b) Derive the expressions for statically induced and dynamically induced CO4 7 Marks EMF in case of electromagnetic fields

| 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,                                                                                                      | CO4 | 8 Marks |
|    |    | identify the changes in magnetic field parameters between the dielectrics.                                                                                                    |     |         |
|    |    |                                                                                                                                                                               |     |         |
| 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 <sup>2</sup> and plate separation of                                                                                       | CO3 | 6 Marks |
|    |    | 6mm has a voltage $50\sin(10^3 t)$ volts required to its plates. Determine the                                                                                                |     |         |
|    |    | displacement current, assuming $\mathbf{\epsilon} = 2 \mathbf{\epsilon}_0$                                                                                                    |     |         |

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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 |
|---------------|----|-----------------------------------------------------------------------------------------------|------|-----------|
|               |    | <b>Answer One Question from each Unit</b>                                                     |      |           |
|               |    | 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                                     | CO2  | 7 Marks   |
|               |    | dy(t) / dt + 3ty(t) = t2 x(t) and $y(n) = 2x(n) + 1 / x(n-1)$ .                               |      |           |
|               |    | (OR)                                                                                          |      |           |
| 2             | a) | Find the impulse response of causal LTI systems described by the                              | CO4  | 7 Marks   |
|               |    | following differential equation.                                                              |      |           |
|               |    | $d^{2}y(t) = 5 d^{2}y(t) = 6 y(t) = d^{3}x(t) = 2 d^{2}x(t) = 2 r(t)$                         |      |           |
|               |    | $\frac{dt^2}{dt^2} + 3\frac{dt}{dt} + 6y(t) - \frac{dt^3}{dt^3} + 2\frac{dt^2}{dt^2} + 3x(t)$ |      |           |
|               | b) | Distinguish between the following.                                                            | CO2  | 7 Marks   |
|               |    | i. Continuous time signal and discrete time signal.                                           |      |           |
|               |    | ii. Unit step and Unit Ramp functions.                                                        |      |           |
|               |    | iii. Periodic and Aperiodic Signals.                                                          |      |           |
|               |    | UNIT-II                                                                                       |      |           |
| 3             | a) | Find the Laplace Transform and ROC of the signal                                              | CO2  | 7 Marks   |
|               |    | (t) = e - a(t) + e - btu(t)                                                                   |      |           |
|               | b) | Distinguish between Fourier series Analysis and Fourier Transforms.                           | CO2  | 7 Marks   |
|               | `  |                                                                                               | 005  |           |
| 4             | a) | Determine the Fourier Transform for double exponential pulse whose                            | 005  | / Marks   |
|               |    | function is given by $(t) = e - 2 t $ . Also draw its magnitude and phase                     |      |           |
|               | b) | spectra. Determine the initial value and final value of signal $\mathbf{x}(t)$ whose I aplace | CO5  | 7 Marks   |
|               | 0) | Determine the initial value and initial value of signal $x(t)$ whose Laplace $2s + 5$         | 005  |           |
|               |    | Transform is, $X(s) = \frac{2s+3}{s(s+2)}$ .                                                  |      |           |
|               |    | S(S+3)                                                                                        |      |           |
|               |    | (UNIT-III)                                                                                    |      |           |
| 5             | a) | The switch has been in position a for long time $At t = 0$ it moves to                        | CO5  | 7 Marks   |
|               |    | position b. Calculate $I(t)$ for $t > 0$ .                                                    |      |           |
|               |    |                                                                                               |      |           |
|               |    |                                                                                               |      |           |
|               |    |                                                                                               |      |           |



b) Derive the expression for the transient response of series R-L-C circuit CO2 7 Marks driven by sinusoidal forcing function.

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



b) Derive the expressions for natural and transient response of a series RL CO2 7 Marks circuit excited by a DC voltage source and plot the responses as a function of line.



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 CO1 7 Marks networks.
- (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
- 9 a) Explain in detail constant K- Low pass filter and constant K- High pass CO2 7 Marks filter.
  - b) Design m- derived LPF with a cut off frequency of 2K Hz and frequency CO3 7 Marks of attenuation 2100Hz. Give design impedance is 400Ω.

(OR)

10 a) Explain in detail m-derived T – Section and m-derived  $\pi$  – Section filter. CO1 7 Marks b) Design a constant K HPF for a cutoff frequency of 2KHz. Given CO3 7 Marks  $R_0 = 500\Omega$ .

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#### II B.Tech I Semester (SVEC16) Supplementary Examinations February – 2021

#### **ELECTRICAL TECHNOLOGY**

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

Time: 3 hours

is 4%.

Max. Marks: 70

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

## UNIT-I

1 Derive EMF equation of a DC generator. CO<sub>2</sub> 7 Marks a) A 1500KW, 550V, 16 pole separately excited DC generator runs at CO4 7 Marks b) 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. (**OR**) 2 Explain how a Swinburne's test is conducted on DC shunt machine. CO5 7 Marks a) A 240 V, 4 pole wave connected shunt motor gives 1119 KW when CO4 7 Marks b) running at 1000 r.p.m and drawing an armature current of 50A. The shunt field resistance is  $240\Omega$ . The armature has 540 conductors. Armature resistance is  $0.1\Omega$ . Find i) Gross torque. ii) Shaft torque iii)Useful flux/pole. Take total brush voltage drop as 2V. UNIT-II Explain the working of single phase transformer with the help of a phasor 3 CO1 7 Marks a) diagram. A single phase working at unity pf has an efficiency of 90% at both half-7 Marks b) CO4 full load and full load of 1 KW. Calculate its efficiency at 70% of full load. (**OR**) Discuss with neat sketch the equivalent circuit of transformer on load. 7 Marks 4 CO<sub>2</sub> a) The primary and secondary windings of 40KVA, 6600/250V single phase 7 Marks CO4 b) transformer have resistances of  $10\Omega$  and  $0.02\Omega$  respectively. Total leakage reactance of  $35\Omega$  referred to primary winding. Find full load regulation of power factor of 0.8 lag. UNIT-III) 5 Derive relationship between voltages and currents in 3-phase star CO<sub>2</sub> 7 Marks a) connected system. b) Three coils of resistance  $4\Omega$  and reactance  $3\Omega$  are connected in delta CO4 7 Marks across 400V, 50Hz supply. Find the current in each phase, line current in each phase, line current, real power and reactive power. **(OR)** With the help of a circuit and phasor diagrams, show that the total power 6 7 Marks a) CO2 in a 3 phase, 3-wire star connected balanced load can be measured with the help of one wattmeter. Discuss the advantages of a poly phase system. CO1 7 Marks b) UNIT-IV) 7 Derive an expression for the torque of an induction motor and obtain the CO2 7 Marks a) condition for maximum torque. A 3 phase induction motor has 2 poles and is connected to 400V, 50Hz 7 Marks CO4 b) supply. Calculate the actual rotor speed and rotor frequency when the slip

| 8  | a)<br>b) | Derive the EMF equation of an alternator<br>A 3 phase 10KVA, 400V, 50Hz alternator has per phase armature<br>resistance and synchronous reactance of $0.5\Omega$ and $2.5\Omega$ respectively.<br>Calculate generated emf corresponding to full load at unity power factor. | CO2<br>CO4 | 7 Marks<br>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            |

10 a)Why a single phase induction motor is not self starting.CO27 Marksb)Explain about the constructional details of shaded pole motor.CO17 Marks

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## 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<br>All questions carry equal marks                                                            |                |                     |
|               |          |                                                                                                                                  |                |                     |
| 1             | a)<br>b) | Explain L-D process.<br>Explain the advantages of Vacuum Melting and give the description of any one such furnace.               | CO1<br>CO2     | 5 Marks<br>9 Marks  |
| 2             |          | (OR)<br>Explain Cupola furnace with neat sketch and indicate zones in it.                                                        | CO1            | 14 Marks            |
|               |          | (UNIT-II)                                                                                                                        |                |                     |
| 3             | a)<br>b) | Discuss the allotropy of Iron.<br>Explains Iron–Carbon equilibrium diagram with a neat sketch.                                   | CO4<br>CO4     | 4 Marks<br>10 Marks |
| 4             | a)<br>b) | What is Gibbs phase rule? Explain with an example.<br>Explain Lever rule with an example.                                        | CO4<br>CO4     | 6 Marks<br>8 Marks  |
|               |          | (UNIT-III)                                                                                                                       |                |                     |
| 5             | a)<br>b) | What is the purpose of Heat Treatment?<br>Write the differences between Annealing and Normalizing.                               | CO3<br>CO3     | 5 Marks<br>9 Marks  |
| 6             |          | ( <b>OR</b> )<br>Explain TTT diagram and discuss Bainite Transformation.                                                         | CO3            | 14 Marks            |
|               |          | (UNIT-IV)                                                                                                                        |                |                     |
| 7             |          | Explain:<br>i) Carburizing. ii) Nitriding. iii) Cyaniding.                                                                       | CO3            | 14 Marks            |
| 8             |          | Explain the TEM with a neat sketch.                                                                                              | CO5            | 14 Marks            |
|               |          | UNIT-V                                                                                                                           |                |                     |
| 9             |          | Explain the Production powders with neat sketches.                                                                               | CO6            | 14 Marks            |
| 10            |          | What is Powder Metallurgy? Explain the process with a diagram.<br>Mention the advantages of Powder Metallurgy over Stir Casting. | CO6            | 14 Marks            |

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

#### **KINEMATICS OF MACHINERY**

[ Mechanical Engineering ]

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 | CO1 | 7 Marks |
|---|----|--------------------------------------------------------------------|-----|---------|
|   |    | functioning of any one of them.                                    |     |         |
|   | b) | Distinguish between:                                               | CO2 | 7 Marks |
|   |    | i) Mechanism and Machine.                                          |     |         |
|   |    | ii) Analysis and Synthesis of mechanisms.                          |     |         |

iii) Kinematics and dynamics.

#### (**OR**)

- 2 a) Explain Grubler's criterion for determining degree of freedom for CO1 7 Marks 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.
  - b) Identify the kinematic chains to which the following mechanisms belong: CO6 7 Marks
    - i) Steam engine mechanism.
    - ii) Beam engine.
    - iii) Whitworth quick return motion mechanism.
    - iv) Elliptical trammels.

### UNIT-II

- The figure shows a mechanism in which OA=QC=100mm, CO2 14 Marks 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.



(**OR**)

Time: 3 hours

3

- 4 a) Discuss the three types of instantaneous centres for a mechanism.
  - 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.



(UNIT-III)

- 5 a) What are straight line mechanisms? Describe one type of exact straight CO2 7 Marks line motion mechanism with the help of a sketch.
  - b) Two shafts with an included angle of 160° are connected by a Hooke's CO2 7 Marks 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.

### (OR)

- 6 a) Describe the Watt's parallel mechanism for straight line motion and CO2 7 Marks derive the condition under which the straight line is traced.
  - b) The angle between the axes of two shafts connected by Hooke's joint is CO2 7 Marks 18°. Determine the angle turned through by the driving shaft when the velocity ratio is maximum and unity.

### UNIT-IV

- 7 a) Sketch two teeth of a gear and show the following. CO4 7 Marks Face, flank, top land, bottom land, addendum, dedendum tooth thickness, space width, face width and circular pitch.
  - b) How can you deduce the advantages of involutes systems over cycloidal CO4 7 Marks system?

### (**OR**)

- 8 a) What is the difference between a simple gear train and a compound gear CO4 7 Marks train? Explain with the help of sketches.
  - b) An epicyclic gear consists of a pinion, a wheel of 40 teeth and an annulus CO3 7 Marks 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.

CO2 4 Marks CO2 10 Marks

## UNIT-V

- 9 a) Draw the displacement, velocity and acceleration diagrams for a follower CO5 4 Marks when it moves with uniform acceleration and retardation. Derive the expression for velocity and acceleration during outstroke and return stroke of the follower.
  - b) It is required to set out the profile of a cam with oscillating follower for CO5 10 Marks 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.

### (OR)

A cam rotating clockwise at a uniform speed of 1000 r.p.m. is required to CO6 give a roller follower the motion defined below :

5 14 Marks

- 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.

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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]

Max. Marks: 70

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

## UNIT-I

| 1  | a)<br>b) | What are the important factors to be considered in casting?<br>State the application of sweep and skeleton pattern.                          | CO1<br>CO2 | 7 Marks<br>7 Marks |
|----|----------|----------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|
| 2  | a)<br>b) | Discuss the various elements that comprise the gating system.<br>State the various methods for testing moulding sand.                        | CO3<br>CO3 | 7 Marks<br>7 Marks |
|    |          | (UNIT-II)                                                                                                                                    |            |                    |
| 3  | a)<br>b) | Distinguish between permanent mould casting and die casting.<br>Describe the procedure of making castings by the investment casting process. | CO4<br>CO3 | 7 Marks<br>7 Marks |
|    |          | (OR)                                                                                                                                         |            |                    |
| 4  | a)<br>b) | What are the methods of non-destructive testing used in foundries?<br>Explain casting defects with causes and their remedies.                | CO4<br>CO4 | 7 Marks<br>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.<br>(OR)                                                                     | CO5        | 7 Marks            |
| 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. <b>(OR)</b>                                                            | CO4        | 7 Marks            |
| 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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II B.Tech I Semester (SVEC-16) Supplementary Examinations February – 2021

## STRENGTH OF MATERIALS

#### [ Mechanical Engineering ]

Time: 3 hours

### 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 CO1 6 Marks and explain each of them in detail.
  - b) Three steel bars are made with cross sectional shape of circular with CO2 8 Marks 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  $E= 2 \times 10^5 \text{ N/mm}^2$ .

#### (**OR**)

2 Calculate the elongation of a copper bar of solid circular cross section CO3 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.



## UNIT-II

Draw the shear force and bending moment diagram for the beam shown CO6 14 Marks in Fig. 1. Locate the point of contraflexure if any. Also find the point of maximum bending moment.



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A cantilever of length 6m carries two point loads of 2KN and 3KN at a CO6 14 Marks 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.

SVEC-16

Max. Marks: 70

CO3 14 Marks

## UNIT-III

5 Derive torsion equation and define polar section modulus. 6 Marks CO1 a) The steel axle of a large winch on an ocean liner is subjected to a torque b) CO2 8 Marks of 1.65KN-m. What is the minimum required diameter  $d_{min}$ , if the allowable shear stress is 48MPa and the allowable rate of twist is  $0.75^{\circ}$ /m. Assume that the shear modulus of elasticity is 80 GPa. **(OR)** 6 A Cast iron beam 20mm x 20mm in section and 100cm long is simply CO3 14 Marks supported at the ends. It carries a point load W at the centre. The maximum stress induced is 120N/mm<sup>2</sup>. What uniformly distributed load will break a cantilever of the same material 50mm wide, 100mm deep and 2m long. UNIT-IV) 7 Calculate the slope at ends and deflection at the middle of simply CO2 14 Marks 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. (**OR**) 8 A simply supported beam of 4m length and of uniform rectangular cross CO4 14 Marks 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  $E = 210 GN/m^2$ .

## UNIT-V

9 A cylindrical vessel whose ends are closed by means of rigid flange CO4 14 Marks 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  $E = 2 \times 10^5 N/mm^2$  and poisson's ratio of 0.3.

## (OR)

10 Determine the maximum and minimum hoop stress across the section of CO5 14 Marks a pipe of 400mm internal diameter and 100mm thick, when the pipe contains a fluid at a pressure of 8N/mm<sup>2</sup>. Also sketch the radial pressure distribution and hoop stress distribution across the section.

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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]

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<br>displacement work and state the conditions under which that equation is<br>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 <sup>3</sup> and P is the pressure in bar. Determine the work done when the volume changes from 3 to 6m <sup>3</sup> .                                                                                                                                                                                                                                                                                      | CO2        | 7 Marks             |
| 3 | a)       | State First law of thermodynamics applied to a closed system undergoing                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 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 <sup>3</sup> /kg specific volume and leaving at 5m/s, 700kPa and 0.19m <sup>3</sup> /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.<br>i) Compute the rate of shaft work input to the air in Kw.<br>ii) Find the ratio of inlet pipe diameter to the outlet pipe diameter. | CO3        | 7 Marks             |
| 5 | a)<br>b) | Define Entropy and prove that Entropy is a property of a system.<br>0.04m <sup>3</sup> of nitrogen contained in a cylinder behind a piston is initially at<br>1.06 bar and 15C. The gas is compressed isothermally and reversibly<br>until the pressure is 4.8 bar. Calculate:<br>i) The change of entropy.<br>ii) The heat flow.<br>iii) The work done.<br>Assume nitrogen to act as a perfect gas. Molecular weight of<br>nitrogen=28.                                                                                    | CO4<br>CO4 | 7 Marks<br>7 Marks  |
|   |          | (OR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            |                     |
| 6 | a)<br>b) | Define Availability and Irreversibility.<br>A system at 500 K receives 7200 kJ/min from a source at 1000K. The<br>temperature of atmosphere is 300K. Assuming that the temperature of<br>system and source remains constant during heat transfer, find out:<br>i) The entropy produced during heat transfer.<br>ii) The decrease in available energy after heat transfer.                                                                                                                                                   | CO4<br>CO4 | 4 Marks<br>10 Marks |

## UNIT-IV

| 7  | a)  | Define the following terms as applied to pure substance steam.                               | CO1  | 7 Marks |
|----|-----|----------------------------------------------------------------------------------------------|------|---------|
|    |     | i) Sensible heat of water. (ii) Latent heat.                                                 |      |         |
|    |     | iii) Dryness fraction of steam. (iv) Heat of superheat.                                      |      |         |
|    | b)  | Find the internal energy and entropy of 1 kg of steam at 10 bar, when the                    | CO2  | 7 Marks |
|    |     | condition of steam is:                                                                       |      |         |
|    |     | i) 0.85 dry.                                                                                 |      |         |
|    |     | ii) Dry and saturated.                                                                       |      |         |
|    |     | iii) Superheated with degree of superheat being 50 C.                                        |      |         |
|    |     | (OR)                                                                                         |      |         |
| 8  | a)  | Derive an expression for entropy change of an ideal gas in different                         | CO1  | 7 Marks |
|    |     | forms.                                                                                       |      |         |
|    | b)  | Show that for an ideal gas, the slope of the constant volume line on the                     | CO4  | 7 Marks |
|    |     | T-s diagram is more than that of the constant pressure line.                                 |      |         |
|    |     | (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                         | CO5  | 7 Marks |
|    |     | 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.                                                          |      |         |
|    |     | (OR)                                                                                         | ~~ . |         |
| 10 | a)  | Compare Otto, Diesel and Dual combustion cycles for the same                                 | CO4  | 7 Marks |
|    | 1 \ | compression ratio and heat rejected.                                                         | 005  | 7 ) ( 1 |
|    | b)  | The swept volume of a diesel cycle engine working on dual cycle is                           | CO5  | / Marks |
|    |     | 0.0053m <sup>3</sup> and clearance volume is 0.00035m <sup>3</sup> . 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°C and 0.9 bar.                           |      |         |
|    |     | Determine the air standard efficiency of the cycle. Take $\gamma = 1.4$ for air.             |      |         |

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

## ELECTRONIC CIRCUIT ANALYSIS AND DESIGN

[Electronics and Communication Engineering]

#### **Answer One Ouestion from each Unit** All questions carry equal marks UNIT-I 1 Derive the voltage gain, current gain and input impedance expressions for a) CO<sub>2</sub> 7 Marks CB amplifier using exact h-parameter model. CO<sub>4</sub> 7 Marks b) The h-parameters of the transistor used in CE amplifier are $h_{fe} = 50$ , $h_{ie}=1.1$ K $\Omega$ , $h_{re}=2.5$ x $10^{-4}$ , $h_{oe}=24$ $\mu$ A/V. Find out current gain and voltage gains with and without source resistance, input and output impedances, given that $R_L = 10 \text{ K}\Omega$ and $R_S = 1 \text{ K}\Omega$ . (**OR**) 2 What are the important characteristics of a cascade amplifier? Draw the a) CO<sub>2</sub> 7 Marks circuit of CE-CC cascade amplifier and determine an expression for its voltage gain in terms of its circuit parameters. b) With the help of a neat circuit diagram, analyze the working of a cascode CO1 7 Marks amplifier UNIT-II 3 for the Derive the expression hybrid-π parameters CO2 8 Marks a) $g_m, r_{b'}e, g_{ce}, r_{b'}c, r_{bb'}$ and diffusion capacitance. An amplifier is represented by the following circuit shown, find the mid- CO4 b) 6 Marks band frequency gain. Lower and upper cutoff frequencies 5µF 10K 2pF≠ 101 V, <sup>></sup> Vi /50 <sup>(</sup> (**OR**) Select one amplifier using FET which provides unity voltage gain and 4 a) CO5 6 Marks explain its behavior with necessary expressions. Derive the expression for CE short circuit current gain and draw its b) CO<sub>2</sub> 8 Marks

frequency response.

## 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 CO6 6 Marks increase the input resistance and output resistance.

(OR)

Time: 3 hours

Max. Marks: 70
| 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 $20\mu$ H while the frequency is to be changed from 950 kHz to 2050 kHz.        | CO3 | 4 Marks   |
|    | c)         | Design the minimum value of h <sub>fe</sub> in a transistor Colpitt's oscillator                                                                                                       | CO3 | 4 Marks   |
|    |            | L=100 $\mu$ H, C <sub>1</sub> =0.001 $\mu$ F, C <sub>2</sub> =0.01 $\mu$ F for providing sustained oscillations.                                                                       |     |           |
| 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 <b>dc</b> 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                                                  | CO4 | 4 Marks   |
|    | <b>b</b> ) | Stages.<br>The bandwidth for double tuned amplifier is 20kHz Calculate the                                                                                                             | CO4 | 3 Marks   |
|    | 0)         | handwidth if such three stages are cascaded                                                                                                                                            | 004 | J WILLING |
|    | 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   |

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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 Illustrate the difference between analog, discrete and digital signals. CO2 a) 7 Marks Draw the graphical representation of :

i) 
$$u[-n-2]$$
. ii)  $u[-n+2]$ . iii)  $u[n] -u[n-10]$ .

b) Illustrate whether the following signals are periodic or aperiodic. If the CO4 7 Marks signal is periodic find its fundamental period.

i) 
$$x(n) = 3 \cos(10n + \pi/6)$$
  
(OR)  
ii)  $x(n) = e^{(j \pi n/2)}$ .

2 A Continuous time signal is shown in figure. Sketch and label each of the CO2 7 Marks a) following signals.

i) 
$$y_1(t) = x(t) \cdot u(1-t)$$

i) 
$$y_1(t) - x(t)$$
.  $u(1-t)$   
ii)  $y_2(t) = x(t) \{u(t) - u(t-1)\}$ 

Find the Fourier Transform of the signal.



b) Let  $x(t) = e^{j 2t}$  and  $y(t) = e^{j \pi t}$ , and consider their sum z(t) = x(t) + y(t), CO4 7 Marks 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

CO3

CO1

$$x(t) = x^{1}(t) * x^{2}(t)$$
 where,  $x^{1}(t) = e^{-2t} u(t)$  and  $x^{2}(t) = u(t)$ .

b) CO1 7 Marks State and prove any three properties of Fourier Series.

(**OR**)

4 a)

6

a)

3

a)

The given rectangular pulse is  $x(t) = \begin{cases} 1, & |t| < T_1 \\ 0, & |t| > T_1 \end{cases}$ . Find the Fourier

- transform.
- b) What is an LTI system and Impulse response of a system? Explain CO1 7 Marks briefly.

# UNIT-III)

- 5 a) Differentiate convolution and correlation of signals with examples. CO1 7 Marks An excitation and impulse response of the system are given. Find the CO<sub>2</sub> 7 Marks b) responses. x(t) = u(t); h(t) = 2u(t-1) - 2u(t-4)(**OR**)
  - Explain Parseval's theorem and power density spectrum.
  - Discuss about detection of periodic signals in the presence of noise by CO5 7 Marks b) correlation.

SVEC-16

7 Marks

7 Marks

#### **UNIT-IV** A signal has Laplace transform $X(s) = \frac{s+2}{s^2+4s+5}$ . Find Laplace 7 CO4 7 Marks a) 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 *x*(2*t*). (**OR**) 8 CO1 7 Marks a) Explain properties of ROC in Laplace transform. CO3 7 Marks b) Find the Laplace transform of x(t) = t e u(t). UNIT-V 9 Consider the following sampling and reconstruction configuration: a) CO5 7 Marks 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. x(t) sample at x[n] ideal reconstruction (b) 7 ideal lowpass filter Build the concept of Sampling theorem with neat diagrams. CO1 7 Marks b) (**OR**) 10 Find the z- transform of the following using ZT properties. CO4 7 Marks a) i) x[n]=n(1/3)<sup>n</sup> u[n] ii) x[n] = (1/4) u[n-2)Determine the inverse ZT of the sequence $X[z] = \frac{1 - 2z^{-1}}{1 + \frac{1}{2}z^{-1}}$ , if x(n) is: b) CO4 7 Marks i) Causal sequence. ii) Anti causal sequence.

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#### 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 Ouestion from each Unit** All questions carry equal marks UNIT-I 1 Each of the following arithmetic operations is correct in at least one CO1 6 Marks a) number system. Determine the bases in each operation: i) 41/3 = 13. ii) $\sqrt{41} = 5$ Given the following Boolean function: b) CO1 8 Marks F = xy'z + x'y'z + w'xy + wx'y + wxyi) Obtain the truth table of the function. ii) Draw the logic diagram using the original Boolean expression. (**OR**) 2 Verify that the following operations are commutative but not associative. CO1 6 Marks a) i) NAND. ii) NOR. b) Expand and simplify the expressions using De Morgan's theorem: CO1 8 Marks i) F(A, B, C) = (A + B)'(ABC)'(A'C)'. ii) F(A, B, C) = [(AB + B'C) + (BC' + A'B)]'UNIT-II ) Simplify the following Boolean expression and implement with NAND 3 a) CO1 6 Marks gates $F=\Sigma(0, 1, 2, 4, 5, 7, 11, 15)$ . Convert the given expressions into sum of products and product of sums: b) CO1 8 Marks i) (AB + C)B + C'D. ii) x' + x(x + y')(y + z'). (**OR**) Simplify the following Boolean function using Tabulation method. 4 a) CO1 8 Marks $F(A, B, C, D) = \Sigma(1, 3, 4, 5, 10, 11, 12, 13, 14, 15).$ Find the minimum product-of-sums form for the following function and b) CO1 6 Marks implement the function using NOR gates only: $F = \Sigma (4, 5, 8, 9, 12, 13) + d (0, 3, 7, 10, 11).$ (UNIT-III) 5 Design the 4-bit BCD adder and illustrate its operation. CO<sub>2</sub> 7 Marks a) A combinational circuit is defined by the following functions: CO<sub>2</sub> 7 Marks b) $F_1 = x'y' + xyz'; F_2 = x' + y; F_3 = xy + x'y'$ Design the circuit with a decoder and external OR gates. (OR)6 Show that a full-subtractor can be constructed with two half-subtractors CO2 7 Marks a) and an OR gate. Implement a full adder function using 4 x 1 multiplexers. b) CO<sub>2</sub> 7 Marks UNIT-IV Illustrate the operation of MSJK flip-flop using NAND gates. 7 a) CO<sub>2</sub> 6 Marks CO5 8 Marks

| Present | Next State |       | Out   | tput  |
|---------|------------|-------|-------|-------|
| State   | x = 0      | x = 1 | x = 0 | x = 1 |
| a       | f          | b     | 0     | 0     |
| b       | d          | С     | 0     | 0     |
| С       | f          | е     | 0     | 0     |
| d       | g          | а     | 1     | 0     |
| е       | d          | С     | 0     | 0     |
| f       | f          | b     | 1     | 1     |
| g       | g          | h     | 0     | 1     |
| ħ       | g          | а     | 1     | 0     |

8 a) Reduce the number of states in the following state table and tabulate the CO2 7 Marks reduced state table.

b) The contents of a serial-in/serial-out shift register are DCBA = 0101, CO2 7 Marks 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.

# (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 |
|    |    |                                                                    |     |         |

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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 Derive the expressions for A<sub>I</sub>, A<sub>V</sub>, R<sub>i</sub>, and R<sub>o</sub> for common emitter CO1 8 Marks a) amplifier with unbypassed R<sub>E</sub>. Draw the high frequency hybrid- $\pi$  model for a CE transistor and indicate CO1 b) 6 Marks typical values of circuit parameters. (**OR**) 2 Compare the three types of coupling methods used in multistage CO1 6 Marks a) amplifiers. b) Given the following transistor measurements made at  $I_{c} = 5mA$ , CO4 8 Marks
  - b) Given the following transistor measurements made at  $I_C = 5mA$ , CO4 8 Marks  $V_{CE} = 10V$  and at room temperature  $h_{fe} = 100$ ,  $h_{ie} = 600\Omega$ ,  $A_{ie} = 10$  at 10MHz, Ce = 3pF. Find  $f_{\beta}$ ,  $f_T$ , Ce, rb'e and rbb'.

# UNIT-II)

- 3 a) Draw the circuit diagram of current series feedback amplifier and derive CO3 8 Marks the expressions for voltage gain, output impedance and input impedance.
  - b) An amplifier has an open loop gain of 1000 and a feedback ratio of 0.04. CO1 6 Marks If the open loop gain changes by 10% due to temperature, find the percentage change in gain of the amplifier with feedback.

#### (**OR**)

- 4 a) Classify various oscillators based on output waveforms, circuit CO1 8 Marks components, operating frequencies and feedback sued.
  - b) In a RC phase shift oscillator, the feedback network uses  $R = 6K\Omega$  and CO2 6 Marks C = 1500 pF. The transistorized amplifier used, has a collector resistance of 18K $\Omega$ . Calculate the frequency of oscillations and minimum value of  $h_{fe}$  of the transistor.

# UNIT-III

- 5 a) How the even harmonics in push pull amplifier are are eliminated. Using CO2 8 Marks five point method, derive an expression for the total harmonic distortion.
  - b) A transistor used in audio frequency amplifier, working in class A CO4 6 Marks operation supplies 0.8W to  $4K\Omega$  load. The zero signal d.c. collector current is 31mA and the DC collector current with signal is 36mA. Determine the second harmonic distortion.

#### (OR)

- 6 a) With a neat diagram, explain the principle of operation of class B push CO1 6 Marks pull amplifier and obtain the maximum value of overall efficiency.
  - b) Design a class-B push pull amplifier to deliver 20 Watts to a load of  $16\Omega$ . CO3 8 Marks Given  $V_{CC} = V_m = 40$ Volts.

# UNIT-IV

- 7 a) Explain how a sinusoidal waveform is converted into a square wave CO1 6 Marks using clipper circuit.
  - b) Sketch the response of the RC high pass circuit excited by an exponential CO2 8 Marks input and derive the expression for output.

#### (**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                                                                  | CO2 | 8 Marks |
|    |    | 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 $V_{be(sat)} = 0$ .                                                               |     |         |
|    | b) | With the help of neat diagram, discuss the different methods of triggering                                                                       | CO1 | 6 Marks |
|    |    | a binary.                                                                                                                                        |     |         |
|    |    | (OR)                                                                                                                                             |     |         |
| 10 | a) | Draw the circuit diagram of self biased transistor binary and analyze the                                                                        | CO1 | 8 Marks |
|    |    | design.                                                                                                                                          |     |         |
|    | b) | Find the period and output frequency of an astable multivibrator with                                                                            | CO2 | 6 Marks |
|    |    | $R_1 = R_2 = 25K\Omega$ and $C_1 = C_2 = 0.4\mu F$                                                                                               |     |         |

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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). (OR)                                                                                                                                             | CO4 | 6 Marks |
| 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 turical 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. <b>(OR)</b>                                                                                                                                                                                  | CO2 | 9 Marks |
| 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 CO6 8 Marks 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?
  - b) Distinguish between Arithmetic pipe line and Instruction pipe line CO2 6 Marks (OR)
    a) Discus the various interconnection structures with neat sketch. CO1 10 Marks
- 10 a) Discus the various interconnection structures with neat sketch.
  b) Explain the serial arbitration with neat sketch.
  CO1 10 Marks
  CO1 4 Marks

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#### 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

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

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| 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. <b>(OR)</b>                                                                                                                                                                                                                              | CO1 | 7 Marks   |
| 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<br>one dimensional array, so that the elements of first stack are stored at odd<br>index values and the elements of other stack are stored at even index<br>values". Write an algorithm to add and delete elements from these stacks.<br>(OR) | CO4 | 14 Marks  |
| 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<br>Trees maintaining balance factor while insertion and deletion takes place.<br>(OR)                                                                                                                                                        | CO3 | 14 Marks  |
| 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:<br>i) Insertion.<br>ii) Deletion operations in B-Trees.                                                                                                                                                                                                                                               | CO2 | 14 Marks  |
| 0  |    | (OR)                                                                                                                                                                                                                                                                                                               | CO1 | 14 Mortea |
| ð  |    | algorithm                                                                                                                                                                                                                                                                                                          | COI | 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  |
| 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   |

\$P (P (P)

Max. Marks: 70

Time: 3 hours

# 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]

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)                                                                                                                                                                                   | 001 | 10 1 1   |
| 2  | a)  | Discuss in detail about Python data types.                                                                                                                                             | COI | 10 Marks |
|    | 0)  |                                                                                                                                                                                        | COI | 4 Walks  |
| 2  | ``  |                                                                                                                                                                                        | 002 |          |
| 3  | a)  | Write a Dath on group to add up all the even numbers between 10 and                                                                                                                    | CO2 | 9 Marks  |
|    | D)  | 100 using while loop                                                                                                                                                                   | COS | 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                                                                                                       | CO4 | 5 Marks  |
|    |     | turtle shape.                                                                                                                                                                          |     |          |
|    |     | (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                                                                                                                       | CO4 | 8 Marks  |
|    |     | interest design with it.                                                                                                                                                               |     |          |
|    |     | 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  |
| 10 | `   | (OR)                                                                                                                                                                                   | 000 |          |
| 10 | a)  | With suitable example, explain about reusable GUI components with classes                                                                                                              | CO3 | / Marks  |
|    | b)  | Write a Python script to develop a window by adding check buttons and                                                                                                                  | CO5 | 7 Marks  |
|    | - ) | radio buttons.                                                                                                                                                                         |     |          |
|    |     |                                                                                                                                                                                        |     |          |

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#### 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 | CO6 | 8 Marks |
|---|----|------------------------------------------------------------------------------|-----|---------|
|   |    | measurement and how they can be minimized in detail.                         |     |         |
|   | 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 CO1 8 Marks system.

# UNIT-II

- 3 a) Classify various transducers and distinguish between active and passive CO2 8 Marks type with any two examples.
  - b) Choose the best instrument among A, B, C, D, E, F. Comment on each CO4 6 Marks instrument and justify the answer with valid reason.



- 4 a) List out any four dynamic characteristics of a measurement system and CO1 7 Marks give their importance in the evaluation of the system.
  - b) List different types of standard inputs required in the validation process CO1 7 Marks of a dynamic measurement system. Explain.

# (UNIT-III)

- 5 a) How can Resistive potensio meters be used for Linear and angular CO3 8 Marks displacement measurements? Derive the expression for output.
  - 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 CO3 7 Marks Measurements". Justify mathematically with the neat sketch.

# UNIT-IV

- 7 a) Explain the construction and working principle of a LVDT as an CO5 8 Marks inductive transducer. How to detect the magnitude and direction of the displacement of a core?
  - b) "LVDT " is a Passive Transducer-Justify. Explain the method of using CO5 6 Marks LVDT for the Thickness measurements.

#### (**OR**)

- 8 a) Differentiate Piezo electric and pyro electric effects and how they are CO4 7 Marks used in various industrial applications.
  - b) List out the opto electronic transducers and explain any one circuitry CO5 7 Marks operation along with the applications.

#### UNIT-V)

- 9 a) Differentiate Piezo electric and pyro electric effects and how they are CO3 7 Marks used in various industrial applications.
  - b) List out the opto electronic transducers and explain any one circuitry CO2 7 Marks operation along with the applications.

#### (**OR**)

- 10 a) Define Micro Machining. Explain surface and bulk micro machining with CO1 7 Marks neat sketch.
  - b) What is the function of Bio sensor and list out the biological parameters CO1 7 Marks measured using Bio sensors.

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#### 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

b)

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

#### UNIT-I

 $P \lor (~P \land Q) ⇔ (P \lor Q).$ 1 CO1 7 Marks a) Show that: b) Show that  $S \lor R$  is tautologically implied by  $(P \lor Q) \land (P \rightarrow R) \land (Q \rightarrow S)$ . CO<sub>2</sub> 7 Marks (**OR**) State the converse, opposite and contrapositive for the implication: 2 CO1 7 Marks a) "If the triangle is equiangular, then it is equilateral" b) Convert the following English statements to predicate logic notation: CO1 7 Marks i) All Mokeys have tails. ii) No Mokey has a tail. iii) Some Monkeys have tails. UNIT-II 3 Show that if R, S are equivalence relations on set A the RUS need not be CO1 7 Marks a) an equivalance relation Let  $X=\{1, 2, 3, 6, 12, 18\}$  and the relation | is x divides y. Draw the CO1 7 Marks b) Hasse diagram of (X, | ). (**OR**) Show that the function  $f(x) = x^2$  is not bijective function. Can we find its CO1 4 a) 7 Marks inverse? b) Define Distributive Lattice. Check whether  $(D_{20}, |)$ , where  $D_{20}$  is divisors CO1 7 Marks of 20 and | represents the relation divides. (UNIT-III) Justify whether given set 'S'.  $S=\{0, 1, 2, 3, 4, 5\}$  can be semigroup under 5 CO5 7 Marks a) binary operation  $+_5$  i.e additive modulo 5. Define Monoid and Group. Give an example of Monoid which is not an I 7 Marks b) CO5 group. (OR) Show that in a group (G, .), if  $(a.b)^2 = a^2 \cdot b^2 \quad \forall a, b \in G \text{ then } (G, .) \text{ is}$ 6 CO5 7 Marks a) abelian. State and Prove Lagranges theorem. CO5 7 Marks b) UNIT-IV) 7 Prove by using Mathematical Induction, (x-y) divides  $(x^n - y^n)$ ,  $\forall n \ge 1$ . CO1 7 Marks a) i) How many different license plates are there (allowing repetitions), CO5 7 Marks b) 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. (**OR**) 7 Marks 8 CO1 a) Solve the Reccurence Relation  $\mathbf{F_n} = \mathbf{F_{n-1}} + \mathbf{F_{n-2}}$ ,  $n \ge 2$  and  $\mathbf{F_0} = \mathbf{F_1} = 1$ .

Max. Marks: 70

CO1

7 Marks

Solve the Reccurence Relation  $a_n-6a_{n-1}+8a_{n-2}=n.4^n$ .



9

(OR)

a) Write the algorithm for Breadth First Search. Explain with an example.
b) State Prims algorithm. Explain Prims algorithm with an example.
CO3 7 Marks
CO3 7 Marks

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# 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

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

# UNIT-I

| 1 | a)<br>b)      | What is system call? Explain various types of system calls.<br>Describe the elements of process control block. | CO1<br>CO1  | 9 Marks<br>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                                           | CO1         | 7 Marks            |
|   |               | suitable diagram.                                                                                              |             |                    |
|   |               | UNIT-II                                                                                                        |             |                    |
| 3 | a)            | What is critical section? Discuss the solution of the critical section                                         | CO2         | 6 Marks            |
|   |               | problem.                                                                                                       |             |                    |
|   | b)            | Consider the table given below for a system, Resource – 3 types                                                | CO2         | 8 Marks            |
|   |               | 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                                                                                                    |             |                    |
|   |               | 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 1                                                                                               |             |                    |
|   |               | 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            |
|   | ,             |                                                                                                                |             |                    |
| 5 | a)            | What is paging? Discuss the paging model of logical and physical                                               | $CO^2$      | 7 Marks            |
| 5 | u)            | memory                                                                                                         | 002         | / WILLING          |
|   | h)            | What is the cause of thrashing? How thrashing can be eliminated?                                               | $CO^2$      | 7 Marks            |
|   | 0)            | (OR)                                                                                                           | 002         | / IVIUIND          |
| 6 | a)            | Describe the hardware requirements to support the segmentation                                                 | $CO^2$      | 7 Marks            |
| 0 | $\frac{u}{h}$ | Illustrate the page replacement algorithms i) LRU ii) Ontimal page                                             | $CO^2$      | 7 Marks            |
|   | 0)            | replacement Use the reference string 7 0 1 2 0 3 0 4 2 3 0 3 2 1                                               | 002         | / IVIUIND          |
|   |               | 2 0 1 7 0 1 for a memory with three frames                                                                     |             |                    |
|   |               |                                                                                                                |             |                    |
| 7 | -)            | Describe the file system Architecture with discourse                                                           | <b>CO</b> 2 | 7 Maula            |
| / | a)            | Describe the file system Architecture with diagram.                                                            | CO3         | / Marks            |
|   | U)            | Explain various disk scheduling algorithms with suitable diagrams.                                             | 004         | / iviarks          |
| 0 |               | (UK)                                                                                                           | $CO^{2}$    | 7 Manles           |
| ð | a)<br>b)      | Discuss about various rile Access methods.                                                                     | CO3         | / IVIATKS          |
|   | D)            | Explain about swap space management.                                                                           | 004         | / IVIATKS          |
|   |               |                                                                                                                |             |                    |

Max. Marks: 70

# UNIT-V

| 9  | a) | What are the advantages and disadvantages of supporting memory                                                          | CO5 | 7 Marks |
|----|----|-------------------------------------------------------------------------------------------------------------------------|-----|---------|
|    |    | mapped I/O to device control registers.                                                                                 |     |         |
|    | 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<br>and the role based access control facility? | CO5 | 8 Marks |

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

#### JAVA PROGRMMING

[ Computer Science and Systems Engineering ]

Max. Marks: 70

6 Marks

#### 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  | CO2 | 6 Marks  |
|    |    | average of given 10 numbers using "for each" loop.                         |     |          |
|    |    | (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           | CO1 | 14 Marks |
|    |    | inheritances with suitable examples.                                       |     |          |
|    |    | (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    | CO4 | 6 Marks  |
|    |    | example program.                                                           |     |          |
|    | 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 | CO5 | 8 Marks  |
|    |    | listeners with suitable example.                                           |     |          |
|    | 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          | CO6 | 8 Marks  |
|    |    | GenericServlet with detailed deployment steps.                             |     |          |

b) Explain Http Servlet Life–Cycle with neat sketch. CO6

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Time: 3 hours

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

# LINÚX 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                 | 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:                                              | CO1   | 6 Marks        |
|   |     | 1) Text Editors. 11) The C Compiler.                                               |       |                |
| • | ``  |                                                                                    |       | <b>5</b> ) ( 1 |
| 3 | a)  | Illustrate how inputs and outputs of Linux programs can be redirected.             | CO5   | 7 Marks        |
|   | D)  | I wo numbers are entered through the keyboard. Write a shell script to             | 003   | / Marks        |
|   |     | (OR)                                                                               |       |                |
| 4 | a)  | What is meant by Shell? Describe in detail the Shell environment with a            | CO1   | 7 Marks        |
|   |     | neat sketch.                                                                       |       |                |
|   | b)  | Write a shell script which gets executed the moment the user logs in. It           | CO5   | 7 Marks        |
|   |     | should display the message "good morning", "good afternoon", "good                 |       |                |
|   |     | evening" based on the time of login.                                               |       |                |
| _ |     |                                                                                    | ~ ~ • |                |
| 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.    | COI   | / Marks        |
|   |     | (OR)                                                                               |       |                |
| 6 | a)  | Explain the following Standard I/O library commands:                               | CO2   | 8 Marks        |
|   | 1 \ | 1) fopen. 11) fwrite. 111) fseek. 1V) puts.                                        | 004   |                |
|   | b)  | Write a shell script that accepts a file name, starting and ending line            | CO4   | 6 Marks        |
|   |     | numbers as arguments and displays all the lines between the given line             |       |                |
|   |     |                                                                                    |       |                |
| 7 | a)  | Illustrate the working principle of parent process and child process using         | CO6   | 7 Marks        |
| / | a)  | fork system call                                                                   | 000   |                |
|   | b)  | Define signal and mention the different types of signal sources, illustrate        | CO1   | 7 Marks        |
|   | ,   | the catching of signal with example.                                               |       |                |
|   |     | (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               | CO5   | 8 Marks        |
|   |     | 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.              |       |                |

# UNIT-V

- 9 a) Define socket. Illustrate socket attributes and the process of creating a CO1 7 Marks socket.
  - b) Does the FIFO pipe overcome the limitations of normal pipe? Justify CO6 7 Marks your answer.

### (OR)

- a) Define pipe. Create a named pipe using mknod with an example
  b) Develop a C program to setup a two-way pipe between parent and child
  CO6
  8 Marks
  - processes so that both can send and receive signals.

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## 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 ]

| ]  | fime: 3                                            | hours                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Max. Marks: 60 |     |        |     |  |  |  |  |  |  |
|----|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----|--------|-----|--|--|--|--|--|--|
|    |                                                    | Answer One Question from each Unit<br>All questions carry equal marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |     |        |     |  |  |  |  |  |  |
|    |                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |     |        |     |  |  |  |  |  |  |
| 1. | a)                                                 | Find the positive root of the equation $2x - \log_{10} x = 7$ , by Regula-                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 6 Marks        | L3  | CO1    | PO1 |  |  |  |  |  |  |
|    | b)                                                 | False method.<br>Find the root of the equation $x \sin x + \cos x = 0$ using Newton-<br>Bankson method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 6 Marks        | L3  | CO1    | PO2 |  |  |  |  |  |  |
|    |                                                    | (OR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                |     |        |     |  |  |  |  |  |  |
| 2. | a)                                                 | Apply Newton's forward formula, find the value of $f(1.6)$ , if<br>$\begin{array}{c} x \\ \hline x \\ \hline f(x) \\ \hline x \\ \hline f(x) \\ \hline x \\ x \\$ | 6 Marks        | L3  | CO1    | PO2 |  |  |  |  |  |  |
|    | b)                                                 | Apply Lagrange's interpolation formula to find the value of y<br>when $x = 9$ , if the following values of x and y are given:<br>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 6 Marks        | L3  | CO1    | PO1 |  |  |  |  |  |  |
|    |                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |     |        |     |  |  |  |  |  |  |
| 3. | a)                                                 | Find the first and second derivatives at $x = 1.1$ if<br>x 1.0 1.2 1.4 1.6 1.8 2.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 6 Marks        | L1  | CO1    | PO2 |  |  |  |  |  |  |
|    | b)                                                 | $\begin{array}{c c c c c c c c c c c c c c c c c c c $                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 6 Marks        | L3  | CO1    | PO1 |  |  |  |  |  |  |
|    |                                                    | $\begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 $                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |     |        |     |  |  |  |  |  |  |
| 4. | a)                                                 | Apply the Taylor's series method, solve<br>$\frac{dy}{dx} = x - y^2 + y(0) = 1$ at $x = 0.1$ and $x = 0.2$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 6 Marks        | L3  | CO1    | PO1 |  |  |  |  |  |  |
|    | b)                                                 | $\frac{dx}{dx} = xy, \ y(0) = 1 \ at \ x = 0.2 \ (take \ h = 0.2).$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 6 Marks        | L3  | CO1    | PO1 |  |  |  |  |  |  |
|    |                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |     |        |     |  |  |  |  |  |  |
| 5  | a)                                                 | For the discrete probability distribution                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 6 Marks        | T 1 | $CO^2$ | PO2 |  |  |  |  |  |  |
| 5. | u)                                                 | $\begin{array}{ c c c c c c c c c c c c c c c c c c c$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0 10101185     | LI  | 002    | 102 |  |  |  |  |  |  |
|    |                                                    | 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<br>density function $f(x) = \begin{cases} k(1 - x^2), when \ 0 < x < 1 \\ 0, \ else \ where \end{cases}$ then find the                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 6 Marks        | L2  | CO2    | PO1 |  |  |  |  |  |  |
|    | value of $k$ mean and variance of the distribution |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |     |        |     |  |  |  |  |  |  |

value of k, mean and variance of the distribution.

#### (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                  | 6 Marks     | L2  | CO2         | PO1 |
|    |           | probability function and find $P(1 \le r \le 2)$                                                                                     |             |     |             |     |
|    |           |                                                                                                                                      |             |     |             |     |
| 7  | a)        | 30% of the items from a factory are defective. Find the                                                                              | 6 Marks     | T 1 | $CO^{2}$    | PO2 |
| 7. | <i>a)</i> | <ul><li>i) one is defective.</li><li>ii) at least five are defective.</li></ul>                                                      | 0 Warks     | LI  | 002         | 102 |
|    | b)        | A certain area of the eastern United States is, on average, hit by 6                                                                 | 6 Marks     | L2  | CO2         | PO1 |
|    | 0)        | hurricanes a year. Find the probability that in a given year that                                                                    | 0 11101110  |     | 002         | 101 |
|    |           | area will be hit by fewer than 4 hurricanes and anywhere from 6                                                                      |             |     |             |     |
|    |           | to 8 hurricanes.                                                                                                                     |             |     |             |     |
| 0  | ``        | (OR)                                                                                                                                 |             | т 2 | 000         | DOO |
| 8. | a)        | In a Photographic process, the time to process 8 X 10 prints from                                                                    | 6 Marks     | L3  | CO2         | PO2 |
|    |           | 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.                                                                             |             |     |             |     |
|    | b)        | Suppose that a study of a certain computer system reveals that                                                                       | 6 Marks     | L2  | CO2         | PO1 |
|    |           | the response time, in seconds, has an exponential distribution with a mean of 2 seconds.                                             |             |     |             |     |
|    |           | i) What is the probability that response time exceeds 5 seconds?                                                                     |             |     |             |     |
|    |           | i) What is the probability that response time exceeds 5 seconds:                                                                     |             |     |             |     |
|    |           | seconds?                                                                                                                             |             |     |             |     |
|    |           | UNIT-V                                                                                                                               |             |     |             |     |
| 9. | a)        | A sample of 400 items are taken from a population whose                                                                              | 6 Marks     | L3  | CO2         | PO4 |
|    |           | standard deviation is 10. The mean of the sample is 40. Test                                                                         |             |     |             |     |
|    |           | whether the sample has come from a population with mean 38.                                                                          |             |     |             |     |
|    | 1)        | Also calculate 95% confidence interval for the population.                                                                           |             | тр  | <b>CO</b> 2 |     |
|    | D)        | In a big city 325 men out of 600 men were found to be smokers.                                                                       | 6 Marks     | L3  | 002         | PO4 |
|    |           | men in this city are smokers?                                                                                                        | -           |     |             |     |
|    |           | (OR)                                                                                                                                 |             |     |             |     |
| 10 | a)        | A random sample of six steel beams has a compressive strength                                                                        | 6 Marks     | L3  | CO2         | PO4 |
|    |           | 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                                                                            |             |     |             |     |
|    | h)        | 1000 students at college level were graded according to their LO                                                                     | 6 Marks     | 13  | $CO^{2}$    | PO4 |
|    | 0)        | and the economic conditions of their home. Use Chi-square test                                                                       |             | ĽJ  | 002         | 104 |
|    |           | to find out whether there is any association between condition at                                                                    | -<br>-<br>- |     |             |     |
|    |           | home and I.Q at 0.05 level of significance.                                                                                          |             |     |             |     |
|    |           | Economic condition High Low                                                                                                          |             |     |             |     |
|    |           | Rich 460 140                                                                                                                         |             |     |             |     |
|    |           | Poor 240 160                                                                                                                         |             |     |             |     |

(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<br>All questions carry equal marks                          |           |     |                |             |  |  |
|               |    | UNIT-I                                                                                         |           |     |                |             |  |  |
| 1.            | a) | Define gamma function and express $\int_0^\infty x^{p-1} e^{-kx} dx \ (k > 0)$                 | 6 Marks   | L1  | CO1            | PO1         |  |  |
|               |    | in terms of gamma function.                                                                    |           |     |                |             |  |  |
|               | 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 $\int_{0}^{1} x^{3} (1 - \sqrt{x})^{5} dx = 2\beta$ (8,6).                          | 6 Marks   | L2  | CO1            | PO1         |  |  |
|               |    | UNIT-II                                                                                        |           |     |                |             |  |  |
| 3.            | a) | Express $J_5(x)$ in terms of $J_0(x)$ and $J_1(x)$ .                                           | 6 Marks   | L3  | CO1            | PO1         |  |  |
|               | b) | Show that $(n+1) P_{n+1}(x) = (2n + 1) x P_n(x) - n P_{n-1}(x)$ .                              | 6 Marks   | L2  | CO1            | PO1         |  |  |
|               |    | (OR)                                                                                           |           | × 0 | <b>G A</b>     | <b>D</b> 00 |  |  |
| 4.            | a) | Show that $J_{\frac{1}{2}}(x) = \sqrt{\frac{2}{\pi x}} \sin x.$                                | 6 Marks   | L2  | CO2            | PO2         |  |  |
|               | b) | Prove that $P_n(x) = \frac{1}{2^n n!} \frac{d^n}{dx^n} (x^2 - 1)^n$ .                          | 6 Marks   | L2  | CO1            | PO1         |  |  |
|               |    | (UNIT-III)                                                                                     |           |     |                |             |  |  |
| 5.            | a) | Define analytic function and construct the analytic function                                   |           |     |                |             |  |  |
|               |    | $f(z) = u + iv$ where $u = e^{x^2 - y^2} \cos 2xv$                                             | 6 Marks   | L3  | CO3            | PO2         |  |  |
|               | b) |                                                                                                | 6 Marks   | 12  | $CO^{2}$       | PO1         |  |  |
|               | 0) | Discuss the transformation $W = \sqrt{z}$ . Is it Conformal at the                             | 0 Iviaiks | LZ  | 002            | 101         |  |  |
|               |    | (OR)                                                                                           |           |     |                |             |  |  |
| 6.            | a) | Find the analytic function                                                                     | 6 Marks   | L3  | CO2            | PO2         |  |  |
|               |    | $f(z) = u + iv$ if $2u + v = e^{x} (\cos y - \sin y)$ .                                        |           |     |                |             |  |  |
|               | b) | Find the bilinear transformation which maps the points                                         | 6 Marks   | L2  | CO2            | PO2         |  |  |
|               |    | z = 1, i, -1 on to the points $w = i$ , 0,-i.                                                  |           |     |                |             |  |  |
|               |    | (UNIT-IV)                                                                                      |           |     |                |             |  |  |
| 7.            |    | $\int \frac{Sin^2 z}{z} dz$                                                                    | 12 Marks  | L2  | CO2            | PO2         |  |  |
|               |    | Write Cauchy's integral formula and evaluate $\int_{C}^{J} \left(z - \frac{\pi}{6}\right)^{3}$ |           |     |                |             |  |  |
|               |    | where C is the Circle $ z  = 1$ .                                                              |           |     |                |             |  |  |

(**OR**)

| 8. | a) | Evaluate f (2) and f (3) where $f(a) = \int_{C} \frac{2z^2 - z - 2}{z - a} dz$                                                       | 6 Marks  | L3 | CO2 | PO2 |
|----|----|--------------------------------------------------------------------------------------------------------------------------------------|----------|----|-----|-----|
|    | b) | and C is the Circle $ z  = 2.5$ .<br>Expand $f(z) = \frac{z-1}{z+1}$ in Taylor's series about the Point $z = 1$ .                    | 6 Marks  | L2 | CO2 | PO1 |
| 9. | a) | Write Residue theorem and evaluate $\int_C \frac{1-2z}{z(z-1)(z-2)} dz$                                                              | 6 Marks  | L2 | CO2 | PO1 |
|    | b) | where C is the circle $ z  = 1.5$ by Residue theorem.<br>Evaluate $\int_0^\infty \frac{\cos ax}{x^2 + 1} dx$ by applying Calculus of | 6 Marks  | L3 | CO2 | PO2 |
|    |    | Residues. (OR)                                                                                                                       |          |    |     |     |
| 10 |    | By Integrating around a Unit circle, evaluate                                                                                        | 12 Marks | L3 | CO2 | PO2 |
|    |    | $\int_0^{2\pi} \frac{\cos 3\theta}{5 - 4\cos \theta} \ d\theta.$                                                                     |          |    |     |     |

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 ]

| Т  | Time: 3 hours |                                                                                                                                                                                                                                                                                      |                     |          |     |            |
|----|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------|-----|------------|
|    |               |                                                                                                                                                                                                                                                                                      |                     |          |     |            |
|    |               |                                                                                                                                                                                                                                                                                      |                     |          |     |            |
| 1. | a)            | Write a short notes on :                                                                                                                                                                                                                                                             | 6 Marks             | L1       | CO1 | PO1        |
|    | b)            | i) Implicit line joining. ii) Explicit line joining.<br>Define variable. Explain identifier rules.                                                                                                                                                                                   | 6 Marks             | L1       | CO1 | PO1        |
| 2  | a)            | (UN)<br>Design an algorithm to print first N Eibonacci terms                                                                                                                                                                                                                         | 6 Marks             | 13       | CO1 | PO2        |
| ۷. | 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<br>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, $452 \rightarrow 32$ .                                                                            | 6 Marks             | L3       | CO1 | PO2        |
| 5  | 2)            | Compass a nuther seriet to perform matrix multiplication                                                                                                                                                                                                                             | 6 Mortes            | т 2      | CO1 | DOJ        |
| 5. | a)<br>b)      | Write a python script to perform matrix multiplication.<br>Write a python script to count the number of vowels, consonants<br>and so on<br>Expected Output:<br>Enter a line of string: adfslkj34 34lkj34334lk<br>Vowels: 1<br>Consonants: 11<br>Digits: 9<br>White spaces: 1<br>(OR) | 6 Marks             | L3<br>L3 | COI | PO2<br>PO3 |
| 6  | a)            | Define List Explain different operations we can perform on the                                                                                                                                                                                                                       | 6 Marks             | L2       | CO1 | PO1        |
| 0. | )             | list with an example.                                                                                                                                                                                                                                                                | 0 10100110          |          | 001 | 101        |
|    | b)            | Write a python script to implement Stack Operations.                                                                                                                                                                                                                                 | 6 Marks             | L3       | CO2 | PO2        |
| 7. | a)            | Illustrate following file handling functions with an example program.<br>i) open() ii) read()                                                                                                                                                                                        | 6 Marks             | L2       | CO2 | PO1        |
|    | 1.)           | iii) readline() iv) readlines()                                                                                                                                                                                                                                                      | $(\mathbf{M}^{-1})$ | 1.2      | 002 |            |
|    | D)            | (OR)                                                                                                                                                                                                                                                                                 | o marks             | L2       | 02  | PUI        |

| 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 |
| 9.  | a) | Create a data frame. It contains students' subject wise marks.<br>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 |
| 10  | a) | Consider data frame contains student marks information. Write a                                                                    | 6 Marks | 1.3 | $CO^2$ | PO3 |
| 10. | u) | python script to display student details whose marks <60.                                                                          | 0 marks | 25  | 002    | 105 |
|     | b) | Write a python script to print information and frequency counts of a data set.                                                     | 6 Marks | L3  | CO2    | PO2 |

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(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]

| Т  | Time: 3 hours<br>Answer One Question from each Unit<br>All questions carry equal marks |                                                                                                                                                 |           |    |          | 60         |
|----|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----|----------|------------|
|    |                                                                                        | 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<br>PO5 |
|    |                                                                                        | (OR)                                                                                                                                            |           |    |          |            |
| 2. | a)                                                                                     | Illustrate different types of spread footings.                                                                                                  | 6 Marks   | L3 | CO1      | PO1<br>PO2 |
|    | b)                                                                                     | Define Arches. Write about different types of Arches.                                                                                           | 6 Marks   | L1 | CO1      | PO1        |
| 2  | a)                                                                                     | Driefte emploie different terres of aciety and in heilding                                                                                      | 6 Mortea  | 12 | $CO^{2}$ |            |
| 5. | a)                                                                                     | construction                                                                                                                                    | 0 IVIAIKS | LJ | 002      |            |
|    | b)                                                                                     | What is termite proofing? Which substance is used as termite proofing?                                                                          | 6 Marks   | L1 | CO2      | PO3<br>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<br>out reasons why selection of construction equipment is very<br>important. | 6 Marks   | L3 | CO2      | PO1<br>PO5 |
|    |                                                                                        | (UNIT-III)                                                                                                                                      |           |    |          |            |
| 5. | a)                                                                                     | List out the factors must be considered for selection of construction equipment.                                                                | 6 Marks   | L2 | CO3      | PO1<br>PO6 |
|    |                                                                                        |                                                                                                                                                 |           |    |          | PO8        |
|    | b)                                                                                     | Describe different types of Excavation equipment.                                                                                               | 6 Marks   | L2 | CO3      | PO1<br>PO2 |
|    |                                                                                        | (OR)                                                                                                                                            |           |    |          |            |
| 6. | a)                                                                                     | Explain about divisional organization structure in detail with an example structure.                                                            | 6 Marks   | L3 | CO3      | PO1<br>PO5 |
|    | b)                                                                                     | Write about the cost of owing the construction equipment and cost of operating the construction equipment.                                      | 6 Marks   | L1 | CO3      | PO1        |
|    |                                                                                        |                                                                                                                                                 |           |    |          |            |
| 7. | a)                                                                                     | Explain about different network techniques in construction project management.                                                                  | 6 Marks   | L3 | CO4      | PO1<br>PO5 |
|    | b)                                                                                     | What is a Work Breakdown Structure? How many types of Work Breakdown Structures are there?                                                      | 6 Marks   | L1 | CO4      | PO1        |
|    |                                                                                        |                                                                                                                                                 |           |    |          |            |

SVEC-19

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|         |

[ax. Marks: 60

9.

| 8. | a)       |                                                        | Time-Estima                              | tes (in weeks)                                      |                                   | 8 Marks            | L5       | CO4        | PO1                       |
|----|----------|--------------------------------------------------------|------------------------------------------|-----------------------------------------------------|-----------------------------------|--------------------|----------|------------|---------------------------|
|    |          | Activity                                               | Preceding<br>Activity                    | Most<br>optimistic<br>time (a)                      | Most likely<br>time (m)           |                    |          |            | PO2<br>PO5                |
|    |          | Α                                                      | None                                     | 2                                                   | 4                                 |                    |          |            | POIT                      |
|    |          | В                                                      | None                                     | 10                                                  | 12                                |                    |          |            |                           |
|    |          | С                                                      | А                                        | 8                                                   | 9                                 |                    |          |            |                           |
|    |          | D                                                      | A                                        | 10                                                  | 15                                |                    |          |            |                           |
|    |          | Е                                                      | Α                                        | 7                                                   | 7.5                               |                    |          |            |                           |
|    |          | F                                                      | B, C                                     | 9                                                   | 9                                 |                    |          |            |                           |
|    |          | G                                                      | D                                        | 3                                                   | 3.5                               |                    |          |            |                           |
|    |          | Н                                                      | E, F, G                                  | 5                                                   | 5                                 |                    |          |            |                           |
|    |          | Dra                                                    | w the PERT net                           | work for the pro-                                   | iect                              |                    |          |            |                           |
|    | b)       | Explain Bar of management.                             | charts or Gant                           | t chart techni                                      | que in project                    | 4 Marks            | L3       | CO4        | PO1<br>PO5                |
|    |          |                                                        |                                          | UNIT-                                               |                                   |                    |          |            |                           |
| 9. | a)       | Differentiate CP                                       | M and PERT me                            | ethods.                                             |                                   | 6 Marks            | L3       | CO5        | PO1<br>PO5                |
|    | b)       | Determine the t<br>diagram and                         | total float, free<br>d find o            | float for the for<br>but the 5                      | llowing network<br>critical path. | 6 Marks            | L5       | CO5        | PO1<br>PO2<br>PO5         |
| 10 | a)<br>b) | Define and form<br>Determine the t<br>diagram and find | total float, free doubt the critical $2$ | (OR)<br>FT, LST and LF<br>float for the fo<br>path. | T.<br>llowing network             | 6 Marks<br>6 Marks | L1<br>L5 | CO5<br>CO5 | PO1<br>PO1<br>PO5<br>PO11 |



(P) (P) (P) Time: 3 hours

### 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 ]

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 $1.5$ mm and the shaft rotates at 150 r n m                                                                      | 6 Marks | L4  | CO1        | PO1<br>PO4<br>PO5<br>PO10 |
|----|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|------------|---------------------------|
|    | b) | Calculate the density, specific weight and weight of one litre of Petrol of specific gravity = $0.7$ .                                                                                                                                                                                                        | 6 Marks | L3  | CO1        | PO1<br>PO2<br>PO5<br>PO10 |
|    |    | (OR)                                                                                                                                                                                                                                                                                                          |         |     |            |                           |
| 2. | a) | A plate $(2m \times 2m)$ , 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<br>PO2<br>PO4<br>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<br>PO4<br>PO5<br>PO10 |
|    |    |                                                                                                                                                                                                                                                                                                               |         |     |            | 1010                      |
| •  | `` |                                                                                                                                                                                                                                                                                                               |         | x 0 | <b>a a</b> | <b>DO1</b>                |
| 3. | a) | A stream function is given by $\Psi = 5x-6y$ . Calculate the velocity<br>components and also magnitude and direction of the resultant<br>velocity at any point.                                                                                                                                               | 6 Marks | L3  | CO2        | POI<br>PO2<br>PO4<br>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<br>PO4<br>PO5<br>PO10 |
|    |    |                                                                                                                                                                                                                                                                                                               |         |     |            |                           |
|    |    | D = 50  cm                                                                                                                                                                                                                                                                                                    |         |     |            |                           |
|    |    | V = 4  m/sec                                                                                                                                                                                                                                                                                                  |         |     |            |                           |
|    |    | D = 20  cm                                                                                                                                                                                                                                                                                                    |         |     |            |                           |

(OR)

SVEC-19

| 4. | a) | The velocity vector in a fluid flow is given                                                                                                                                                                                                                                                                                                                     | 6 Marks | L4 | CO2 | PO1                                     |
|----|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----|-----|-----------------------------------------|
|    | b) | $V = 4x^3 \overline{i} - 10x^2 y \overline{j} + 2t \overline{k}$ . Find the velocity and acceleration of<br>a fluid particle at (2, 1, 3) at time t = 1.<br>Derive Force exerted by a flowing fluid on a pipe-bend using                                                                                                                                         | 6 Marks | L3 | CO3 | PO5<br>PO10<br>PO1                      |
|    | -) | Impulse- momentum equation.                                                                                                                                                                                                                                                                                                                                      |         |    |     | 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 <sub>d</sub> is 0.97 and atmospheric pressure head = 10.3m of water.                        | 6 Marks | L4 | CO3 | PO1<br>PO4<br>PO5<br>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 $0.981 \text{ N/cm}^2$ . 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<br>PO2<br>PO5<br>PO10               |
| 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<br>PO2<br>PO4<br>PO10               |
|    | b) | Water flows through a 100mm diameter pipe with a velocity of $0.015$ m/sec. If the kinematic viscosity of water is $1.13 \times 10^{-6}$ m <sup>2</sup> /sec, find the friction factor of the pipe material.                                                                                                                                                     | 6 Marks | L4 | CO4 | PO1<br>PO2<br>PO5<br>PO10               |
|    |    | UNIT-IV                                                                                                                                                                                                                                                                                                                                                          |         |    |     |                                         |
| 7. | a) | Describe Reynold's experiment and mention features of Laminar flow.                                                                                                                                                                                                                                                                                              | 6 Marks | L2 | CO5 | PO1<br>PO2                              |
|    | b) | Calculate the pressure gradient along flow, average velocity and discharge of an oil of viscosity 0.02Ns/m <sup>2</sup> 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<br>PO2<br>PO4<br>PO5<br>PO10        |
| 8. | a) | Derive an expression for Hagen Poiseuille formula.                                                                                                                                                                                                                                                                                                               | 6 Marks | L3 | CO5 | PO1                                     |
|    | b) | A Crude Oil of viscosity 0.97 poise and relative density 0.9 is<br>flowing through a horizontal circular pipe of diameter 100mm<br>and of length 10m. Calculate the difference of pressure at the two<br>ends of the pipe, if 100 kg of oil is collected in a tank in 30<br>seconds.                                                                             | 6 Marks | L4 | CO5 | PO2<br>PO1<br>PO2<br>PO4<br>PO5<br>PO10 |

#### UNIT-V 9. A model of 1.0m wide and 5.5m long rectangular weir is to be 6 Marks CO6 PO1 L4 a) built over a river. The average depth of water in the river is 4m. PO2 The model which has a scale ratio of 1:36 was tested for velocity PO4 of flow of 0.5m/s in the laboratory. It was found that the force **PO10** acting on the model was 2.5N and the height of the standing wave was 40mm. Determine prototype of corresponding speed and force acting. b) A 1.0m log model of a ship is towed at a speed of 81cm/s in a 6 Marks L4 CO6 PO1 towing tank 64m long does this correspond to find out the speed PO2 of the ship. PO5 **PO10** (**OR**) 10 The resisting force of a supersonic plane during flight can be 12 Marks CO6 L4 PO1 considered as dependent on the length of the aircraft L, velocity PO2 V, viscosity $\mu$ , mass density $\rho$ , bulk modulus K. Express the PO4 fundamental relationship between resisting force and these PO5 variables. **PO10**

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

# **MECHANICS OF SOLIDS**

|    |         | [ Civil Engineering ]                                                                                                                                                                                                                                                                                                                            |         |      |          |                          |
|----|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------|----------|--------------------------|
| ,  | Time: 3 | 3 hours                                                                                                                                                                                                                                                                                                                                          |         | Max. | Marks: ( | 50                       |
|    |         | Answer One Question from each Unit                                                                                                                                                                                                                                                                                                               |         |      |          |                          |
|    |         | All questions carry equal marks                                                                                                                                                                                                                                                                                                                  |         |      |          |                          |
|    |         | UNIT-I                                                                                                                                                                                                                                                                                                                                           |         |      |          |                          |
| 1. | a)      | Analyze a simply supported beam with uniformly varying load<br>with maximum intensity at the mid span, draw the Shear force<br>and Bending moment diagrams and also find the maximum<br>Bending moment.                                                                                                                                          | 5 Marks | L4   | CO1      | PO1<br>PO2<br>PO5        |
|    | b)      | <ul> <li>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.</li> <li>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.</li> </ul> | 7 Marks | L4   | CO1      | PO1<br>PO2<br>PO4<br>PO5 |
| 2. | a)      | A cantilever beam 5m long carries concentrated loads of 30kN,<br>40kN and 50 KN at distances of 1.5m, 3m and 4.5m from the<br>fixed end. In addition to this the beam carries a uniformly<br>distributed load of 10kN/m over the entire length of the beam.<br>Analyze the beam and draw the Shear Force diagram and<br>Bending moment diagram   | 6 Marks | L4   | CO1      | PO1<br>PO2<br>PO5        |
|    | b)      | Analyze the given beam and draw the Shear Force diagram and<br>Bending moment diagram for the beam shown below .<br><sup>6</sup> kN <sup>8</sup> kN <sup>3</sup> kN/m                                                                                                                                                                            | 6 Marks | L4   | CO1      | PO1<br>PO2<br>PO5        |



- 3.The cross-section of an I-beam is shown in the figure. The Shear12 MarksL4CO1PO1force at the section is50kN. Analyze the beam and calculatePO2Shear stress distribution diagram. All dimensions are in 'mm'.PO4
  - 8 120mm 10 8 - 230mm - 150 - 150 - 10

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<br>PO2<br>PO4                |
|    | b) | A laminated wood beam 10cm wide and 15cm deep is made up of three 5cm $\times$ 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 <sup>2</sup> , find the safe concentrated load that the beam may carry at its centre.                        | 6 Marks  | L5         | CO2          | PO1<br>PO2<br>PO4<br>PO6<br>PO10 |
|    |    | UNIT-III                                                                                                                                                                                                                                                                                                                                                                  |          |            |              |                                  |
| 5. | a) | Derive torsional equation for a circular shaft with neat sketch.                                                                                                                                                                                                                                                                                                          | 6 Marks  | L4         | CO3          | PO1<br>PO2<br>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 0.51 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<br>PO2<br>PO4<br>PO5         |
| r. |    | (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 <sup>2</sup> . Modulus of rigidity of the spring wire material is 80GN/m <sup>2</sup> . What is the maximum axial load the spring can carry?         | 12 Marks | L4         | CO3          | PO1<br>PO2<br>PO5<br>PO10        |
| _  |    |                                                                                                                                                                                                                                                                                                                                                                           |          | <b>.</b> . | <b>G ( )</b> | DOI                              |
| 7. | a) | State of stress at a point in a material is as shown in the figure.<br>Determine:<br>i) Principal stresses.<br>iii) Maximum shear stress.<br>iii) Plane of maximum shear stress.<br>iv) The resultant stress on the plane of maximum shear stress.                                                                                                                        | 6 Marks  | L4         | CO4          | PO1<br>PO2<br>PO5<br>PO10        |
|    |    | 100 N/mm<br>↑                                                                                                                                                                                                                                                                                                                                                             |          |            |              |                                  |
|    |    | 75 N/mm <sup>2</sup>                                                                                                                                                                                                                                                                                                                                                      |          |            |              |                                  |
|    | 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<br>PO2<br>PO5<br>PO10        |

(OR)

| 8. | a) | Explain briefly Maximum Principal Strain theory                                                                                                                                                                                                                                                                                  | 6 Marks | L4         | CO5 | PO1<br>PO2<br>PO3<br>PO10 |
|----|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------------|-----|---------------------------|
|    | b) | At a point in a stressed material, the three principal stresses are 90N/mm <sup>2</sup> (tensile), 60N/mm <sup>2</sup> (tensile) and 30N/mm <sup>2</sup> (compressive). Find the factor of safety if the yield stress is 230N/mm <sup>2</sup> and $v = 0.3$ by the principal stress, shear stress and principal strain theories. | 6 Marks | L4         | CO5 | PO1<br>PO2<br>PO3         |
| 0  | `  |                                                                                                                                                                                                                                                                                                                                  |         | <b>T</b> 4 | 000 | DO 1                      |
| 9. | a) | a column.                                                                                                                                                                                                                                                                                                                        | 6 Marks | L4         | CO6 | PO1<br>PO2<br>PO5         |
|    | b) | Derive the expression for crippling load of a column when both<br>the ends of the column are hinged.                                                                                                                                                                                                                             | 6 Marks | L4         | CO6 | PO1<br>PO2<br>PO5         |
|    |    | (OR)                                                                                                                                                                                                                                                                                                                             |         |            |     |                           |
| 10 | a) | Compare the ratio of the strength of a solid steel column to that<br>of a hollow of the same cross section areas. Assume the internal<br>diameter of the hollow column to be three-fourths of the external<br>diameter. Both the columns have the same length and are pinned<br>at the onds                                      | 6 Marks | L4         | CO6 | PO1<br>PO2<br>PO3<br>PO10 |
|    | b) | A column is of rectangular shape of size 300mm x 200mm carries Compressive load of 25kN. Factor of safety is 3 and $E = 2.1 \times 10^5 \text{N/mm}^2$ . Determine the length of the column whose one end is hinged and the other end is free.                                                                                   | 6 Marks | L4         | CO6 | PO1<br>PO2<br>PO3<br>PO10 |

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PO4

# SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

# SURVEYING

| Civil I | Lnginee | ring |
|---------|---------|------|
|---------|---------|------|

| T' |        |                                                                                                                                                                                                                                                                                                                                                                                                                 |         | Mar Marker (0 |          |                          |  |
|----|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------------|----------|--------------------------|--|
| 1  | ime: 3 | hours<br>Answer One Question from each Unit<br>All questions carry equal marks                                                                                                                                                                                                                                                                                                                                  |         | Max.          | Marks: ( | 90                       |  |
| 1. | a)     | What are the sources of error in chaining? What precautions would you take to guard against them?                                                                                                                                                                                                                                                                                                               | 5 Marks | L4            | CO1      | PO1<br>PO2<br>PO5        |  |
|    | b)     | Below are the bearings observed in a traverse survey conducted<br>with a prismatic compass at a place where local attraction was<br>suspected.<br>Line F.B B.B<br>AB $191^{0}45^{1}$ $13^{0}0^{1}$<br>BC $39^{0}30^{1}$ $222^{0}30^{1}$<br>CD $22^{0}15^{1}$ $200^{0}30^{1}$<br>DE $242^{0}45^{1}$ $62^{0}45^{1}$<br>EA $330^{0}15^{1}$ $147^{0}45^{1}$                                                         | 7 Marks | L4            | CO1      | PO1<br>PO2<br>PO4<br>PO5 |  |
|    |        | At what stations do you suspect local attraction? Find the corrected bearings of the lines and also calculate the included angles.                                                                                                                                                                                                                                                                              |         |               |          |                          |  |
| 2. | a)     | (OR) Discuss in detail about two methods of ranging.                                                                                                                                                                                                                                                                                                                                                            | 7 Marks | L4            | CO1      | PO1<br>PO2<br>PO5        |  |
|    | b)     | Discuss how you would overcome the chaining problem if there<br>are obstacles on the chain line. Assuming that:<br>i) Chaining around the obstacle is possible.<br>ii) Chaining around the obstacle is not possible.<br><b>UNIT-II</b>                                                                                                                                                                          | 5 Marks | L4            | CO1      | PO1<br>PO2<br>PO5        |  |
| 3. | a)     | The following consecutive readings were taken with a dumpy<br>level, the instrument having been moved after the second, fourth<br>and eighth readings:<br>0.875, 1.235, 2.310, 1.385, 2.930, 3.125, 4.125, 0.210, 1.875,<br>2.030, 3.765<br>The first reading was taken with the staff held upon a benchmark<br>of elevation 132.135. Tabulate the page of field book and<br>calculate the levels of the points | 7 Marks | L4            | CO2      | PO1<br>PO2<br>PO4        |  |
|    | b)     | Describe about the uses of contours with the help of neat sketches.                                                                                                                                                                                                                                                                                                                                             | 5 Marks | L4            | CO2      | PO1<br>PO2<br>PO4        |  |
| 4. | a)     | <b>(OR)</b><br>Discuss about the characteristics of contours with the help of neat sketches.                                                                                                                                                                                                                                                                                                                    | 6 Marks | L4            | CO2      | PO1<br>PO2               |  |
|    | b)     | Explain about any two methods of contouring with sketches.                                                                                                                                                                                                                                                                                                                                                      | 6 Marks | L4            | CO2      | PO4<br>PO1<br>PO2        |  |

|    |    | UNIT-III                                                                                                                                                                                                                                                                                                                                                       |          |    |     |                           |
|----|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----|-----|---------------------------|
| 5. | a) | Demonstrate the procedure of measuring horizontal angle by repetition method.                                                                                                                                                                                                                                                                                  | 6 Marks  | L4 | CO3 | PO1<br>PO2<br>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<br>PO2<br>PO4<br>PO5  |
| 6. | a) | ( <b>OR</b> )<br>Explain the principle of tangential method of tachometric survey.                                                                                                                                                                                                                                                                             | 6 Marks  | L4 | CO3 | PO1<br>PO2<br>PO5<br>PO10 |
|    | b) | Draw a neat sketch of a vernier theodolite and explain the functions of the various parts.                                                                                                                                                                                                                                                                     | 6 Marks  | L4 | CO3 | PO1<br>PO2<br>PO4         |
| 7. | a) | The following perpendicular offsets were taken at 10m intervals<br>from a survey line to an irregular boundary line.<br>2.30, 3.75, 4.50, 6.75, 5.25, 7.30, 8.95, 8.25, 5.55m.<br>Calculate the area included between the survey line, the irregular<br>boundary line and the first and last offsets by:<br>i) Average-ordinate rule.<br>ii) Trapezoidal rule. | 6 Marks  | L4 | CO4 | PO1<br>PO2<br>PO5<br>PO10 |
|    | b) | A railway embankment 500m long is 9m wide at the formation<br>level and has the side slope 2 to 1. The ground levels at every<br>100m along the centre line are as under.<br>$\begin{array}{r rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$                                                                                                                             | 6 Marks  | L4 | CO4 | PO1<br>PO2<br>PO5<br>PO10 |
| 8. |    | Explain in detail about any two methods of setting of simple curves with sketches.                                                                                                                                                                                                                                                                             | 12 Marks | L4 | CO5 | PO1<br>PO2<br>PO5         |
| 9. | a) | What are the precautions to be considered while using a total station?                                                                                                                                                                                                                                                                                         | 6 Marks  | L4 | CO6 | PO1<br>PO2<br>PO5         |
|    | b) | Write a note on interior drone surveying and exterior drone surveying.                                                                                                                                                                                                                                                                                         | 6 Marks  | L4 | CO6 | PO1<br>PO2<br>PO5         |
| 10 | a) | (OR)<br>Discuss about the good practices in using total station.                                                                                                                                                                                                                                                                                               | 6 Marks  | L4 | CO6 | PO1<br>PO2<br>PO5         |
|    | b) | Explain the principles of EDM with an example.                                                                                                                                                                                                                                                                                                                 | 6 Marks  | L4 | CO6 | PO1<br>PO2<br>PO5         |
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### II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

### **ELECTRICAL MACHINES-I**

[Electrical and Electronics Engineering]

| Time: 3 hours |                                 | ours                                                                                                                                                                                                                                                                                                                                              | s       |            |     | 60  |  |  |  |  |
|---------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------------|-----|-----|--|--|--|--|
|               |                                 | Answer One Question from each Unit                                                                                                                                                                                                                                                                                                                |         |            |     |     |  |  |  |  |
|               | All questions carry equal marks |                                                                                                                                                                                                                                                                                                                                                   |         |            |     |     |  |  |  |  |
|               |                                 |                                                                                                                                                                                                                                                                                                                                                   |         |            |     |     |  |  |  |  |
| 1.            | a)                              | Explain the constructional features of a DC machine with the                                                                                                                                                                                                                                                                                      | 6 Marks | L1         | CO1 | PO1 |  |  |  |  |
|               | b)                              | An 8 pole, DC shunt generator with 770 wave connected<br>armature conductors and running at 500 r.p.m supplied a load of<br>12.5 $\Omega$ resistance at a terminal voltage of 250V. Armature<br>resistance is 0.24 $\Omega$ and field resistance is 250 $\Omega$ . Find armature<br>current and induced EMF. Also find the flux per pole.<br>(OR) | 6 Marks | L3         | CO1 | PO4 |  |  |  |  |
| 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.<br>The resistances are $R_a=0.05\Omega$ , $R_{se}=0.064\Omega$ and $R_{ah}=250\Omega$ . The<br>brush contact drop is 1 volt/brush. Find the induced EMF and<br>Armature current when the machine connected as:<br>i) long shunt.<br>ii) short shunt.<br>UNIT-II                      | 6 Marks | L3         | CO1 | PO2 |  |  |  |  |
| 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.<br>Supplies a current of 150A. If the brushes are given a lead of 10 <sup>°</sup> .<br>Calculate demagnetizing amperes turns/pole and cross<br>magnetising ampere turns/pole.                                                                                                        | 6 Marks | L3         | CO1 | PO1 |  |  |  |  |
| 1             | a)                              | ( <b>UR</b> )<br>What is commutation? Explain the methods of improving                                                                                                                                                                                                                                                                            | 6 Marks | Ι <i>Λ</i> | CO1 | PO3 |  |  |  |  |
| 4.            | a)                              | commutation.                                                                                                                                                                                                                                                                                                                                      | 0 Marks | L4         | COI | 105 |  |  |  |  |
|               | 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 $R_a = 0.2 \Omega$ and $R_{sh} = 250 \Omega$ . 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 |  |  |  |  |
| 6             | a)                              | (UK)<br>Derive torque equation of a DC motor from first principles                                                                                                                                                                                                                                                                                | 6 Marko | Ţ 1        | CO3 | P∩1 |  |  |  |  |
| 0.            | a)<br>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 $3\Omega$ .                          | 6 Marks | L1<br>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       | 6 Marks | L3 | CO4 | PO4 |
|     |    | transformer. Write the formulae.                                 |         |    |     |     |
|     | b) | A 15KVA, 2200/220V, 50Hz transformer gave the following          | 6 Marks | L3 | CO4 | PO2 |
|     |    | 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.                |         |    |     |     |
|     |    | UNIT-V                                                           |         |    |     |     |
| 9.  | a) | Give the merits and demerits of star delta connected three phase | 6 Marks | L2 | CO4 | PO1 |
|     |    | transformers. Explain the function.                              |         |    |     |     |
|     | 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      | 6 Marks | L2 | CO4 | PO1 |
|     |    | transformers. Explain the function.                              |         |    |     |     |
|     | b) | Illustrate the various types of three phase transformers         | 6 Marks | L1 | CO4 | PO1 |
|     |    | connections.                                                     |         |    |     |     |
|     |    |                                                                  |         |    |     |     |
|     |    |                                                                  |         |    |     |     |

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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<br>All questions carry equal marks                                                                                                                              |          |                |             |              |  |
|               |    |                                                                                                                                                                                                    |          |                |             |              |  |
| 1.            | a) | State and explain Gauss's law and derive point form of Gauss's law also calculate <b>E</b> due to infinite surface charge distribution                                                             | 6 Marks  | L2             | CO1         | PO2          |  |
|               | b) | A Uniform volume charge density of $80\mu$ C/m <sup>3</sup> is present<br>throughout the region 8mm < r < 10mm. Let $\rho_v = 0$ for<br>0 < r < 8mm.                                               | 6 Marks  | L3             | CO1         | PO2          |  |
|               |    | <ul><li>i) Find the total charge inside the spherical surface r = 10 mm.</li><li>ii) Find D<sub>r</sub> at r = 10mm.</li></ul>                                                                     |          |                |             |              |  |
|               |    | (OR)                                                                                                                                                                                               |          |                |             |              |  |
| 2.            | a) | Derive an expression for Electric field intensity (E) due to infinite line charge distribution.                                                                                                    | 6 Marks  | L2             | CO1         | PO1          |  |
|               | b) | Find electric field intensity at a point $(\mathbf{r}, \boldsymbol{\theta}, \boldsymbol{\phi})$ , 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<br>under static condition? Explain.                                                                                               | 5 Marks  | L2             | CO1         | PO2          |  |
|               | b) | Assume that two homogeneous isotropic dielectric media with                                                                                                                                        | 7 Marks  | L3             | CO1         | PO2          |  |
|               |    | dielectric constants $\mathbf{\epsilon}_{r1} = 3$ and $\mathbf{\epsilon}_{r2} = 2$ are separated by the                                                                                            |          |                |             |              |  |
|               |    | xy-plane. At a common point $E_1=a_x-5a_y-4a_z$ . Find $E_2$ , $D_2$ , $\alpha_1$ and                                                                                                              |          |                |             |              |  |
|               |    | $\alpha_2$ .                                                                                                                                                                                       |          |                |             |              |  |
|               |    | (OR)                                                                                                                                                                                               |          |                | ~~ 4        |              |  |
| 4.            | a) | Write the capacitance formula for a parallel-plate capacitor of area S whose plates are separated by a medium of dielectric                                                                        | 6 Marks  | L2             | COI         | PO1          |  |
|               | b) | constant $\boldsymbol{\varepsilon}$ and thickness $\boldsymbol{d}$ .                                                                                                                               | 6 Marka  | 1 2            | CO1         |              |  |
|               | U) | interface between a conductor and a dielectric with permittivity $\boldsymbol{\varepsilon}$ .                                                                                                      | 0 Marks  | L2             | COI         | FUI          |  |
| 5             | a) | An infinitally long straight solid nonmagnetic conductor with a                                                                                                                                    | 6 Marka  | 12             | $CO^{2}$    | DOJ          |  |
| 5.            | a) | circular cross section of radius <b>b</b> carries a steady current <b>I</b>                                                                                                                        | 0 WIAIKS | LZ             | 02          | FU2          |  |
|               |    | Determine the magnetic flux density both inside and outside the conductor                                                                                                                          |          |                |             |              |  |
|               | b) | Which postulate of magnetostatics denies the existence of isolated magnetic charges? Explain.                                                                                                      | 6 Marks  | L1             | CO2         | PO2          |  |
| ~             | `` | (OR)                                                                                                                                                                                               |          | <b>T A</b>     | <b>GO A</b> | <b>D O A</b> |  |
| 6.            | a) | Find the magnetic flux density at a point on the axis of a circular<br>loop of radius <b>b</b> that carries a direct current <b>I</b> .                                                            | 6 Marks  | L2             | CO2         | PO2          |  |
|               | b) | A thin ring of radius 5cm is placed on plane $z = 1$ cm so that its                                                                                                                                | 6 Marks  | L2             | CO2         | PO2          |  |
|               |    | centre is at $(0, 0, 1)$ cm. If the ring carries 50mA along $\mathbf{a}_{\phi}$ , find <b>H</b> at $(0, 0, -1)$ cm.                                                                                |          |                |             |              |  |

## (UNIT-IV)

| 7. | a)  | A conducting filamentary triangle joins A (3, 1, 1), B (5, 4, 2)<br>and C (1, 2, 4). The segment AB carries a current of 0.2 A in the<br>$\mathbf{a}_{AB}$ direction. In the presence of magnetic field<br>$B = 0.2a_x - 0.1a_y + 0.3a_z T$ . | 6 Marks   | L2 | CO2 | PO2 |
|----|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----|-----|-----|
|    |     | <ul> <li>i) Find the force on segment BC.</li> <li>ii) Find the torque on the loop about an origin at A</li> </ul>                                                                                                                            |           |    |     |     |
|    | 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 <sub>2</sub> is placed parallel to an                                                                                                                                                                   | 7 Marks   | L2 | CO2 | PO4 |
|    | - ) | infinitely long filementary wire corrying current L og shown                                                                                                                                                                                  |           |    |     |     |
|    |     | halary Character the force comparisoned by the loop is given by                                                                                                                                                                               |           |    |     |     |
|    |     | below. Snow that the force experienced by the loop is given by                                                                                                                                                                                |           |    |     |     |
|    |     | $F = -\frac{\mu_0 I_1 I_2 b}{2\pi} \left[ \frac{1}{\rho_0} - \frac{1}{\rho_0 + a} \right] a_\rho N$                                                                                                                                           |           |    |     |     |
|    |     |                                                                                                                                                                                                                                               |           |    |     |     |
| 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 povnting theorem                                                                                                                                                                                                            | 6 Marks   | L2 | CO3 | PO2 |
|    | 0)  | (OR)                                                                                                                                                                                                                                          | 0 IVIUIRS | 22 | 005 | 102 |
| 10 | a)  | In free space $F = 20\cos(0.t-50)a V/m$ find                                                                                                                                                                                                  | 6 Marks   | L2 | CO3 | PO4 |
| 10 | u)  | In nee space $E = 20003 (wr - 50_x)u_y r m$ , find                                                                                                                                                                                            | 0 IVIUIRD | 22 | 005 | 101 |
| •  |     | i) $J_d$ ii) H iii) $\omega$                                                                                                                                                                                                                  |           |    |     |     |
|    | b)  | State and explain faraday's laws of electromagnetic induction.                                                                                                                                                                                | 6 Marks   | L2 | CO3 | PO2 |
|    |     |                                                                                                                                                                                                                                               |           |    |     |     |

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Time: 3 hours

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

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

#### SIGNALS AND NETWORKS

#### [Electrical and Electronics Engineering]

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. 6 Marks L3 CO1 PO2 If the signal is periodic find its fundamental period. i)  $x(n) = 3\cos(10n + \pi/6)$ 

ii) 
$$x(n) = e^{(j\pi n/2)}$$

b) Consider the following signal and sketch for the given x(-2t+1). 6 Marks L3 CO1 PO2



2. a) Distinguish between Energy and Power signals.

b) Determine and sketch y(t) = x(t) + x(2 - t) where 8 Marks L3 CO1 PO2 x(t) = u(t + 2) - u(t - 1). Express y(t) in terms of step functions.

#### UNIT-II )

3. a) State any four properties of fourier series .
b) Find the fourier series expansion for the waveform shown in 8 Marks L3 CO2 figure.



The waveform is 
$$x(t) = \begin{cases} -\frac{At}{\pi} & \text{for } -\pi \leq t \leq 0 \\ \frac{At}{\pi} & \text{for } 0 \leq t \leq \pi \end{cases}$$
(OR)

- 4. a) Check the following signals  $\cos n\omega_0 t$  and  $\cos m\omega_0 t$  are 4 Marks L2 CO2 PO2 Orthogonal or not.
  - b) The given rectangular pulse is  $x(t) = \begin{cases} 1, & |t| < T_1 \\ 0, & |t| < T_1 \end{cases}$ . Find the fourier transform . 8 Marks L3 CO2 PO2

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PO1

PO1

PO2

4 Marks

L2

CO1

### (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 6 Marks L3 CO2 PO5  $X(s) = \frac{2s+1}{(s+1)(s^2+2s+2)}.$
- a) (OR) 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 6 Marks L3 CO2 PO2  $X[z] = \frac{2 - \frac{3}{2}z^{-1}}{1 - \frac{3}{2}z^{-1} + \frac{1}{2}z^{-2}} \quad for \ ROC \ |z| > 1.$

### UNIT-IV

7. a) An electrical circuit shown below has 6 Marks L3 CO3 PO2  $R = 1K\Omega$ ,  $L = 1\mu H$ ,  $C = 1\mu F$ .



- i) Find the system equation (ODE) which relates  $v_i(t)$  with  $v_0(t)$ .
- ii) Determine transfer function H(s).

6.

- iii) Draw magnitude response  $||H(j\omega)||$ .
- b) A signal  $v_i(t) = 10\cos(1000\pi t)$  Volts is applied to the circuit 6 Marks L3 CO3 PO5 shown in 7(a). Comment whether the signal is passed or stopped by the circuit.

#### (OR)

8. a)Differentiate RL and RC circuits4 MarksL2CO3PO1b)For the electrical network shown below, answer the following8 MarksL3CO3PO2



- 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 6 Marks L3 CO4 PO2 impedance  $z_{21}$  in ohms



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Write short notes on Z,Y,T and h parameters. b) 6 Marks L2 CO4 PO1 (OR) Write short notes on Transfer function and Driving point 6 Marks L3 a) CO4 PO2 function. Explain transmission (ABCD) parameters in detail. 6 Marks L1 CO4 PO1 b)

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## **ENGINEERING THERMODYNAMICS**

[Mechanical Engineering]

| Ti | me: 3 | hours<br>Answer One Question from each Unit<br>All questions carry equal marks                                                                                                                                             |            | Max      | . Marks: | 60  |
|----|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------|----------|-----|
|    |       |                                                                                                                                                                                                                            |            |          |          |     |
|    |       | 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 <sup>3</sup> and P is the Pressure in bar. Determine the work done when the volume changes from 3 to 6 m <sup>3</sup> | 6 Marks    | L3       | CO1      | PO2 |
|    |       | ( <b>OR</b> )                                                                                                                                                                                                              |            |          |          |     |
| 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:                                                                                                                              | 6 Marks    | L3       | CO1      | PO2 |
|    |       | Pressure 15 bar, internal energy 2700 kJ/kg, specific volume                                                                                                                                                               |            |          |          |     |
|    |       | 0.17 m <sup>3</sup> /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 <sup>3</sup> /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.                                                                                                                                                                                                       |            |          |          |     |
|    |       | 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                                                                                                                                                              | 6 Marks    | L3       | COI      | PO2 |
|    |       | 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.                                                                                                                                                                                                    |            |          |          |     |
| 4  | a)    | What is Clausius inequality? Explain the entropy principle                                                                                                                                                                 | 6 Marks    | L2       | CO1      | PO1 |
| 1. | b)    | A lump of steel of mass 8 kg at 1000 K is dropped in 80 kg of oil                                                                                                                                                          | 6 Marks    | L2<br>L3 | CO1      | PO2 |
|    | 0)    | at 300 K. Make calculations for the entropy change of steel, the                                                                                                                                                           | 0 11101110 | 20       | 001      | 10- |
|    |       | oil and the universe. Take specific heats of steel and oil as                                                                                                                                                              |            |          |          |     |
|    |       | 0.5 kJ/kg.K and 3.5 kJ/kg.K respectively.                                                                                                                                                                                  |            |          |          |     |
|    |       | (UNIT-III)                                                                                                                                                                                                                 |            |          |          |     |
| 5  | a)    | Define dryness fraction and explain the process of steam                                                                                                                                                                   | 6 Marks    | L2       | CO2      | PO2 |
| 0. | )     | generation (change of phase of water) at constant pressure. Show                                                                                                                                                           | 0 11101110 |          | 002      | 10- |
|    |       | the various stages on P-v and T-s diagrams.                                                                                                                                                                                |            |          |          |     |
|    | b)    | Wet steam at 20 bar pressure and 0.9 dryness fraction is heated                                                                                                                                                            | 6 Marks    | L3       | CO2      | PO2 |
|    |       | reversibly at constant pressure to a temperature of 300°C. Make                                                                                                                                                            |            |          |          |     |
|    |       | calculations for the work done, heat supplied and changes in                                                                                                                                                               |            |          |          |     |
|    |       | internal energy and entropy.                                                                                                                                                                                               |            |          |          |     |
|    |       | (OR)                                                                                                                                                                                                                       |            |          |          |     |

| 6. | a) | Derive the first and second Tds equations and set up the                             | 12      | L3 | CO1 | PO2 |
|----|----|--------------------------------------------------------------------------------------|---------|----|-----|-----|
|    |    | expression for the difference in heat capacities $c_p$ and $c_v$ . State             | Marks   |    |     |     |
|    |    | the significance of this expression.                                                 |         |    |     |     |
|    |    | UNIT-IV                                                                              |         |    |     |     |
| 7. | a) | Define the characteristic gas constant. How does it differ from                      | 6Marks  | L1 | CO3 | PO2 |
|    |    | universal gas constant. Write units for these constants.                             |         |    |     |     |
|    | 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                     | 6Marks  | L3 | CO3 | PO2 |
|    |    | components of a gas mixture consisting of 10 mass fractions of                       |         |    |     |     |
|    |    | air and I mass fractions of lighting gas. Take density of lighting                   |         |    |     |     |
|    |    | gas 0.5 kg/m <sup>3</sup> at 101325 N/m <sup>2</sup> pressure and 273 K temperature. |         |    |     |     |
|    |    | UNIT-V                                                                               |         |    |     |     |
| 9. | a) | Derive an expression for the thermal efficiency of Otto cycle                        | 6 Marks | L3 | CO4 | PO2 |
|    |    | with aid of P-v and T-s diagrams.                                                    |         |    |     |     |
|    | b) | The swept volume of a diesel engine working on dual cycle is                         | 6 Marks | L3 | CO4 | PO2 |
|    |    | 0.0053 m <sup>3</sup> and clearance volume is 0.00035 m <sup>3</sup> . The maximum   |         |    |     |     |
|    |    | pressure is 65 bar. Fuel injection ends at 5 per cent of the stroke.                 |         |    |     |     |
|    |    | The temperature and pressure at the start of the compression are                     |         |    |     |     |
|    |    | 80°C and 0.9 bar. Determine the air standard efficiency of the                       |         |    |     |     |
|    |    | cycle. Take $\gamma$ for all $-1.4$ .                                                |         |    |     |     |
| 10 | a) | (UK)<br>Explain the working of stirling and priceson evalues with the aid            | 6 Marka | τ2 | CO4 | DOJ |
| 10 | a) | of P-v and T-s diagrams.                                                             | 0 Marks | LJ | 004 | 102 |
|    | b) | In an air standard otto cycle engine, the temperature at the end of                  | 6 Marks | L3 | CO4 | PO2 |
|    |    | 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.                          |         |    |     |     |

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#### **KINEMATICS OF MACHINERY**

#### [Mechanical Engineering]

Time: 3 hours Max. Marks: 60 Answer One Question from each Unit All questions carry equal marks UNIT-I Explain the different types of kinematic pairs with examples. 1. a) 6 Marks L2 CO1 PO1 Explain any two inversions of a single slider crank chain with 6 Marks L2 CO1 b) PO1 neat sketch. (**OR**) 2. Define kinematic link. Describe types of links with example. 6 Marks L2 PO1 a) CO1 Explain the terms: b) 6 Marks L2 CO1 PO1 i) Degree of freedom. ii) Lower pair. iii) Higher pair. UNIT-II Describe the different approximate straight line motion 3. 12 Marks L2 CO<sub>2</sub> PO1 mechanisms with the help of a neat sketch. (**OR**) Explain the Ackerman steering gear mechanism with neat sketch. L2 CO3 PO1 4. 6 Marks a) Derive an expression for the ratio of angular velocities of the L3 CO3 b) 6 Marks PO1, shafts of a Hooke's joint. PO2 UNIT-III) Derive an expression for the length of path of contact in a pair of 5. 6 Marks L4 CO4 PO1, a) meshed spur gears. PO2 A pinion having 30 teeth drives a gear having 80 teeth. The PO1. b) 6 Marks L4 CO4 profile of the gear is Involute with 20<sup>o</sup> pressure angle, 12mm PO2, module and 10mm addendum. Find the length of path of contact, PO3 arc of contact and the contact ratio. (**OR**) 6. Explain the types of gear trains with neat sketch. 6 Marks L2 CO4 PO1, a) In an epicyclic gear train, an arm carries two gears A and B L4 b) 6 Marks CO4 PO1, having 40 and 50 teeth respectively. If the arm rotates at PO2. 200 r.p.m. in the anticlockwise direction about the centre of the PO<sub>3</sub> 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

### UNIT-IV)

7. Draw the profile of a cam operating a knife-edged follower 12 Marks L3 CO<sub>5</sub> PO1, having a lift of 30mm. The follower moves outwards with SHM PO2. during 150° of cam rotation and followed by dwell for 60°. The PO3 follower descends for the next 100° 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?

#### (OR)

direction, what will be the speed of gear B?

- A cam, with a minimum radius of 25mm, rotating clockwise at a 12 Marks L3 CO5 PO1, uniform speed is to be designed to give a roller follower, at the end of a valve rod, motion described below : PO3
  - i) To raise the valve through 50mm during 120<sup>o</sup> rotation of the cam.
  - ii) To keep the valve fully raised through next  $30^{\circ}$ .
  - iii) To lower the valve during next  $60^{\circ}$ .

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.

### UNIT-V

9. Explain the types of Instantaneous centres with neat sketch 6 Marks CO6 PO1. L2 a) b) Locate all the instantaneous centres of the slider crank 6 Marks L4 CO6 PO1, mechanism as shown in fig. The lengths of crank OB and PO2, connecting rod AB are 100mm and 400mm respectively. If the PO3 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.



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8.

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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### MANUFACTURING TECHNOLOGY

### [ Mechanical Engineering ]

| Т  | Time: 3 hours<br>Answer One Question from each Unit |                                                                                                      |         | Max. | Marks: ( | 50                |
|----|-----------------------------------------------------|------------------------------------------------------------------------------------------------------|---------|------|----------|-------------------|
|    |                                                     | An 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<br>PO2<br>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               |
| 0. | b)                                                  | Explain working of electro hydraulic forming with neat sketch.                                       | 6 Marks | L2   | CO3      | PO1               |
| 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               |
|    | ,                                                   |                                                                                                      |         |      |          |                   |
| 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               |
| 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               |

Time: 3 hours

SVEC-19

PO3 PO4

**PO1** 

PO2 PO3 PO4 PO6 PO7

PO1

**PO2** 

PO3 PO4

PO6

PO7

L4

CO<sub>2</sub>

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### STRENGTH OF MATERIALS [Mechanical Engineering]

Max. Marks: 60

Answer One Question from each Unit All questions carry equal marks

### UNIT-I

Draw and explain the stress-strain curve for a ductile material. 6 Marks L2 PO1 1. a) CO1 How the curve is different for a brittle material? PO<sub>2</sub> PO3 PO4 A solid uniform metal bar of diameter **D** and length **L** is hanging 6 Marks CO1 PO1 b) L3 vertically from its upper end. Obtain the total elongation of the **PO2** bar due to its own weight, if  $\gamma$  is the density and E is the Young's PO3 modulus of the material of the bar. PO4 (**OR**) 2. A steel rod ABCD 4.5m long and 25mm in diameter is subjected 6 Marks L4 CO1 PO1 a) to the forces as shown in figure. If the value of the young's **PO2** 

modulus for the steel is **200GPa**, determine its deformation.

$$60 \text{ kN} \leftarrow 1.5 \text{ m} \rightarrow 1.5 \text{ m}$$

| b) | A reinforced concrete column 300mm x 300mm has four                   | 6 Marks | L4 | CO1 | PO1 |
|----|-----------------------------------------------------------------------|---------|----|-----|-----|
|    | reinforcing bars of <b>20mm</b> diameter one in each corner. When the |         |    |     | PO2 |
|    | column is loaded with 600kN weight, find the stresses developed       |         |    |     | PO3 |
|    | in the concrete and steel. Take $E_s / E_c = 15$ .                    |         |    |     | PO4 |
|    | UNIT-II                                                               |         |    |     |     |

- 3. a) Explain the important relations between loading, shear force and 4 Marks L2 CO2 bending moment at a point or between two sections of a beam.
  - b) A cantilever **1.5m** long is loaded with a uniformly distributed 8 Marks 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.



#### (**OR**) A simply supported beam AB, 6m long is loaded as shown in 4 Marks L4 CO<sub>2</sub> PO1 4. a) figure. Construct the shear force and bending moment diagrams PO<sub>2</sub> for the beam and find the position and value of maximum PO3 bending moment. PO4 PO6 5 kN 2 kN/mPO7 4 kN/m D 1.5 m-·3 m · 6 m Define shear force and bending moment in beams and explain the PO1 8 Marks L2 CO<sub>2</sub> b) sign convention used. **PO2** PO3 PO4 PO6 PO7 UNIT-III) 5. a) List any 6 assumptions used in theory of bending. 4 Marks L1 CO<sub>2</sub> **PO1 PO2** PO3 PO4 PO<sub>6</sub> PO7 b) Determine the maximum uniformly distributed load, a simply 8 Marks L4 CO<sub>2</sub> PO1 supported 40cm deep and 20cm wide timber beam can carry over **PO2** a span of 4m. The maximum permissible bending stress for the PO<sub>3</sub> timber is $2N/mm^2$ . PO4 PO<sub>6</sub> PO7 (**OR**) Derive the bending equation and explain how to find the position 6. a) 6 Marks L5 CO<sub>2</sub> PO1 of neutral axis. PO2 PO3 PO4 PO6 PO7

b) A hollow steel pipe is of 150mm external diameter and 100mm 6 Marks L4 CO2 PO1 internal diameter. If the stresses in tension and compression do not exceed 150N/mm<sup>2</sup> then what longest length of it can be supported freely at its ends? Unit weight of steel is 78kN/m<sup>3</sup>.

PO7

| 7. | a) | Obtain relation for the Moment of resistance by a circular shaft subjected to a torque <b>T</b> .                                                                                                                                                                                                                                                                                                                               | 4 Marks  | L3         | CO3         | PO1<br>PO2<br>PO3<br>PO4<br>PO6 |
|----|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|-------------|---------------------------------|
|    | b) | A solid shaft of <b>10cm</b> diameter transmits <b>74kW</b> at <b>150 rev/min</b> .<br>Calculate (i) the torque on the shaft, (ii) the maximum shear stress developed, (iii) the angle of twist in length of <b>1.50m</b> and (iv) the shear stress at a radius of <b>3cm</b> . Take $C = 8MN/cm^2$                                                                                                                             | 8 Marks  | L4         | CO3         | PO1<br>PO2<br>PO3<br>PO4<br>PO6 |
|    |    | (OR)                                                                                                                                                                                                                                                                                                                                                                                                                            |          |            |             |                                 |
| 8. | a) | A short cast iron column of cross sectional area $4\text{cm}^2$ carries an axial compressive load of 250kN. For a plane inclined at $60^{\circ}$ 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<br>PO2<br>PO3<br>PO4<br>PO6 |
|    | b) | Explain in detail the method of finding principal stresses using Mohr's circle for biaxial stresses.                                                                                                                                                                                                                                                                                                                            | 4 Marks  | L3         | CO3         | PO1<br>PO2<br>PO3<br>PO4<br>PO6 |
| 0  | `` |                                                                                                                                                                                                                                                                                                                                                                                                                                 |          | <b>T</b> 0 | <b>GO</b> 4 | DOI                             |
| 9. | a) | Obtain a relation between curvature, slope and deflection of a beam.                                                                                                                                                                                                                                                                                                                                                            | 4 Marks  | L2         | CO4         | PO1<br>PO2<br>PO3<br>PO4        |
|    | b) | A simply supported beam AB of span of 5m is carrying a point<br>load of 30kN at a distance 3.75m from the left end A. Calculate<br>the slopes at A and B and deflection under the load.<br>Take $EI = 26 \times 10^{12} \text{ N-mm}^2$                                                                                                                                                                                         | 8 Marks  | L4         | CO4         | PO1<br>PO2<br>PO3<br>PO4        |
| 10 |    | (OR)                                                                                                                                                                                                                                                                                                                                                                                                                            | 1234 1   | ти         | 004         | DO 1                            |
|    |    | A horizontal steel girder having uniform cross section is 14m<br>long and is simply supported at its ends. It carries two<br>concentrated loads as shown in figure. Using Macaulay's<br>method, calculate the deflections of the beam under the loads C<br>and D. Take $E = 200$ , GPa and $I = 160 \times 10^6 \text{ mm}^4$<br>12 kN 8 kN<br>$A = \frac{12 \text{ kN}}{C} = \frac{8 \text{ kN}}{D} = \frac{4.5 \text{ m}}{B}$ | 12 Marks | L4         | 04          | PO1<br>PO2<br>PO3<br>PO4        |
|    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                 |          |            |             |                                 |
|    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                 |          |            |             |                                 |

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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<br>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<br>straight current carrying filament and also sketch the resulting<br>magnetic flux lines.                                                                    | 6 Marks            | L2             | CO1        | PO2        |  |
|               | b)       | The point charge Q = 18 nC has a velocity of 5 x 10 <sup>6</sup> m/s in the direction $0.6\hat{a}_x + 0.75\hat{a}_y + 0.3\hat{a}_z$ . Calculate the force exerted                                                          | 6 Marks            | L3             | CO1        | PO1        |  |
|               |          | on the charge by the field $B = (-3\hat{a}_x + 4\hat{a}_y + 6\hat{a}_z) mT$ .                                                                                                                                              |                    |                |            |            |  |
|               |          | UNIT-II                                                                                                                                                                                                                    |                    |                |            |            |  |
| 3.            | a)<br>b) | State and prove Maxwell's four equations for time varying fields.<br>In a medium of conduction current density given by $J = 6\cos(\omega t - 10z) a_y + \sin(\omega t - 10z) a_z mA/m^2$ , find the volume charge density | 6 Marks<br>6 Marks | L1<br>L3       | CO2<br>CO2 | PO2<br>PO1 |  |
|               |          | (OR)                                                                                                                                                                                                                       |                    |                |            |            |  |
| 4             | a)       | Determine the boundary conditions for electrostatic fields at a                                                                                                                                                            | 6 Marks            | L1             | CO2        | PO2        |  |
|               | u)       | conductor – dielectric interface.                                                                                                                                                                                          | 6 Morka            | L1             | CO2        | DO2        |  |
|               | 0)       | UNIT-III                                                                                                                                                                                                                   | 0 IVIAIKS          | LI             | 002        | PO2        |  |
| 5.            | a)       | Derive expression for resultant fields due to oblique incidence of<br>an EM wave on a perfect conductor.                                                                                                                   | 6 Marks            | L1             | CO3        | PO2        |  |
|               | b)       | If there is a magnetic field represented by                                                                                                                                                                                | 6 Marks            | L4             | CO3        | PO2        |  |
|               |          | B = $2\sin(\omega t - \beta x) \mathbf{a}_x + 2y\cos(\omega t - \beta x) \mathbf{a}_y$ in a medium where $\mathbf{p}_v = 0$ ,                                                                                              |                    |                |            |            |  |
|               |          | $\sigma=0$ , J=0, find the electric field. Assume $\varepsilon_r = 1$ and $\mu_r=1$ .<br>(OR)                                                                                                                              |                    |                |            |            |  |
| 6.            | a)       | Show that the ratio of E and H in a uniform plane wave is approximately equal to $377\Omega$ .                                                                                                                             | 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                                                                                                                                                         | 6 Marks            | L2             | CO4        | PO2        |  |
|               | )        | equation for V and I in terms of the source parameters and prove<br>that $Z_{r}^{2} = Z_{r} Z_{r}$                                                                                                                         |                    | _              | - ** •     | -          |  |
|               | b)       | Find the input impedance of a 75 $\Omega$ lossless transmission line of length 0.2 $\lambda$ , if it is terminated in a short circuit.                                                                                     | 6 Marks            | L3             | CO4        | PO2        |  |

| 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 $R = 2.5 \Omega / m$ , $L = 1.0 mH/m$ , $C = 1 pF/m$ ,<br>and $G = 0$ operates at $f = 1.5$ GHz. Find the attenuation constant<br>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                          | 6 Marks | L3 | CO4 | PO2 |
|    |    | of a line of length 50m. Characteristic impedance $z_0 = 50 \Omega$ .                                                                                                 |         |    |     |     |
|    |    | Wavelength on the line $= 0.40$ m.                                                                                                                                    |         |    |     |     |
|    |    | (OR)                                                                                                                                                                  |         |    |     |     |
| 10 | a) | Explain how single stub matching is carried out using a Smith chart.                                                                                                  | 6 Marks | L2 | CO4 | PO2 |

Find the input impedance of a  $75\Omega$  lossless transmission line of 6 Marks L4 CO4 PO3 b) length  $0.2\lambda$ . if it is terminated in an open circuit using Stub matching.

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Time: 3 hours

#### **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 ]

#### Electronics and ths

Max. Marks: 60

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

## UNIT-I

| 1. | a) | Define the time constant $\tau$ of an RC high-pass filter. What is<br>the physical significance of this parameter? When do we treat a<br>transient to have reached its steady state value?                                                             | 6 Marks            | L1 | CO1      | PO1 |
|----|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----|----------|-----|
|    | b) | Define rise time t of an RC low-pass filter and show that                                                                                                                                                                                              | 6 Marks            | L3 | CO1      | PO1 |
|    | 0) | before the triber of an RC low-pass filter and show that $t = 2.2 \text{ RC}$                                                                                                                                                                          | 0 11 1 1 1 1 1 1 1 | 20 | 001      | 101 |
|    |    | $t_r = 2.2 RC.$ (OR)                                                                                                                                                                                                                                   |                    |    |          |     |
| 2. | a) | Draw the transfer characteristics and explain the operation of a                                                                                                                                                                                       | 6 Marks            | L2 | CO1      | PO1 |
|    |    | two way clipper.                                                                                                                                                                                                                                       |                    |    |          |     |
|    | 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 |
|    |    |                                                                                                                                                                                                                                                        |                    |    |          |     |
| 3  | a) | What is biasing? Explain the need of it List out different                                                                                                                                                                                             | 6 Marks            | L2 | CO2      | PO1 |
| 5. | u) | biasing techniques.                                                                                                                                                                                                                                    | 0 IVIUINS          | 22 | 002      | 101 |
|    | b) | An n-p-n transistor with $\beta = 50$ is used in a common emitter                                                                                                                                                                                      | 6 Marks            | L3 | CO2      | PO2 |
|    |    | 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:<br>i) Ouisscent point ii) Stability factor S                                                                                                                                                                                       |                    |    |          |     |
|    |    | (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                                                                                                                                                                                         | 6 Marks            | L3 | CO3      | PO3 |
|    |    | h-parameter model and derive the equations for input                                                                                                                                                                                                   |                    |    |          |     |
|    |    | impedance, output impedance, voltage gain and current gain.                                                                                                                                                                                            |                    |    |          |     |
| 6  | a) | (UR)                                                                                                                                                                                                                                                   | 6 Marka            | 12 | $CO^{2}$ |     |
| 0. | a) | impedance and output admittance for a BIT using low                                                                                                                                                                                                    | 0 Iviai KS         | LJ | COS      | ros |
|    |    | frequency $h$ – parameter model for CE configuration.                                                                                                                                                                                                  |                    |    |          |     |
|    | b) | A CE amplifier is drawn by a voltage source of internal                                                                                                                                                                                                | 6 Marks            | L3 | CO3      | PO2 |
|    |    | 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 <sub>I</sub> , input                                                                                                                                                              |                    |    |          |     |
|    |    | resistance $R_i$ , Voltage gain $A_V$ and output resistance $R_0$ using approximate analysis                                                                                                                                                           |                    |    |          |     |
|    |    | approximate analysis.                                                                                                                                                                                                                                  |                    |    |          |     |

|    |    | (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<br>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 |

SVEC-19

### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### SIGNALS AND SYSTEMS

### [Electronics and Communication Engineering]

|    |            | [ Electronics and Communication Engineerin                                                                                                                                                                                                                                                       | <b>1</b> 5 J |      |          |     |
|----|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------|----------|-----|
| ]  | Fime: 3    | b hours                                                                                                                                                                                                                                                                                          |              | Max. | Marks: ( | 50  |
|    |            | Answer One Question from each Unit                                                                                                                                                                                                                                                               |              |      |          |     |
|    |            | All questions carry equal marks                                                                                                                                                                                                                                                                  |              |      |          |     |
|    |            |                                                                                                                                                                                                                                                                                                  |              |      |          |     |
| 1. | a)         | Illustrate the following classifications of continuous time sequences with examples.                                                                                                                                                                                                             | 6 Marks      | L1   | CO1      | PO2 |
|    | 1.)        | <ul><li>i) Static and Dynamic systems.</li><li>ii) Time variant verses and Time in-variant systems.</li></ul>                                                                                                                                                                                    |              | 1.2  | CO1      | DOO |
|    | D)         | Given a signal.                                                                                                                                                                                                                                                                                  | 6 Marks      | L2   | COI      | PO2 |
|    |            | x(t) = t + 2 $-2 < t < 2$                                                                                                                                                                                                                                                                        |              |      |          |     |
|    |            | = 0 otherwise.                                                                                                                                                                                                                                                                                   |              |      |          |     |
|    |            | Plot the following signals $x(2t)$ , $x(-t)$ , $x(t/2)$ , $2x(-2t+3)$ .                                                                                                                                                                                                                          |              |      |          |     |
|    |            | (OR)                                                                                                                                                                                                                                                                                             |              |      |          |     |
| 2. | a)         | Test whether the following signals are periodic signals or<br>aperiodic signals. In case of periodic signals, determine the<br>fundamental frequencies.                                                                                                                                          | 6 Marks      | L2   | CO1      | PO2 |
|    |            | i) $x(t) = 2\sin(2/3)t + 3\cos(2\pi/5)t.$<br>ii) $x(t) = 4\cos(3\pi t + \pi/2) + 2\sin(8\pi t + \pi/2).$                                                                                                                                                                                         |              |      |          |     |
|    | b)         | Find the energy of a rectangular pulse having unit height and unit<br>width centered at origin. Suppose now this signal is shifted right<br>side (or left side) by 1 unit. Find the new signals energy and<br>power. Is there any change in the value of energy calculated?<br>Give the reasons. | 6 Marks      | L3   | CO1      | PO2 |
|    |            |                                                                                                                                                                                                                                                                                                  |              |      |          |     |
| 3. | a)         | i) State and prove the Time Reversal property of Fourier<br>Transform                                                                                                                                                                                                                            | 6 Marks      | L1   | CO2      | PO1 |
|    |            | ii) Using that property find $x(t) = u(t) + u(-t)$                                                                                                                                                                                                                                               |              |      |          |     |
|    | <b>b</b> ) | Find the Fourier Transform of $x(t) = e^{-at}u(t)$ .                                                                                                                                                                                                                                             | 6 Marks      | L2   | CO2      | PO1 |
|    | 0)         |                                                                                                                                                                                                                                                                                                  |              |      |          |     |
| 4  |            |                                                                                                                                                                                                                                                                                                  | 10.14        | 1.0  | 000      | DOO |
| 4. |            | State and prove convolution property in Fourier Transform.                                                                                                                                                                                                                                       | 12 Marks     | L2   | 002      | 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                                                                                                                                                                                                                                 | 6 Marks      | L1   | CO3      | PO1 |
|    |            | $H(w) = \frac{1}{1 + jw}$ and find the ESD of the output.                                                                                                                                                                                                                                        |              |      |          |     |
|    |            | (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 6 Marks L1 CO3 PO5 pulse.

|    |          | y(t) 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |            |      |              |
|----|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------|------|--------------|
|    |          | x(t) $1$ $t$ $-1$ $0$ $1$ $t$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                    |            |      |              |
|    |          | UNIT-IV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                    |            |      |              |
| 7. | a)       | The step response of an LTI system is found to be $2e^{-3t}u(t)$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 6 Marks            | L3         | CO4  | PO2          |
|    |          | i) Find the impulse response h(t) of the system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                    |            |      |              |
|    |          | is $e^{-t}u(t)$ .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    |            |      |              |
|    |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |            |      |              |
|    | b)       | Find the Laplace Transform of the signal $(1) = \frac{1}{2} \frac{1}{$ | 6 Marks            | L2         | CO4  | PO2          |
|    |          | $x(t) = e^{-t}u(-t) + e^{-t}u(-t)$ and also find its ROC.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |            |      |              |
| 8. | a)       | Using properties of Laplace Transform find:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 6 Marks            | L2         | CO4  | PO2          |
|    |          | i) $x(t) = te^{-t}u(t)$ .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |            |      |              |
|    |          | ii) $x(t) = e^{-2t} \cos(2\pi 100t) u(t)$ .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    |            |      |              |
|    | b)       | Find the inverse Laplace Transform of the following :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 6 Marks            | L1         | CO4  | PO1          |
|    | -)       | $X(S) = \frac{S+1}{S}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |            |      |              |
|    |          | (S+1)(S+1) + 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                    |            |      |              |
| 0  | `        | UNIT-V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    | т 1        | 005  | DO 1         |
| 9. | a)<br>b) | State and prove Sampling theorem.<br>An amplifier with Gain = $30$ dB and Bandwidth = $25$ KHZ is                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 6 Marks<br>6 Marks |            | CO5  | PO1<br>PO4   |
|    | 0)       | found to have $T = 120$ K. Noise figure = 2. Find output noise.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0 Marks            | ĽJ         | 005  | 104          |
| 10 | ,        | (OR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                    | <b>T A</b> | 00 F | <b>D O A</b> |
| 10 | a)       | Explain the reconstruction of a signal from its samples using interpolation technique                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 6 Marks            | L2         | 005  | PO2          |
| •  | b)       | List out different types of Noises.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 6 Marks            | L3         | CO5  | PO4          |
|    |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |            |      |              |

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**CODE No.: 19BT30404** 

#### 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   | b hours                                                                                                                                                                                                                          |                    | Max.     | Marks: (   | 60         |
|----|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------|------------|------------|
|    |           | Answer One Question from each Unit<br>All questions carry equal marks                                                                                                                                                            |                    |          |            |            |
|    |           |                                                                                                                                                                                                                                  |                    |          |            |            |
| 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                                                                                                                                                                 | 6 Marks            | L3       | CO1        | PO3        |
|    | ,         | represent the last two digits. Convert the number $(456)_{12}$ to base 8                                                                                                                                                         |                    |          |            |            |
|    |           | (OR)                                                                                                                                                                                                                             |                    |          |            |            |
| 2. | a)<br>b)  | Generate even parity hamming code for the data word 10011010.<br>i) Simplify the given Boolean expression<br>$f = ABC + \overline{A} \ \overline{B} \ C + A\overline{B} + AB\overline{C} + \overline{A}\overline{B}\overline{C}$ | 4 Marks<br>8 Marks | L4<br>L2 | CO1<br>CO1 | PO4<br>PO2 |
|    |           | ii) Perform the subtraction using 10 <sup>th</sup> complements.                                                                                                                                                                  |                    |          |            |            |
|    |           | i) $(1000)_{10}$ - $(756)_{10}$<br>ii) $(10)_{10}$ - $(100)_{10}$ .<br><b>UNIT-II</b>                                                                                                                                            |                    |          |            |            |
| 3. | a)        | Implement the following function in multi-level NAND<br>F = ABC + ABC + ABD + ABD.                                                                                                                                               | 6 Marks            | L3       | CO1        | PO2        |
|    | b)        | Obtain the simplified expression in POS, implement with NOR                                                                                                                                                                      | 6 Marks            | L4       | CO1        | PO4        |
|    |           | gates $F(w,x,y,z) = \sum_{m} (1, 2, 4, 11, 12, 13) + \sum_{d} (0, 3, 6, 10).$<br>(OR)                                                                                                                                            |                    |          |            |            |
| 4. | a)        | Determine essential prime implicates given Boolean expression<br>using tabulation method $F = ACD + BCD + BCD + ACD$ .                                                                                                           | 6 Marks            | L3       | CO1        | PO2        |
|    | b)        | Simplify the expression in SOP                                                                                                                                                                                                   | 6 Marks            | L4       | CO1        | PO4        |
|    |           | $F(w,x,y,z) = \sum_{m} (0, 3, 4, 5, 7) + \sum_{d} (8, 9, 10, 11, 12, 13, 14, 15).$                                                                                                                                               |                    |          |            |            |
| 5. | a)        | Implementing the logic function using a multiplexer $2^{N-1}$ input line, where N is the number of variables in the function                                                                                                     | 6 Marks            | L3       | CO1        | PO4        |
|    |           | $F(A, B, C, D) = \sum_{m} (4, 5, 6, 7, 8, 13, 14, 15).$                                                                                                                                                                          |                    |          |            |            |
|    | b)        | Define encoder. Design Octal to Binary encoder.<br>(OR)                                                                                                                                                                          | 6 Marks            | L4       | CO2        | PO2        |
| 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        |
| -  | `         |                                                                                                                                                                                                                                  |                    | т. о     | <b>GO2</b> | DOA        |
| 1. | a)<br>b)  | Convert JK Flip Flop to 1 Flip Flop.                                                                                                                                                                                             | 6 Marks            | L3       | $CO_2$     | PO3        |
|    | 0)        | neat diagram.                                                                                                                                                                                                                    | 0 IVIAIKS          | LS       | COI        | rOo        |
| 8  | <i>a)</i> | (UK)<br>Design 3 Bit LIP/Down Synchronous counter using T Flin Flon                                                                                                                                                              | 6 Marko            | 13       | $CO^{2}$   | POA        |
| 0. | b)        | Design a 5 Bit Ring counter and explain the operation.                                                                                                                                                                           | 6 Marks            | L3       | CO2        | PO6        |

SVEC-19

## UNIT-V

| 9. | a) | A combinational circuit is defined by the function                               | 6 Marks | L3 | CO3 | PO2 |
|----|----|----------------------------------------------------------------------------------|---------|----|-----|-----|
|    |    | $F_1(A, B, C) = \sum_m (3, 5, 6, 7)$ $F_2 = \sum_m (0, 2, 4, 7)$ . Implement the |         |    |     |     |
|    |    | circuit with PLA having 3 inputs, 4 product terms and two                        |         |    |     |     |
|    |    | outputs.                                                                         |         |    |     |     |
|    | b) | Realize a Logic function using F (A, B, C) = $\Sigma_m$ (2, 4, 5, 6) using       | 6 Marks | L2 | CO3 | PO7 |
|    |    | Hazard Free logic gate network.                                                  |         |    |     |     |
|    |    | (OR)                                                                             |         |    |     |     |
| 10 | a) | Distinguish the following.                                                       | 6 Marks | L1 | CO4 | PO2 |
|    |    | i) PROM. ii) PAL. iii) PLA.                                                      |         |    |     |     |
|    | b) | Implement the following function using PROM                                      | 6 Marks | L3 | CO3 | PO2 |
|    |    | $F_1(A, B, C) = \sum_m (0, 1, 2)  F_2 = \sum_m (4, 5, 6, 7).$                    |         |    |     |     |

**CODE No.: 19BT30501** 

### 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 **Answer One Ouestion from each Unit** All questions carry equal marks UNIT-I Compare and contrast raster scan systems and random scan 1. 6 Marks  $\mathbf{I4}$ CO1 PO1 a) systems. b) Write an algorithm to draw a line using Bresenhams approach. 6 Marks L1 CO2 PO2 (**OR**) 2. Illustrate the working of a CRT with neat sketch. 6 Marks L2 CO1 PO1 a) Discuss in detail input devices. b) 6 Marks L1 CO1 PO1 UNIT-II Differentiate boundary fill algorithm and flood fill algorithm. 3. L4 PO2 a) 6 Marks CO2 What is the use of homogeneous coordinates in transformations? 6 Marks L2 CO3 PO2 b) Explain in detail. (**OR**) 4. Derive a transformation matrix to rotate an object with respect to 6 Marks L3 CO3 PO3 a) a given point. Explain in detail composite transformations. 6 Marks PO1 b) L2 CO3 (UNIT-III) Discuss in detail window-to-viewport coordinate transformation. 5. a) 6 Marks L2 CO3 PO1 Apply Cohen-Sutherland line clipping algorithm for the line b) 6 Marks L3 CO3 PO3 having end points A(-1, 5) and B(3, 8) against window coordinates (-3, 1) and (2, 6). (**OR**) What is a polygon surfaces? Explain in detail. 6. 6 Marks L1 CO3 PO1 a) Explain the properties of Bezier curves. b) 6 Marks L2 CO3 PO2 UNIT-IV Discuss in detail basic 3D transformations. PO1 7. 6 Marks L1 CO3 a) Illustrate 3D viewing pipeline. 6 Marks L1 CO3 PO1 b) (**OR**) 8. a) Differentiate parallel projection and perspective projection. 6 Marks  $\mathbf{I4}$ CO3 PO<sub>2</sub> Write a short note on clipping in 3D. 6 Marks b) L2 CO3 PO1 UNIT-V 9. What is an illumination model? Discuss in detail. 6 Marks L2 CO4 PO<sub>2</sub> a) Explain Back-face detection with an example. 6 Marks L2 CO4 PO2 b) (**OR**) Discuss in detail Scan-line method. L2 **PO2** 10 a) 6 Marks CO4 What is surface rendering? Explain Gouraud shading method. 6 Marks L2 CO4 PO2 b)

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**SVEC-19** 

Max. Marks: 60

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                                                                                                                                                                                                                                                                                      | 6 Marks  | L1 | CO1 | PO2 |
|----|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----|-----|-----|
|    |    | <ul> <li>equal to 54<sub>y</sub> (in base y number system).</li> <li>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.</li> </ul>                                                            |          |    |     |     |
|    | b) | Provide significance of distinct number systems. Identify why<br>binary number system is more suitable for digital computers with<br>respective to other number systems. And convert (4675) <sub>16</sub> ,<br>(A467B89) <sub>16</sub> , (5371) <sub>8</sub> and (7856) <sub>10</sub> to binary numbers.<br>(OR)                                             | 6 Marks  | L2 | CO1 | PO2 |
| 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 |
| 3. | a) | <ul> <li>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? <ol> <li>Carry.</li> <li>Carry.</li> <li>Zero.</li> <li>Overflow.</li> <li>Sign.</li> <li>Even Parity.</li> </ol> </li> </ul> | 5 Marks  | L2 | CO3 | PO1 |
|    | b) | Briefly discuss the basic instruction cycle of processor.                                                                                                                                                                                                                                                                                                    | 7 Marks  | L2 | CO2 | PO1 |
| 4. | a) | The following transfer statements specify a memory. Explain the memory operation in each case.<br>i) R1←M[AR]<br>ii) M[AR]←R4<br>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               | 6 Marks    | L2         | CO2        | PO1                 |
|    | <b>b</b> ) | chart of the I/O subsystem that is driven by interrupts.                      | 6 Marka    | 12         | CO4        |                     |
|    | 0)         | Micro Instruction has three fields. The Micro operation field has             | U IVIAIKS  | LJ         | 04         | 105                 |
|    |            | 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?                         |            |            |            |                     |
|    |            | 111) How many bits are left to select an input for the multiplexers?          |            |            |            |                     |
|    |            | (OR)                                                                          |            |            |            |                     |
| 6. | a)         | What happens in the daisy-chain priority interrupt when device 1              | 6 Marks    | L2         | CO3        | PO2                 |
|    |            | requests an interrupt after device 2 has sent an interrupt request            |            |            |            |                     |
|    |            | to the CPU but before the CPU responds with the interrupt                     |            |            |            |                     |
|    | <b>b</b> ) | Explain how communication between CPU and IOP takes place                     | 6 Marks    | 12         | $CO^{2}$   |                     |
|    | 0)         | with flowchart.                                                               | 0 Iviaiks  | L          | 002        | 101                 |
|    |            | UNIT-IV                                                                       |            |            |            |                     |
| 7. | a)         | What is Hit ratio in cache memory and explain about Direct                    | 6 Marks    | L2         | CO3        | PO1                 |
|    |            | mapping in cache?                                                             |            |            | <b>a a</b> | DOI                 |
|    | b)         | How many bits will be for tag, index, block and word field of address format? | 6 Marks    | L3         | CO2        | POI                 |
| 0  |            | (OR)                                                                          | 10.16.1    | <b>T A</b> | <b>a a</b> | <b>D</b> O <b>0</b> |
| 8. |            | Discuss the strobe control method for Asynchronous data transfer              | 12 Marks   | L2         | CO3        | PO2                 |
|    |            |                                                                               |            |            |            |                     |
| 9  | a)         | Illustrate the terms arithmetic pipeline and instruction pipeline             | 6 Marks    | L2         | CO3        | PO1                 |
|    | u)         | and write short notes on them.                                                | 0 Infunito |            | 005        | 101                 |
|    | b)         | Explain about Hardware Performance issues.                                    | 6 Marks    | L2         | CO3        | PO1                 |
|    |            | (OR)                                                                          |            |            |            |                     |
| 10 | a)         | Discuss about Inter-processor arbitration.                                    | 6 Marks    | L2         | CO2        | PO2                 |
| •  | 0)         | Explain design issues of instruction pipeline.                                | o iviarks  | L2         | 002        | PUI                 |

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(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<br>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.<br>Explain how the insertion and deletion operations are performed<br>at the specified position of the circular linked list. | 8 Marks | L1             | CO1 | PO2 |
| 2  | ``            |                                                                                                                                                                                                     | O. M. 1 | т 2            | 001 | DOJ |
| 3. | a)            | Define a stack. Explain the implementation of the stack using linked lists.                                                                                                                         | 8 Marks | L3             | COI | PO3 |
|    | b)            | Convert the given infix expression to postfix ((A+B)*C) / D-E*F+G.                                                                                                                                  | 4 Marks | L4             | CO4 | PO2 |
| 1  | a)            | (UK)<br>How circular queue is advantageous over linear queue? Write its                                                                                                                             | 6 Marks | 13             | CO1 | PO3 |
| 4. | a)            | implementation.                                                                                                                                                                                     |         | LJ             |     | 103 |
|    | b)            | Discuss the priority queues in detail with an example.                                                                                                                                              | 6 Marks | L2             | COI | PO2 |
| 5. | a)            | A binary tree has seven nodes. The Preorder and Postorder<br>traversals of the tree are given below. Can you draw the tree?<br>Justify.<br>Preorder: GFDABEC.                                       | 6 Marks | L2             | CO2 | PO1 |
|    | b)            | Define the red-black tree. Write about how we implement red-<br>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 |
| 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                                        | 6 Marks | L2         | CO4         | PO1 |
|    | 1 \ | suitable example.                                                                                         |         | <b>T</b> 0 | <b>GO 1</b> | DOA |
|    | 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                                        | 6 Marks | L2         | CO2         | PO1 |
| •  |     | spanning tree for the given graph with an example.                                                        |         |            |             |     |
|    | b)  | Solve: Given the input (322, 134, 141, 969, 1979, 611, 6172,                                              | 6 Marks | L4         | CO2         | PO3 |
|    |     | 4199) and hash function $h(x) = x \mod 10$ , show the resulting.                                          |         |            |             |     |
|    |     | i) Separate Chaining, ii) Closed hashing using linear probing and                                         |         |            |             |     |
|    |     | double hashing $h2(x) = 8-(x \mod 8)$ .                                                                   |         |            |             |     |
|    |     | 1) Separate Chaining, 11) Closed hashing using linear probing and double hashing $h2(x) = 8-(x \mod 8)$ . |         |            |             |     |

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

### ELECTRICAL AND ELECTRONICS MEASUREMENTS

### [ Electronics and Instrumentation Engineering ]

| Т  | Time: 3 hours |                                                                                                                                                                                                                                                                                                                                                                                                                                           |          | Max. Marks: 60 |     |     |  |  |  |  |
|----|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------------|-----|-----|--|--|--|--|
|    |               | Answer One Question from each Unit<br>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 $50\Omega$ 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<br>movement with 10 mA and internal resistance of 5 $\Omega$ . The battery<br><b>emf</b> is 3V. It is desires to modify the circuit by adding<br>appropriate shunt resistances across the movement, so that<br>instrument indicates 0.5 $\Omega$ at the midpoint on its scale. Calculate<br>value of shunt resistance and value of limiting resistor R <sub>L</sub> .<br>(OR) | 6 Marks  | L3             | CO1 | PO2 |  |  |  |  |
| 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 |  |  |  |  |
| 5. | a)            | Explain the construction and working principle of Electrodynamometer wattmeter.                                                                                                                                                                                                                                                                                                                                                           | 6 Marks  | L1             | CO1 | PO1 |  |  |  |  |
|    | b)            | Discuss in detail about Polyphase energy meter.<br>(OR)                                                                                                                                                                                                                                                                                                                                                                                   | 6 Marks  | L2             | CO2 | PO5 |  |  |  |  |
| 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 $60^{\circ}$ and $90^{\circ}$ when the density in the field coils is $15 \times 10^{-3}$ Wb/m <sup>2</sup> , 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<br>Bridge and derive the expression.                                                                                                                                                                                                                                                                                                                                      | 6 Marks  | L2             | CO3 | PO2 |  |  |  |  |
|    | b)            | Discuss in detail about the operation of Q-meter.<br>(OR)                                                                                                                                                                                                                                                                                                                                                                                 | 6 Marks  | L2             | CO3 | PO2 |  |  |  |  |
| 8. | a)            | Design a bridge used for measurement of low value inductance<br>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  | 6 Marks | L2 | CO4 | PO1 |
|    |    | meter.                                                          |         |    |     |     |
|    |    | (OR)                                                            |         |    |     |     |
| 10 | a) | With a neat sketch, explain the block diagram of Universal Time | 6 Marks | L2 | CO4 | PO1 |
|    |    | Counter.                                                        |         |    |     |     |
|    | b) | Analyze how universal counter can be used to measure time and   | 6 Marks | L4 | CO4 | PO1 |
|    |    | ratio.                                                          |         |    |     |     |
|    |    |                                                                 |         |    |     |     |

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

### TRANSDUCERS IN INSTRUMENTATION

[Electronics and Instrumentation Engineering]

| Т  | Time: 3 hours |                                                                                                                                                                                                                                                                                                 | Max. Marks: 60     |          |            |            |
|----|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------|------------|------------|
|    |               | Answer One Question from each Unit<br>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 100.4 $\Omega$ , 99.2 $\Omega$ , 101.1 $\Omega$ , 100.5 $\Omega$ , 99.8 $\Omega$ , 102.0 $\Omega$ , 99.9 $\Omega$ , 101.7 $\Omega$ , 100.8 $\Omega$ , 101.2 $\Omega$ . Calculate the arithmetic mean, standard deviation and variance. | 6 Marks            | L2       | CO1        | PO2        |
|    |               |                                                                                                                                                                                                                                                                                                 |                    |          |            |            |
| 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.<br>(OR)                                                                                                                                                                                                                             | 6 Marks            | L2       | CO2        | PO6        |
| 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        |
| 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 <sup>o</sup> C is 4000K.<br>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.<br>(OR)                                                                                                                                                                                                                                  | 6 Marks            | L2       | CO4        | PO2        |
| 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        |
| 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        |
| 10 | `             | (OR)                                                                                                                                                                                                                                                                                            |                    | т А      | 000        | DO 1       |
| 10 | a)<br>b)      | Compare incremental and absolute encoders.                                                                                                                                                                                                                                                      | 6 Marks<br>6 Marks | L2<br>L2 | CO2<br>CO2 | PO1<br>PO2 |

Time: 3 hours

### SREE VIDYANIKETHAN ENGINEERING COLLEGE

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### 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]

Max. Marks: 60

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

|    |    | UNIT-I                                                                                                                                                                                                                       |         |      |     |                     |
|----|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------|-----|---------------------|
| 1. | a) | What is a tautology? Prove $[(p \land \neg q) \rightarrow r] \rightarrow [p \rightarrow (q \lor r)]$ 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 $: \mathbf{P} \rightarrow ((\mathbf{P} \rightarrow \mathbf{Q}) \land \sim (\sim \mathbf{Q} \lor \mathbf{P}))$                                                                                             | 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                 |
| 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:<br>i) $R = \{(j, k)   j \text{ is a multiple of } k\}$ .<br>ii) $R = \{(j, k)   j / k \text{ is a prime } \}$ . | 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.<br>(OR)                                                                                                                                                                     | 6 Marks | L2   | CO3 | PO4                 |
| 6. | a) | Examine whether given set $P=\{0,1,2,3,4,5,6,8\}$ can be semi                                                                                                                                                                | 6 Marks | L3   | CO3 | PO4                 |
|    | b) | group under binary operation $\theta_6$ or not.<br>Discuss in detail Isomorphism with suitable examples.                                                                                                                     | 6 Marks | L2   | CO3 | PO4                 |
|    | -) |                                                                                                                                                                                                                              | •       |      |     |                     |
| 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                 |
| 0  | `` | (OR)                                                                                                                                                                                                                         |         | т. 4 | 004 | <b>D</b> O <b>2</b> |
| 8. | a) | In how many ways can the committee of 5 teachers and<br>4 students be chosen from 9 teachers and 15 students be formed<br>if teacher A refuses to serve if student B is on the committee?                                    | 6 Marks | L4   | CO4 | PO2                 |
|    | b) | Solve the recurrence relation:<br>$a_n + a_{n-1} - 6a_{n-2} = 0$ where $a_0 = -1$ , $a_1 = 8$ .                                                                                                                              | 6 Marks | L3   | CO4 | PO2                 |

SVEC-19

### UNIT-V

- 9. a) Show that a complete graph  $K_n$  is planar iff  $n \leq 4.$  (Using 6 Marks L4 CO5 PO2 Euler's)
  - b) Define the Euler Path and determine whether the graph  $(G_1)$  is 6 Marks L3 CO5 PO2 Euler circuit or not?



10 a) Discuss Prim's spanning tree algorithm with suitable example. 6 Marks

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b) Discuss the difference between DFS and BFS with suitable 6 Marks L2 CO5 PO2 examples.

L2

CO5

PO2

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### 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.<br>Where is the spiral model beneficial? Justify your answer.<br>(OR)                       | 6 Marks  | L3             | CO1      | PO1        |
| 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        |
|               |          |                                                                                                                                                                |          |                |          |            |
| 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        |
|               |          |                                                                                                                                                                |          |                |          |            |
| 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:<br>i) Modularity. ii) Reusability. iii) Data dictionary.                                                                                 | 6 Marks  | L2             | CO3      | PO1        |
|               |          |                                                                                                                                                                |          |                |          |            |
| 7.            | a)       | What are the various testing strategies for software testing?<br>Describe them briefly.                                                                        | 6 Marks  | L1             | CO4      | PO2        |
|               | b)       | <ul> <li>Write short notes on the following with suitable examples.</li> <li>i) Graph-Based testing methods.</li> <li>ii) Equivalence Partitioning.</li> </ul> | 6 Marks  | L1             | CO4      | PO3        |
| 0             |          | (OR)                                                                                                                                                           | 6 Martin | т э            | $CO^{2}$ | DOD        |
| 0.            | a)<br>b) | What is cyclomatic complexity? Explain how to construct a flow<br>graph for a program (Fibonacci series) and compute cyclomatic<br>complexity with an example. | 6 Marks  | L2<br>L3       | CO3      | PO2<br>PO3 |
# UNIT-V

| 9. | a) | List the major risks in a software project. What are the methods                                                                | 6 Marks | L3 | CO5 | PO2 |
|----|----|---------------------------------------------------------------------------------------------------------------------------------|---------|----|-----|-----|
|    | h) | to reduce the risk of cost and schedule overruns? Give reasons.<br>Discuss the role of RMMM in the software development process | 6 Marks | L1 | CO5 | PO1 |
|    | 0) | (OR)                                                                                                                            | 0 Marks | LI | 005 | 101 |
| 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 |
|    |    |                                                                                                                                 |         |    |     |     |

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### SREE VIDYANIKETHAN ENGINEERING COLLEGE

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

#### DATA STRUCTURES AND ALGORITHMS

[ Computer Science and Systems Engineering ]

| ,  | Time: 3 | hours Answer One Ouestion from each Unit                                                                       |         | Max. Marks: 60 |            |             |  |
|----|---------|----------------------------------------------------------------------------------------------------------------|---------|----------------|------------|-------------|--|
|    |         | All questions carry equal marks                                                                                |         |                |            |             |  |
|    |         |                                                                                                                |         |                |            |             |  |
| 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.                                        | 6 Marks | L2             | CO1        | PO2         |  |
|    |         | i) Space Complexity.<br>(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         |  |
| _  |         |                                                                                                                |         |                | ~ ~ •      |             |  |
| 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)                                                                                                           |         | <b>T</b> (     | <b>a a</b> | <b>D</b> 00 |  |
| 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<br>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<br>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     | 6 Marks | L3 | CO5 | PO5 |
|----|----|------------------------------------------------------------------|---------|----|-----|-----|
|    |    | operation in B+tree in detail.                                   |         |    |     |     |
|    | 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    | 6 Marks | L2 | CO5 | PO2 |
|    |    | its complexity analysis.                                         |         |    |     |     |
|    | b) | Mention the Hash Table Structure and its applications in detail. | 6 Marks | L3 | CO5 | PO5 |
|    |    |                                                                  |         |    |     |     |

# 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]

| ]  | Гime: 3  | hours                                                                                                                                                                                                                                                        |                    | Max. Marks: 60 |            |            |  |  |  |  |  |  |  |  |
|----|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------|------------|------------|--|--|--|--|--|--|--|--|
|    |          | Answer One Question from each Unit<br>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        |  |  |  |  |  |  |  |  |
| 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        |  |  |  |  |  |  |  |  |
| 4. | a)       | Explain the Resource-Allocation-Graph algorithm for deadlock                                                                                                                                                                                                 | 6 Marks            | L4             | CO2        | PO2        |  |  |  |  |  |  |  |  |
|    | b)       | Define Monitor. Give the schematic view of the basic monitor.                                                                                                                                                                                                | 6 Marks            | L1             | CO2        | PO2        |  |  |  |  |  |  |  |  |
| 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:<br>1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6. How many<br>page faults would occur for the optimal page replacement<br>algorithm, assuming three frames and all frames are initially<br>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)<br>b) | Explain various file access methods with suitable examples.<br>List out various algorithms in directory implementation.                                                                                                                                      | 6 Marks<br>6 Marks | L4<br>L1       | CO4<br>CO4 | PO2<br>PO2 |  |  |  |  |  |  |  |  |
| 8. | a)       | Explain the three allocation methods in file system                                                                                                                                                                                                          | 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 |
|    |    |                                                               |         |    |     |     |

# 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 ]

| Т  | ime: 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 |
| 3. | a)            | Write the snippet for opens the file for writing in append mode,                                                                 | 6 Marks        | L2    | CO2      | PO1 |
|    | ,             | writes the given string to the associated stream, and then closes the stream.                                                    |                |       |          |     |
|    | b)            | Write a sample program using buffered I/O to define the structure and writes the content of the structure to standard            | 6 Marks        | L2    | CO2      | PO1 |
|    |               | output.                                                                                                                          |                |       |          |     |
| Δ  | a)            | ( <b>UN</b> )<br>Explain ftrylockfile() flockfile() functions with syntax                                                        | 6 Marks        | 13    | $CO^{2}$ | PO2 |
| ч. | $\frac{a}{b}$ | Standard I/O implements three types of user buffering and                                                                        | 6 Marks        | $L_2$ | CO2      | PO1 |
|    | 0)            | provides developers with an interface for controlling the type and size of the buffer. Explain these three buffering techniques. | 0 IVIUIRS      | 1.2   | 002      | 101 |
|    |               | 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. (OR)                                                                         | 6 Marks        | L2    | CO4      | PO2 |
| 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 |

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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

#### NUMERICAL METHODS, PROBABILITY AND STATISTICS

[Civil Engineering, Mechanical Engineering, Computer Science and Engineering,

Information Technology, Computer Science and Systems Engineering]

Time: 3 hours

Answer One Question from each Unit

All questions carry equal marks

# UNIT-I

- 1. a) Using method of false position, estimate an approximate root 6 Marks L3 CO1 PO2 correct to three decimal places for the equation  $\mathbf{x}^3 \mathbf{x} \mathbf{4} = \mathbf{0}$ .
  - b) Derive a recurrence formula for evaluating  $\sqrt{N}$  by Newton-Raphson method and hence estimate  $\sqrt{10}$  correct to three 6 Marks L3 CO1 PO1 decimal places.

(OR)

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

| x | 0 | 1 | 2  | 3  | 4  |
|---|---|---|----|----|----|
| У | 3 | 6 | 11 | 18 | 27 |

b) Estimate the value of y(10) from the following data using 6 Marks L5 CO1 PO1 Lagrange's interpolation formula.

| <i></i> | 12 | 15 |    |    | TI |
|---------|----|----|----|----|----|
| v       | 12 | 13 | 1/ | 16 |    |
| x       | 5  | 6  | 9  | 11 |    |

3.

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

| ÷ |   |        |        |        |        |        |        |        |
|---|---|--------|--------|--------|--------|--------|--------|--------|
|   | 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  $\int_{0}^{\frac{1}{2}} \frac{1}{\sqrt{1-x^{2}}} dx \quad for \ n=6.$ 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 6 Marks L3 CO1 PO1 y(0.2), given  $y' = x y y^2$ , y(0) = 1.

#### UNIT-III)

- 5. a) If X and Y are discrete random variables and K is a constant, 6 Marks L1 CO2 PO1 show that:
  - i) E(X+K) = E(X)+K
  - ii) E(X+Y) = E(X) + E(Y).

Max. Marks: 60

A continuous variable X has the distribution function  $[0, if x \le 1]$ 6 Marks CO2 PO1 b) L3  $F(x) = \begin{cases} K(x-1)^4, & \text{if } 1 < x \le 3\\ 1, & \text{if } x > 3 \end{cases}$ if x > 3Determine : i) the probability density functions of Xii) K. (**OR**) 6. A player tosses 3 fair coins. He wins Rs. 500 if 3 heads appear, 6 Marks L5 CO<sub>2</sub> PO<sub>2</sub> a) 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. Show that variance of a random variable X is given by 6 Marks L1 CO<sub>2</sub> PO1 b)  $\sigma^2 = E(X^2) - [E(X)]^2$ . UNIT-IV) 7. Average number of accidents on any day on a national highway L3 CO<sub>2</sub> **PO2** 6 Marks a) is 1.8. Determine the probability that the numbers of accidents is: i) at least one ii) at most one. b) In a sample of 1000 cases, the mean of a certain test is 14 and 6 Marks L1 CO<sub>2</sub> PO1 standard deviation is 2.5. Assuming the distribution to be normal, i) how many students score between 12 and 15. find ii) how many score above 18. iii) how many score below 18. (**OR**) 8. a) Construct a binomial distribution to the following data and find 6 Marks L3 CO2 PO1 the expected frequencies. 2 3 4 5 0 1 6 х 16 4 13 25 52 58 32 f(x)L5 b) The marks obtained in statistics in a certain examination found to 6 Marks CO<sub>2</sub> PO2 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. UNIT-V 9. Explain about : i) Null hypothesis ii) Type-I and type-II errors. a) 6 Marks L2 CO<sub>2</sub> PO1 A random sample of size 16 values from a normal population 6 Marks L4 CO2 PO4 b) 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. (**OR**) 10 a) In a big city 325 men out of 600 men were found to be smokers. 6 Marks L4 CO<sub>2</sub> PO4 Does this information support the conclusion that the majority of the men in this city are smokers? Analyze the given information and conclude. b) Four methods are under development for making discs of a super 6 Marks L4 CO<sub>2</sub> PO4 conducting material. Fifty discs are made by each method and they are checked for super conductivity when cooled with liquid. 1<sup>st</sup> 2<sup>nd</sup> 3<sup>rd</sup> 4<sup>th</sup> Method Method Method Method Super conductors 31 42 22 25 19 8 28 25 Failures

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

| •  | CODE      | No.: 19BT3BS02                                                                                     | · · · · · ·         |         | SVE      | <u>C-19</u>         |
|----|-----------|----------------------------------------------------------------------------------------------------|---------------------|---------|----------|---------------------|
|    |           | Roll No.                                                                                           |                     |         |          |                     |
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|    |           | II B.Tech I Semester (SVEC-19) Supplementary Examinat                                              | tions Aug           | ust – 2 | 021      |                     |
|    |           | SPECIAL FUNCTIONS AND COMPLEX ANA                                                                  | LYSIS               |         |          |                     |
|    |           | [Electrical and Electronics Engineering, Electronics and Commu                                     | inication l         | Enginee | ring,    |                     |
| ,  | Г: 1      | Electronics and Instrumentation Engineering                                                        | gl                  | Ман     | Maalaa   | <b>C</b> 0          |
|    | Time: 5   | Answer One Question from each Unit                                                                 |                     | Max.    | Marks: 0 | 50                  |
|    |           | All questions carry equal marks                                                                    |                     |         |          |                     |
|    |           |                                                                                                    |                     |         |          |                     |
| 1. | a)        | Establish the recurrence relation of Gamma function and hence                                      | 6 Marks             | L1      | CO1      | PO1                 |
|    | b)        | show that $\Gamma(n+1) = n!$ , where <i>n</i> is a positive integer.                               | 6 Marks             | 12      | CO1      | PO1                 |
|    | 0)        | Define Beta function and show that $\beta(m,n) = \int \frac{x^{m+n}}{(1+m)^{m+n}} dx$ .            | 0 WIAIKS            |         | COI      | 101                 |
|    |           | $\int_{0}^{0} (1 + x)$                                                                             |                     |         |          |                     |
| 2. | a)        | $[1]^{n-1}$                                                                                        | 6 Marks             | L1      | CO1      | PO1                 |
|    |           | Show that $\Gamma(n) = \int_{\Omega} \left  \log \frac{1}{x} \right  dx$ .                         |                     |         |          |                     |
|    | b)        | From the definition of Beta function, establish the relation                                       | 6 Marks             | L2      | CO1      | PO2                 |
|    |           | $\beta(m,n) = \beta(m+1, n) + \beta(m, n+1).$                                                      |                     |         |          |                     |
| •  | 、<br>、    | (UNIT-II)                                                                                          |                     |         | 0.01     | <b>D</b> O <b>A</b> |
| 3. | a)        | Express $J_4(x)$ in terms of $J_0(x)$ and $J_1(x)$ .                                               | 6 Marks             | L2      | COI      | PO2                 |
|    | b)        | Show that $5x^3 = 2P_3(x) + 3P_1(x)$ .                                                             | 6 Marks             | L2      | COI      | PO2                 |
| Λ  | a)        | (OR)                                                                                               | 6 Marks             | T 1     | CO1      | PO1                 |
| 4. | <i>a)</i> | Prove that $\frac{d}{dx}[xJ_1(x)] = xJ_0(x)$ .                                                     | 0 Warks             | LI      | COI      | 101                 |
|    | b)        | Establish the relation $J_0^2(x) + 2[J_1^2(x) + J_2^2(x) + J_3^2(x) +] = 1$                        | 6 Mortra            | T 1     | CO1      |                     |
|    |           | where $J_n(x)$ denotes the Bessel function of order <i>n</i> .                                     | 0 Marks             | LI      | COI      | PUI                 |
| _  |           | (UNIT-III)                                                                                         |                     |         |          |                     |
| 5. | a)        | By Milne-Thomson method, construct an analytic function                                            | 6 Marks             | L3      | CO2      | PO2                 |
|    |           | $f(z) = u + iv$ where $v = \frac{2 \sin x \sin y}{\cos 2x + \cosh 2y}$ .                           |                     |         |          |                     |
|    | b)        | Find the image of the ring shaped region $1 <  z  < 2$ under the                                   |                     |         |          |                     |
|    |           | transformation $w = 2iz + 1$ .                                                                     | 6 Marks             | L2      | CO2      | PO1                 |
|    |           | (OR)                                                                                               |                     |         |          |                     |
| 6. | a)        | Write the necessary and sufficient conditions for analyticity and                                  | 6 Marks             | L2      | CO2      | PO1                 |
|    |           | show that the function $f(z) = \sqrt{ xy }$ is not analytic at the origin                          |                     |         |          |                     |
|    |           | although Cauchy- Riemann equations are satisfied at the origin.                                    |                     |         |          |                     |
|    | b)        | State Cauchy's Integral theorem and applying it show that                                          | 6 Marks             | L2      | CO2      | PO1                 |
|    |           | $\int \frac{dz}{2(z^2+1)} = 0  \text{where}  C: 1 \le  z  \le 2.$                                  |                     |         |          |                     |
|    |           | $C_{C} z^{-} (z^{-} + 16)$                                                                         |                     |         |          |                     |

Analyzing the function  $f(z) = \frac{7z-2}{(z+1)(z)(z-2)}$ , identify the 7. 12 Marks L3 PO2 CO<sub>2</sub> regions in which the function can be expanded in Laurent series and expand it about point z = -1. (**OR**) 8. If f(z) is analytic in the region R and let P and Q be any two a) 6 Marks L1 CO<sub>2</sub> PO1 points in the region then show that  $\int_{P}^{U} f(z) dz$  is independent of the path joining P and Q. 6 Marks b) L2 CO<sub>2</sub> PO2 Construct a Taylor's series for  $f(z) = \frac{e^2}{z(z+1)}$  about the point z = 2.UNIT-V 9. complex variable technique, By using evaluate  $\int_{-\pi}^{\infty} \frac{x^2}{(x^2+1)(x^2+4)} dx.$ 12 Marks L3 CO<sub>2</sub> PO2 (**OR**) 10 12 Marks CO2 PO2 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 L3 technique of complex variable.

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|    |         | II B.Tech I Semester (SVEC-19) Supplementary Examina                                              | tions Aug    | ust - 2 | 021    |                           |
|    |         | CONSTRUCTION, PLANNING AND PROJECT MAN<br>[ Civil Engineering ]                                   | NAGEMEN      | T       |        |                           |
|    | Time: 3 | b hours                                                                                           |              | Max.    | Marks: | 60                        |
|    |         | Answer One Question from each Unit<br>All questions carry equal marks                             |              |         |        |                           |
|    |         |                                                                                                   |              |         |        |                           |
| 1. | a)      | What is bond with regard to brick masonry? Mention its types and explain.                         | 6 Marks      | L1      | CO1    | PO1<br>PO10               |
|    | b)      | Write short note on:<br>i) Doglegged stairs.<br>ii) Open newel half turn stairs.                  | 6 Marks      | L1      | CO1    | PO1<br>PO10               |
| 2. | a)      | (OR) List the types of arches and describe briefly.                                               | 6 Marks      | L2      | CO1    | PO1<br>PO2                |
|    | b)      | Describe queen post truss with neat sketch.                                                       | 6 Marks      | L2      | CO1    | PO10<br>PO1<br>PO10       |
|    |         | UNIT-II                                                                                           |              |         |        |                           |
| 3. | a)      | What is pointing? How is it carried out? What are its different types?                            | 6 Marks      | L3      | CO2    | PO1<br>PO5                |
|    | b)      | Illustrate the different types of paints and describe the process of painting on new wood.        | 6 Marks      | L3      | CO2    | PO1<br>PO5<br>PO7         |
| 4. | a)      | (OR)<br>Define formwork and elucidate the chief requirements of a good<br>formwork.               | 6 Marks      | L2      | CO2    | PO1<br>PO5                |
|    | b)      | What is shoring? Discuss different methods of shoring and state the safety precautions.           | 6 Marks      | L2      | CO2    | PO8<br>PO1<br>PO5<br>PO6  |
|    |         |                                                                                                   |              |         |        | 100                       |
| 5. | a)      | Discuss the different factors leading to accidents in construction projects.                      | 6 Marks      | L2      | CO3    | PO1<br>PO2                |
|    | b)      | Explain ABC classification of materials and inventory of materials.                               | 6 Marks      | L4      | CO3    | PO6<br>PO1<br>PO2<br>PO5  |
| 6. | a)      | (OR)<br>List out of the salient features of Minimum Wages Act of 1948                             | 6 Marks      | L2      | CO3    | PO1                       |
|    | ,       | and Workman compensation act of 1923.                                                             |              |         |        | PO6<br>PO8                |
|    | b)      | Distinguish between line and functional organization.                                             | 6 Marks      | L4      | CO3    | PO1<br>PO2<br>PO5<br>PO11 |

|    |     |                                                                                                                                  |                |                    |                  |                            | UNIT                   | -IV               | )             |        |            |    |         |                           |
|----|-----|----------------------------------------------------------------------------------------------------------------------------------|----------------|--------------------|------------------|----------------------------|------------------------|-------------------|---------------|--------|------------|----|---------|---------------------------|
| 7. | a)  | Write a sh controlling.                                                                                                          | ort            | note               | on pr            | oject pl                   | anning                 | g, sch            | eduli         | ng ar  | d 6 Marks  | L2 | CO4     | PO1<br>PO11               |
|    | b)  | Discuss varion what are reduced                                                                                                  | ous r<br>undar | ules fo<br>it dumi | or prov<br>mies. | viding du                  | ummies                 | s in a            | netw          | ork ar | nd 6 Marks | L3 | CO4     | PO1<br>PO2<br>PO6<br>PO10 |
|    |     |                                                                                                                                  |                |                    |                  |                            | (OF                    | C)                |               |        |            |    |         | 1010                      |
| 8. | a)  | Write down t                                                                                                                     | the st         | eps inv            | volved           | in the de                  | velopr                 | nent of           | f bar o       | chart. | 6 Marks    | L1 | CO4     | PO1<br>PO5                |
|    | b)  | Define work<br>diagram for r                                                                                                     | ee 6 Marks     | L2                 | CO4              | PO1<br>PO5<br>PO10<br>PO11 |                        |                   |               |        |            |    |         |                           |
|    |     |                                                                                                                                  |                |                    |                  | C                          | UNI                    | Г-V               | )             |        |            |    |         |                           |
| 9. | a)  | Define the te                                                                                                                    | rms.           |                    |                  | _                          |                        |                   |               |        | 6 Marks    | L1 | CO5     | PO1                       |
|    | u)  | i) S<br>iii) F                                                                                                                   | lack.<br>ree F | loat.              |                  | ii)<br>iv                  | Total<br>) Critic      | Float.<br>cal Pat | h.            |        | 0 munio    | 21 | 000     | 101                       |
|    | 1 \ | v) Ir                                                                                                                            | ndepe          | ndent              |                  | <b>T</b> (                 |                        | DO 1              |               |        |            |    |         |                           |
|    | b)  | PERT network diagram Identify various naths Identify the                                                                         |                |                    |                  |                            |                        |                   |               |        |            | L6 | CO5     | POI                       |
|    |     | Critical nath                                                                                                                    | лк u<br>Tał    | nulate             | the co           | mnutati                    | nous p                 | valuate           | e the         | nroie  | et         |    |         | PO2                       |
|    |     | time.                                                                                                                            | . 140          | Julute             | the et           | Sinputation                | 5115. L                | varuut            | e the         | proje  |            |    |         | PO4                       |
|    |     | Activity                                                                                                                         | 1-2            | 1-3                | 2-4              | 2-5 4-                     | 7 5-7                  | 7-8               | 3-6           | 6-8    |            |    |         | PO5                       |
|    |     | Duration                                                                                                                         | 1 2            | 1.5                | 2 1              |                            |                        | / 0               | 50            | 00     |            |    |         | PO10                      |
|    |     | in days                                                                                                                          | 5              | 10                 | 1                | 6 12                       | 2 3                    | 4                 | 7             | 6      |            |    |         | PO11                      |
|    |     |                                                                                                                                  | 2              |                    |                  |                            | (OF                    | R)                |               |        |            |    | <b></b> | DOA                       |
| 10 |     | The activitie                                                                                                                    | a proj         | k 12 Marks         | L6               | CO5                        | POI                    |                   |               |        |            |    |         |                           |
| •  |     | diagram and find out the critical path. Find the completion time<br>of the project Colculate EST, EET, LST, LST, and more in the |                |                    |                  |                            |                        |                   |               |        |            |    |         | PO2<br>PO3                |
|    |     | diagram calc                                                                                                                     |                |                    |                  | PO4                        |                        |                   |               |        |            |    |         |                           |
|    |     |                                                                                                                                  | -              | Durati             | ion in           | Acti                       | Activities immediately |                   |               |        |            |    |         | PO5                       |
|    |     | Activity                                                                                                                         | -              | da                 | vs               | Prece                      | ding                   | Foll              | lowin         | σ      |            |    |         | PO10                      |
|    |     | Α                                                                                                                                |                | 3                  |                  | -                          | ung                    |                   | 3.C           | 5      |            |    |         | PO11                      |
|    |     | B                                                                                                                                |                | 4                  |                  | A                          |                        |                   | D             |        |            |    |         |                           |
|    |     | С                                                                                                                                |                | 6                  |                  | A                          |                        |                   | D             |        |            |    |         |                           |
|    |     | D                                                                                                                                |                | 3                  |                  | В,                         | С                      | I                 | D,E           |        |            |    |         |                           |
|    |     | E                                                                                                                                |                | 6                  |                  | 0                          | /                      |                   | G             |        |            |    |         |                           |
|    |     | F                                                                                                                                |                | 4                  |                  | <u> </u>                   | )                      |                   | I             |        |            |    |         |                           |
|    |     | G                                                                                                                                |                | 5                  |                  | E                          | <u>,</u>               |                   | H,J           |        |            |    |         |                           |
|    |     |                                                                                                                                  |                | 3                  |                  |                            |                        |                   | 1<br>T        |        |            |    |         |                           |
|    |     | I<br>T                                                                                                                           |                | 0<br>/             |                  |                            | 11<br>}                |                   | <u>г</u><br>К |        |            |    |         |                           |
|    |     | K K                                                                                                                              |                |                    |                  |                            |                        |                   | L             |        |            |    |         |                           |
|    |     |                                                                                                                                  |                |                    |                  |                            |                        |                   |               |        |            |    |         |                           |
|    |     |                                                                                                                                  | I              |                    |                  |                            |                        | 1                 |               |        |            |    |         |                           |

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**CODE No.: 19BT30102** SVEC-19 Roll No. SREE VIDYANIKETHAN ENGINEERING COLLEGE (An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu) II B.Tech I Semester (SVEC-19) Supplementary Examinations 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 Explain briefly about surface tension and capillarity. 1. 6 Marks L2 CO1 PO1 a) PO10 b) The space between two square flat parallel plates is filled with 6 Marks L4 CO1 PO1 oil. Each side of the plate is 720mm. The thickness of the oil film PO2 is 15mm. The upper plate, which moves at 3m/s requires a force PO4 of 120 N to maintain the speed. Determine: **PO10** i) The dynamic viscosity of the oil. ii) The kinematic viscosity of oil if the specific gravity of oil is 0.95 (**OR**) Derive expressions for total pressure and center of pressure for a 2. 6 Marks L4 CO1 PO1 a) vertically immersed surface. PO2 **PO10** CO1 A circular plate 3 m in diameter is submerged in water in such a 6 Marks L4 PO1 b) way that the greatest and least depths of the surface (below water PO2 surface) are 2 m and 1 m respectively, calculate: PO4 i) The total pressure on front face of the plate. **PO10** ii) The position of center of pressure. UNIT-II i) Distinguish between path lines, stream lines, stream tube and CO<sub>2</sub> PO1 3. a) 6 Marks L4 streak lines. PO2 ii) The diameters of a pipe at the sections 1-1 and 2-2 are 200mm **PO10** 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. Velocity for a two dimensional flow field is given by b) 6 Marks  $\mathbf{I4}$ CO<sub>2</sub> **PO1**  $V = (3 + 2xy + 4t^2) i + (xy^2 + 3t) j$ . Find the velocity and PO2 acceleration at a point (1,2) after 2 sec. (**OR**) State and prove Bernoulli's equation. List the assumptions which 4 6 Marks PO1 a)  $\mathbf{I4}$ CO<sub>2</sub> are made while deriving Bernoulli's equation. PO2 PO5 **PO10** b) Water is flowing at the rate of 40 liters/sec through a tapering 6 Marks L4 CO2 PO1 pipe. The diameters at the bottom and upper ends are 300mm and PO2 200mm respectively. If the intensities of pressure at the bottom PO4 and upper ends are 250 kN/m<sup>2</sup> and 100 kN/m<sup>2</sup> respectively, find PO10 the difference in datum head.

UNIT-III 5. State the difference between a wholly submerged orifice and a 6 Marks CO3 PO1 L4 a) partially submerged orifice. Derive an expression for discharge PO2 through fully submerged orifice. PO10 A convergent-divergent mouthpiece is fitted to the side of a tank. 6 Marks CO3 b) L4 PO1 It is discharging 5.5 liters/sec of water under a constant head of PO2 2.0 m. If the head lost in the divergent portion is  $1/10^{\text{th}}$  of the PO4 kinetic head at outlet and the separation pressure is 2.5m, find the **PO10** throat and exit diameters. Take atmospheric pressure = 10.3m of water. (**OR**) 6. Explain the following terms: 6 Marks L2 CO3 PO1 a) i) Notch. ii) Weir. PO10 iii) Nappe or vein. iv) Sill or crest. Water is to be supplied to the inhabitants of a college campus 6 Marks L6 CO<sub>4</sub> PO1 b) through a supply main. The following data is given: **PO2** Distance of the reservoir from the campus = 3000 m, Number of PO3 inhabitants = 4000, Consumption of water per day of each PO4 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. UNIT-IV Explain Reynolds's experiment with a neat sketch and list out the 7. 6 Marks CO5 a) L2 PO1 characteristics of laminar flow. PO10 Derive an expression for flow of viscous fluid in circular pipes L4 CO5 b) 6 Marks PO1 with assumptions. PO2 (**OR**) 8. Distinguish between hydrodynamically smooth and rough CO5 PO1 a) 6 Marks L2 boundaries. PO2 PO4 b) For turbulent flow in a pipe of diameter 200mm, find the 6 Marks L4 CO5 PO1 discharge when the center line velocity is 30 m/s and velocity at PO2 a point 80mm from the center as measured by pitot tube is 2 m/s. PO4 UNIT-V 9. Define Buckingham pi theorem. The thrust force P developed by 12 Marks CO6 PO1 I.4a propeller depends on the angular velocity  $\omega$ , speed of advance PO2 V, diameter D, dynamic viscosity  $\mu$ , mass density  $\rho$ , elasticity of PO4 fluid medium which can be denoted by the speed of sound C with PO5 unit m/s. Obtain an expression for P by Buckingham pi theorem. (**OR**) 10 List different model laws with scale ratios. In the model test of a 12 Marks L4 CO6 PO1 spillway the discharge and velocity of flow over the model were PO2 2.5 cumecs and 1.5 m/s respectively. Calculate the velocity and PO4 discharge over the prototype which is 36 times the model size. PO5

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Time: 3 hours

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PO<sub>6</sub>

**PO10** 

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### [ Civil Engineering ]

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 12 Marks PO1 L4 CO1 simply supported beam carrying a concentrated load 'W' placed **PO2** eccentrically on the span. Draw SFD and BMD PO4 (**OR**) 2 A beam AB 10m long is simply supported at its ends A and B 12 Marks  $\mathbf{I4}$ CO1 PO1 and has an overhang BC of length 2m, it carries uniformly PO<sub>2</sub> distributed load of 30 kN/m for a distance of 4m from the left PO4 end A and a concentrated load of 50 kN and 30 kN at a distance **PO10** 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. UNIT-II) 3. Determine the dimensions of joist of a timber of span 6 Marks L6 CO<sub>2</sub> PO1 a) 8m to carry a brick wall 210mm thick and 5m high. If the density PO<sub>2</sub> of brick work is 1850 kg/m<sup>3</sup> and the maximum permissible stress PO<sub>3</sub> is limited to 7.5  $MN/m^2$ . Given that the depth of the joist is twice **PO4** the width. PO10 **b**) A laminated wood beam 10cm wide and 15cm deep is made up 6 Marks L5 CO<sub>2</sub> PO1 of three 5 x 10cm wide planks glued together to resist **PO2** longitudinal shear. The beam is simply supported over a span of PO4 2m. If the allowable shearing stress in the glued joint is PO<sub>6</sub>  $0.45 \text{ MN/m}^2$ , find the safe concentrated load that the beam may PO10 carry at its centre. (**OR**) A masonry pier of 3m x 4m supports a load of 40 kN as shown in 4. 12 Marks L4 CO<sub>3</sub> PO1 the figure. **PO2** 
  - 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?



# (UNIT-III)

| 5. | a) | A solid shaft 120 mm in diameter transmits 120 kW at 160 r.p.m.<br>Find the maximum shear stress induced in the shaft. Find also the<br>angle of twist in a length of 7.5m. Take C=8 x $10^4$ N/mm <sup>2</sup> .                                                                                                                          | 6 Marks   | L5         | CO4     | PO1<br>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/m <sup>2</sup> 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<br>PO2<br>PO3<br>PO4<br>PO6  |
| ~  |    | (OR)                                                                                                                                                                                                                                                                                                                                       |           | <b>.</b> . | <i></i> | <b>D</b> O1                      |
| 6. | a) | Derive the shear stress and deflection of a close coiled helical spring subjected to axial twist.                                                                                                                                                                                                                                          | 6 Marks   | L4         | CO4     | PO1<br>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/m <sup>2</sup> .                                                                                      | 6 Marks   | L6         | CO4     | PO1<br>PO2<br>PO3<br>PO4<br>PO6  |
|    |    | (UNIT-IV)                                                                                                                                                                                                                                                                                                                                  |           |            |         |                                  |
| 7. | a) | Draw the Mohr's stress circle for the direct stresses of 100 N/mm <sup>2</sup> (tensile) and 40 N/mm <sup>2</sup> (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<br>PO2<br>PO6<br>PO10        |
|    | b) | At a point in the web of a girder the bending stress is 70 N/mm <sup>2</sup> (tensile) and the shearing stress at the same point is 30 N/mm <sup>2</sup> . Calculate the principal stresses at that point.                                                                                                                                 | 6 Marks   | L4         | CO5     | PO1<br>PO2<br>PO6<br>PO10        |
| 0  |    | (UR)                                                                                                                                                                                                                                                                                                                                       | 12 Martra | 14         | CO2     |                                  |
| 0. |    | A shart 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 $160 \text{ MN/m}^2$ , find the diameter of the shaft according to maximum shear strain energy theory.                                                         | 12 Marks  | LO         | 02      | PO1<br>PO2<br>PO3<br>PO6<br>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<br>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<br>PO2<br>PO5<br>PO6         |

# (OR)

10.

| From the following data of a column of circular section calculate         | 12 Marks | L4 | CO6 | PO1 |
|---------------------------------------------------------------------------|----------|----|-----|-----|
| the extreme stresses on the column section. Also find the                 |          |    |     | PO2 |
| maximum eccentricity in order that there may be no tension                |          |    |     | PO5 |
| anywhere on the section.                                                  |          |    |     | PO6 |
| External diameter = $20 \text{ cm}$                                       |          |    |     |     |
| Internal diameter = $16 \text{ cm}$                                       |          |    |     |     |
| Length of the column = $4 \text{ m}$                                      |          |    |     |     |
| Load carried by the column = $200 \text{ kN}$                             |          |    |     |     |
| Eccentricity of the load = $2.5 \text{ cm}$ (from the axis of the column) |          |    |     |     |
| Young's modulus = $94 \text{ GN/m}^2$                                     |          |    |     |     |
|                                                                           |          |    |     |     |

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Roll No.

**SVEC-19** 

#### 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 CO1 1. a) Differentiate clearly between plane and geodetic surveying. 4 Marks L4 PO1 PO<sub>2</sub> What is the sag correction for a 30m steel tape under a pull of 5 Marks I.4 CO1 PO1 **b**) 100N in three equal spans of 10m each? Unit weight of steel is **PO2** 78.9 kN/m<sup>3</sup> and Area of cross section of tape is 8 mm<sup>2</sup>. How do surveying influences the environment? How ethics is 3 Marks CO1 c) L3 PO1 important in surveying practice? PO7 (**OR**) A line AC had the magnetic azimuth of 67°15' in 1960. If the 2. 6 Marks CO1 PO1 a) L4 magnetic declination was found to be 21°30'E by interpolation **PO2** from an isogonic chart dated 1950 with an annual change of 1' westward. Determine the true azimuth of line AC. Explain the procedure for conducting compass survey along the b) 6 Marks CO1 PO1 L4 closed traverse. PO8 UNIT-II What is three point problem? How is it solved by tracing paper 3. 6 Marks L3 CO1 PO1 a) method? PO10 **b**) What are the various methods of leveling? Describe them briefly. 6 Marks L2 CO<sub>2</sub> PO1 PO5 (**OR**) 6 Marks Describe in short the curvature and refraction. L3 4. a) CO<sub>2</sub> PO1 **PO10** Describe the various characteristics and uses of contour lines. 6 Marks L3 CO2 PO1 **b**) PO10 (UNIT-III) 5. What are the precautions to be decided while using a theodolite? 5 Marks L2 CO3 PO1 a) PO5 PO6 How is a closed traverse checked in the field? What do you mean 7 Marks L4 CO3 PO1 **b**) by "Balancing a traverse"? PO<sub>2</sub> (**OR**) Derive distance equation for staff vertical condition and explain 5 Marks  $\mathbf{I.4}$ CO3 PO1 6. a) the role of anallactic lens in stadia tacheometry. **PO2** PO5 The following set of readings refers to observations in a 7 Marks L4 CO3 PO1 b) tacheometry survey from station B on stations C and D in clock-PO2 wise direction. PO4 Staff Vertical Horizontal PO10 Stadia hair readings angle circle angle station  $-5^{\circ}12'$ 152°56' С 1.044, 2.283, 3.522

0.645, 2.376, 4.110

 $+2^{\circ}30'$ 

D

205°06'

Calculate the distance between C and D.

| C | IIN | TT-   | τv  | 7 |
|---|-----|-------|-----|---|
|   |     | T I - | T A | ר |

| 7.  | a) | The following perpendicular offsets were taken at 10m intervals<br>from a chain line to an irregular boundary line:<br>3.10, 4.20, 5.35, 6.45, 7.15, 8.25, 7.95 and 5.20 m. find the area:<br>Trapezoidal rule and Simpson's rule.                                                                                                                               | 6 Marks | L4 | CO4            | PO1<br>PO2<br>PO5                |
|-----|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----|----------------|----------------------------------|
|     | b) | Derive an expression for volume by the prismoidal formula.                                                                                                                                                                                                                                                                                                       | 6 Marks | L4 | CO4            | PO1<br>PO2<br>PO5                |
|     |    | (OR)                                                                                                                                                                                                                                                                                                                                                             |         |    |                |                                  |
| 8.  | a) | What are the elements of a simple circular curve? What are unit and sub chords?                                                                                                                                                                                                                                                                                  | 4 Marks | L3 | CO5            | PO1<br>PO10                      |
|     | b) | Two tangents intersect at a point B of chainage 25.33m. The deflection angle being 36 <sup>0</sup> . 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<br>PO2<br>PO3<br>PO5<br>PO10 |
| _   |    |                                                                                                                                                                                                                                                                                                                                                                  |         |    |                |                                  |
| 9.  | a) | List out the various modern electronic equipment used in surveying. Explain them in detail.                                                                                                                                                                                                                                                                      | 6 Marks | L2 | CO6            | PO1<br>PO5                       |
|     | •  |                                                                                                                                                                                                                                                                                                                                                                  |         |    | ~ ~ ~ <i>(</i> | PO12                             |
|     | b) | How to determine the area of a piece of land using total station?                                                                                                                                                                                                                                                                                                | 6 Marks | L4 | CO6            | PO1<br>PO2<br>PO5                |
|     |    | (OR)                                                                                                                                                                                                                                                                                                                                                             |         |    |                |                                  |
| 10. | a) | Write a short note on benefits of drones in surveying and applications of drone surveying.                                                                                                                                                                                                                                                                       | 6 Marks | L3 | CO6            | PO1<br>PO5<br>PO12               |
|     | b) | Explain the procedure for the calculation of length in drone surveying.                                                                                                                                                                                                                                                                                          | 6 Marks | L4 | CO6            | PO1<br>PO2<br>PO5<br>PO12        |
|     |    |                                                                                                                                                                                                                                                                                                                                                                  |         |    |                |                                  |

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|    | CODE     | No.: 19BT30202                                                                                                                                              |                    |            | SVE    | <u>C-19</u> |
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|    |          | SREE VIDYANIKETHAN ENGINEERING COU                                                                                                                          | LEGE               |            |        |             |
|    |          | (An Autonomous Institution, Affiliated to JNTUA, Ananthapur                                                                                                 | amu)               |            | 0.3.1  |             |
|    |          | II B.Tech I Semester (SVEC-19) Supplementary Examina                                                                                                        | tions Augu         | 1st – 2    | 021    |             |
|    |          | ELECTROMAGNETIC FIELDS                                                                                                                                      |                    |            |        |             |
|    |          | [ Electrical and Electronics Engineering ]                                                                                                                  |                    |            |        |             |
|    | Time: 3  | hours                                                                                                                                                       |                    | Max.       | Marks: | 50          |
|    |          | Answer One Question from each Unit                                                                                                                          |                    |            |        |             |
|    |          | An questions carry equal marks                                                                                                                              |                    |            |        |             |
|    |          | UNIT-I                                                                                                                                                      |                    |            |        |             |
| 1. | a)       | State and explain Coulomb's law in vector form.                                                                                                             | 6 Marks            | L2         | CO1    | PO          |
|    | b)       | Calculate the total flux leaving the cubical surface formed by the                                                                                          | 6 Marks            | L3         | CO1    | PO2         |
|    |          | six planes x, y, $z = \pm 5$ when<br>i) two point charges 0.1 uC at $A(1 - 2, 2)$ and 0.5 uC at                                                             |                    |            |        |             |
|    |          | 1) two point energies, 0.1 $\mu$ C at A(1, -2, 5) and 0.5 $\mu$ C at B(-1, 2, -2)                                                                           |                    |            |        |             |
|    |          | ii) a uniform line charge of 5 $\mu$ C/m at x=-2, y=3.                                                                                                      |                    |            |        |             |
|    |          | (OR)                                                                                                                                                        |                    |            |        |             |
| 2. | a)       | Using Gauss's law, obtain the expression for electric field                                                                                                 | 6 Marks            | L3         | CO1    | PO          |
|    | h)       | intensity due to an infinite sheet of charge.<br>Let Detential $V=2yy^2r^3$ and $a=a$ . Given the point $P(1,2,-1)$ then                                    | 6 Mortra           | т 2        | COL    |             |
|    | 0)       | Let Potential, $\mathbf{v} - 2\mathbf{x}\mathbf{y} \mathbf{z}$ and $\mathbf{\varepsilon} - \mathbf{\varepsilon}_0$ Given the point $P(1,2,-1)$ then, find : | 0 Marks            | L3         | COI    | PU.         |
|    |          | i) Potential at P. ii) Electric field intensity at P.                                                                                                       |                    |            |        |             |
|    |          | UNIT-II)                                                                                                                                                    |                    |            |        |             |
| 3. | a)       | Derive the boundary conditions of the normal and tangential                                                                                                 | 6 Marks            | L2         | CO1    | PO          |
|    |          | components of electric field at the interface of two media with                                                                                             |                    |            |        |             |
|    | 1 \      | different dielectrics.                                                                                                                                      |                    | т 2        | 001    | DO          |
|    | b)       | I wo extensive homogeneous isotropic dielectrics meet on plane $=0$ . For $= 0$ , $= -4$ and for $= -2$ . A uniform electric field                          | 6 Marks            | L3         | COI    | PO          |
|    |          | $\vec{z}$ = 0. For $\vec{z}$ > 0, $\vec{\varepsilon}_{r1}$ = 4 and for $\vec{z}$ < 0, $\vec{\varepsilon}_{r2}$ = 3. A uniform electric field                |                    |            |        |             |
|    |          | $E_1 = 5a_x - 2a_y + 3a_z$ exists for $z \ge 0$ . Determine:                                                                                                |                    |            |        |             |
|    |          | i) $\vec{E}_2$ for $z \le 0$ ,                                                                                                                              |                    |            |        |             |
|    |          | 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)                                                                                                                                                   |                    |            |        |             |
|    |          | (0, +, -3).<br>(OR)                                                                                                                                         |                    |            |        |             |
| 4. | a)       | Explain in detail about polarization effects induced in dielectric                                                                                          | 6 Marks            | L2         | CO1    | PO          |
|    |          | due to electric field.                                                                                                                                      |                    |            |        |             |
|    | b)       | An electric dipole located at the origin in free space has a                                                                                                | 6 Marks            | L3         | CO1    | PO2         |
|    |          | moment $p = (4a_x + 3a_y + 2a_z)nCm$ Determine:                                                                                                             |                    |            |        |             |
|    |          | i) Potential, V at point $Q(1,2,3)$ .                                                                                                                       |                    |            |        |             |
|    |          | 11) Electric field intensity at $Q(4, 20^\circ, 0^\circ)$ .                                                                                                 |                    |            |        |             |
| 5  |          | State and many Amnany's simulation in which forms                                                                                                           | (Marl-             | τ <b>^</b> | CO2    | DO          |
| э. | a)<br>b) | State and prove Ampere's circuital law in point form.<br>Using ampere's law compute $\vec{u}$ in the cylindrical ragion                                     | 0 Marks<br>6 Marks | L2<br>L3   | CO2    | PO1<br>PO4  |
|    | 0)       | Osing amperes law, compute $H$ in the cylindrical region<br>$0 < 0 < 0.5m$ the automatic density is $\vec{L} = 4.5 z^{-20} \vec{z} = 4.1 z^{-2}$            | U IVIAINS          |            | 002    | 10.         |
|    |          | $v > p > 0.5m$ , the current density is , $J = 4.5e^{-r} a_z A/m^2$                                                                                         |                    |            |        |             |

and zero elsewhere.

# (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<br>A and B separated by 10 cm in air and carrying currents of 20A.<br>i) in the same direction.<br>ii) in the opposite direction.                   | 6 Marks | L3  | CO2 | PO2 |
| -  | `` | UNII-IV                                                                                                                                                                                                             |         | x 0 |     | DOI |
| 1. | a) | Derive an expression for force between two straight long parallel<br>current carrying conductors. What will be the nature of force, if<br>the current is carrying in the same direction and opposite<br>directions? | 6 Marks | L3  | 02  | POI |
|    | 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                                                                                 | 6 Marks | L3  | CO2 | PO2 |
|    |    | $\vec{B} = 3.5 \times 10^{-3} (\vec{a}_x - \vec{a}_y)$ Tesla where $\vec{a}_x$ and $\vec{a}_y$ are unit                                                                                                             |         |     |     |     |
|    |    | vectors                                                                                                                                                                                                             |         |     |     |     |
|    |    | (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                                                                                                                                                            | 6 Marks | L3  | CO2 | PO2 |
|    |    | $\vec{u} = 7\vec{a}_x + 4\vec{a}_y - 6\vec{a}_z m/s$ , 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 $\vec{B} = 6\vec{a}_x + 5\vec{a}_y + 6\vec{a}_z \ wb/m^2.s$                                                                                                                              |         |     |     |     |
|    |    | 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                                                                                                                               | 6 Marks | L3  | CO3 | PO2 |
|    |    | 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. <b>(OR)</b>                                                             |         |     |     |     |
| 10 | a) | Show that in a capacitor, the conduction current and                                                                                                                                                                | 6 Marks | L2  | CO3 | PO1 |
|    | ,  | displacement currents are equal.                                                                                                                                                                                    |         |     |     |     |
|    | b) | Explain the following with practical examples.                                                                                                                                                                      | 6 Marks | L2  | CO3 | PO1 |
|    |    | i) Motional EMF. ii) Transformer EMF.                                                                                                                                                                               |         |     |     |     |
|    |    | \$\$ \$\$ \$\$                                                                                                                                                                                                      |         |     |     |     |



## UNIT-I

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



b) Determine whether the following signal is periodic or not. If 6 Marks L3 CO1 PO2 periodic find the fundamental frequency.

$$x[n] = \cos\left(\frac{\pi}{8}n\right)\sin\left(\frac{\pi}{4}n\right).$$

(OR)

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



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

#### UNIT-II

- 3. a) Distinguish between Fourier series and Fourier transforms. 4 Marks L2 CO2 PO1
  - b) Find the voltage  $V_0(t)$  in the circuit shown in figure using Fourier 8 Marks L3 CO2 PO2 transforms, if  $i_s(t) = 8e^{-t} u(t)$ .



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



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 6 Marks L3 CO2 PO2 system described by: y[n] - 2y[n-1] - 3y[n-2] = x[n-1].

(OR)

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

signal  $x[n] = -u[-n-1] + \left(\frac{1}{2}\right)^n u[n].$ 

condition.

# UNIT-IV

7. What is the significance of time constant of R-L circuit? What 4 Marks L2 CO3 PO1 a) are the different ways of defining time constant? A Sinusoidal Voltage of  $V(t) = 12 \sin 8t$  Volts is applied at t = 08 Marks L3 CO3 b) PO5 to a RL series of R=  $4\Omega$  and L = 1 H. By Laplace transform method determine the circuit current I (t). Assume zero initial

#### (OR)

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

L3

CO3

PO5

b) For the circuit given in Figure steady state conditions are reached 8 Marks 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.



# UNIT-V

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



(OR)

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



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Roll No.

SVEC-19

# SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### **ENGINEERING THERMODYNAMICS**

| ŗ  | Fim 2    | [ Mechanical Engineering ]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |         | Mar  | Manhard  | 60                |
|----|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------|----------|-------------------|
|    | I Ime: 3 | Answer One Question from each Unit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         | Max. | Marks: 0 | 50                |
|    |          | 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:<br>i) Thermodynamic equilibrium.<br>ii) Reversible process and irreversible process.<br>iii) Homogeneous and heterogeneous system.<br>(OR)                                                                                                                                                                                                                                                                                                                                                     | 6 Marks | L2   | CO1      | PO1               |
| 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 :                                                                                           | 6 Marks | L3   | CO1      | PO1<br>PO2<br>PO3 |
|    |          | <ul> <li>i) Rate of heat transfer to the air in the heat exchanger.</li> <li>ii) The power output from the turbine assuming no heat loss.</li> <li>iii) The velocity at exit from the nozzle, assuming no heat loss.</li> <li>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.</li> </ul>                                                                                                                                                            |         |      |          |                   |
|    |          | (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:<br>i) The rate of heat supply from the 840°C source.<br>ii) The rate of heat rejection to the 60°C sink | 6 Marks | L3   | CO1      | PO1<br>PO2        |
|    |          | I) The face of heat rejection to the $60^{\circ}$ C sink.                                                                                                                                                                                                                                                                                                                                                                                                                                                            |         |      |          |                   |
| 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<br>is in equilibrium at a temperature of 20°C. An experimenter now<br>places 0.05 kg of ice at 0°C in the calorimeter and encloses the latter<br>with a heat insulating shield.<br>i) When all the ice has melted and equilibrium has been                                                                                                                                                                                                       | 6 Marks | L3   | CO1      | PO1<br>PO2        |
|    |          | can? The specific heat of copper is 0.418 kJ/kg K and<br>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?

# 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°C. 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<br>PO2 |
| 6  | a)        | (UK)<br>Derive Tds relations in terms of temperature and pressure                                                                                                                                              | 6 Marks  | 13 | CO1 | PO1        |
| 0. | <i>a)</i> | changes and temperature and volume changes.                                                                                                                                                                    | 0 WIGINS | ĽJ | COI | PO2        |
|    | b)        | Show that the Joule-Thomson coefficient of an ideal gas is zero.                                                                                                                                               | 6 Marks  | L3 | CO1 | PO1<br>PO2 |
|    |           |                                                                                                                                                                                                                |          |    |     | -          |
| 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:                                                                                                                                                                                           | 6 Marks  | L2 | CO3 | PO1        |
|    |           | i) Mole fraction and Mass fraction                                                                                                                                                                             |          |    |     |            |
|    | 1.)       | 11) Gravimetric Analysis and Volumetric Analysis.                                                                                                                                                              |          | тэ | COL | DO 1       |
|    | D)        | A vessel having a volume of 0.0m <sup>2</sup> contains 3.0 kg of liquid                                                                                                                                        | 6 Marks  | L3 | 003 |            |
|    |           | 0.5 MPa Calculate :                                                                                                                                                                                            |          |    |     | r02        |
|    |           | i) Mass and volume of liquid                                                                                                                                                                                   |          |    |     |            |
|    |           | ii) Mass and volume of vapour.                                                                                                                                                                                 |          |    |     |            |
|    |           | UNIT-V                                                                                                                                                                                                         |          |    |     |            |
| 9. | a)        | Derive the expression to find the efficiency of air standard dual                                                                                                                                              | 6 Marks  | L3 | CO4 | PO1        |
|    | <i>,</i>  | cycle with the help of p-v and t-s diagram                                                                                                                                                                     |          |    |     |            |
|    | b)        | An I.C engine operating on the dual cycle (limited pressure                                                                                                                                                    | 6 Marks  | L3 | CO4 | PO1        |
|    |           | cycle) the temperature of the working fluid (air) at the beginning                                                                                                                                             |          |    |     | PO2        |
|    |           | 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 neat added at constant volume and at constant                                                                                                                                                       |          |    |     |            |
|    |           | of the cycle. State three main reasons why the actual thermal                                                                                                                                                  |          |    |     |            |
|    |           | efficiency is different from the theoretical value. Take $\gamma$ for $\sin z = 1.4$                                                                                                                           |          |    |     |            |
|    |           | an = 1.4. (OP)                                                                                                                                                                                                 |          |    |     |            |
| 10 | a)        | Write the assumption in air standard cycles                                                                                                                                                                    | 6 Marks  | L2 | CO4 | PO1        |
| 10 | u)        | white the assumption in an standard cycles.                                                                                                                                                                    | o muno   |    | 007 | 101        |

b) Derive an expression for the thermal efficiency of Diesel cycle 6 Marks L3 CO4 PO1 and draw P-V and T-S diagrams. 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

## **KINEMATICS OF MACHINERY**

[ Mechanical Engineering ]

|    | Time: 3 hours |                                                                                                                                                                                                                                                                                                                                                                                                                               |          |          |       | 50                |
|----|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|-------|-------------------|
|    |               | Answer One Question from each Unit<br>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. (OR)                                                                                                                                                                                                                                                                                                                                                                     | 6 Marks  | L2       | CO1   | PO1               |
| 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<br>mathematically correct straight line motion. Sketch and explain<br>The Hart's straight line motion mechanism.                                                                                                                                                                                                                                                             | 12 Marks | L3       | CO2   | PO1<br>PO2        |
|    |               | (OR)                                                                                                                                                                                                                                                                                                                                                                                                                          |          |          | ~ ~ • |                   |
| 4. |               | Prove that the ratio of the angular velocities of the driven and driving shafts of Hooke's is given by $\frac{\omega_2}{\omega} = \frac{\cos \alpha}{1 - \cos^2 \alpha \sin^2 \alpha}$ .                                                                                                                                                                                                                                      | 12 Marks | L3       | CO3   | PO1<br>PO2        |
|    |               | $w_1 = \cos \theta \sin u$                                                                                                                                                                                                                                                                                                                                                                                                    |          |          |       |                   |
| _  |               |                                                                                                                                                                                                                                                                                                                                                                                                                               | 10361    | <b>.</b> |       | DOI               |
| 5. |               | The following data refers to two mating 20° involute gears.<br>Number of teeth on pinion is 20. Gear ratio = 2. Speed of pinion<br>is 250 r.p.m. Module = 12mm. If the addendum of each wheel is<br>such that the path of approach and path of recess on each side are<br>half of the maximum permissible length, find :<br>i) The addendum of pinion and gear.<br>ii) The length of arc of contact.                          | 12 Marks | L4       | CO4   | POI<br>PO2<br>PO3 |
|    |               | (OR)                                                                                                                                                                                                                                                                                                                                                                                                                          |          |          |       |                   |
| 6. |               | <ul> <li>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.</li> <li>Determine the speed of gear P for the following conditions: <ol> <li>i) If gear S is fixed.</li> <li>ii) The gear S rotates at 180 rpm counter clockwise instead of being fixed.</li> </ol> </li> </ul> | 12 Marks | L4       | CO4   | PO1<br>PO2<br>PO3 |
|    |               |                                                                                                                                                                                                                                                                                                                                                                                                                               |          |          |       |                   |

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|    | (UNIT-IV)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |          |     |     |                   |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----|-----|-------------------|
| 7. | <ul> <li>Draw the profile of a cam operating a knife edge follower from the following data: <ol> <li>Follower to move outward through 40 mm during 60° of a cam rotation.</li> <li>Follower to dwell for the next45°.</li> <li>Follower to return its original position during next 90°.</li> <li>Follower to dwell for the rest of the cam rotation.</li> </ol> </li> <li>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.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 12 Marks | L3  | CO5 | PO1<br>PO2<br>PO3 |
|    | (OR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |          |     |     |                   |
| 8. | Draw the profile of the cam operating a roller reciprocating follower and with the following data:<br>Minimum radius of the cam = 25mm, lift = 30mm, roller diameter = 15mm. The cam lifts the follower for 120 <sup>o</sup> with SHM followed by dwell period of 30 <sup>o</sup> . Then the follower lowers down during 150 <sup>o</sup> 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<br>PO2<br>PO3 |
| 9. | A four bar mechanism ABCD is made of four links. AD is fixed<br>link which is 180mm long. The links AB, BC and CD are 90mm,<br>120mm and 120mm respectively. At a certain instant, the link<br>AB makes 69 <sup>o</sup> with link AD. If link AB rotates at uniform speed<br>of 120 r.p.m, find:<br>i) Angular velocities of links BC and CD.<br>ii) Velocity of B and C.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 12 Marks | L4  | CO6 | PO1<br>PO2<br>PO3 |
| 10 | $\mathbf{U} = \mathbf{U} + $ | 12 1 1   | т 4 | 000 |                   |

10 Locate all the instantaneous centres of the slider crank PO1 12 Marks L4 CO6 mechanism shown in following figure. The lengths of crank OB PO2 and connecting rod AB are 100mm and 400mm respectively. If PO3 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.



(P) ÷ (P)

|    | CODE        | No.: 19BT30303                                                                                 | <b></b>  | <del></del> | SVE      | <u>C-19</u>       |
|----|-------------|------------------------------------------------------------------------------------------------|----------|-------------|----------|-------------------|
|    |             |                                                                                                |          |             |          |                   |
|    |             | SKEE VIDYHNIKETHAN ENGINEERING CO                                                              |          |             |          |                   |
|    |             | II B.Tech I Semester (SVEC-19) Supplementary Examina                                           | tions Au | gust – 2    | 2021     |                   |
|    |             | MANUFACTURING TECHNOLOGY                                                                       |          |             |          |                   |
|    | <b>T:</b> ^ | [ Mechanical Engineering ]                                                                     |          | λ.Г         | M        | <u>(</u> )        |
|    | 1 ime: 3    | Answer One Ouestion from each Unit                                                             |          | Max         | . Marks: | UU                |
|    |             | All questions carry equal marks                                                                |          |             |          |                   |
|    |             | UNIT-I )                                                                                       |          |             |          |                   |
| 1. | a)          | Define foundry and explain the types of pattern allowances with a neat diagram.                | 6 Marks  | s L2        | CO1      | PO1               |
|    | b)          | Outline the sand mold making procedure with neat sketch.                                       | 6 Marks  | s L2        | CO1      | PO1<br>PO7        |
| ~  | `           | (OR)                                                                                           |          |             | 001      | DO 1              |
| 2. | a)          | Discuss the types of molding machines used in sand mold process with neat sketches.            | 6 Marks  | s L2        | COI      | PO1               |
|    | b)          | Illustrate the working of cupola furnace with a neat sketch.                                   | 6 Marks  | s L2        | COI      | PO1<br>PO7        |
| -  |             | (UNIT-II)                                                                                      | ·        | _           |          | _                 |
| 3. | a)          | Write short note on continuous casting process.                                                | 6 Marks  | s L2        | CO2      | PO1<br>PO7        |
|    | b)          | List out various casting defects with neat sketches.<br>(OR)                                   | 6 Marks  | s L2        | CO2      | PO1               |
| 4. | a)          | Describe the carbon dioxide molding process in detail.                                         | 6 Marks  | s L2        | CO2      | PO1               |
|    | b)          | Write short notes on inspection and testing of castings.                                       | 6 Marks  | s L2        | CO2      | PO1<br>PO2        |
|    |             | UNIT-III)                                                                                      |          |             |          |                   |
| 5. | a)          | Define extrusion and describe the types of extrusion process with neat sketches.               | 6 Marks  | s L2        | CO3      | PO1<br>PO7        |
|    | b)          | Differentiate hot and cold working process. (OR)                                               | 6 Marks  | s L2        | CO3      | PO1               |
| 6. | a)          | Briefly explain on combination die used in sheet metal operations.                             | 6 Marks  | s L2        | CO3      | PO1               |
|    | b)          | Summarize the electro-hydraulic forming process with a neat sketch.                            | 6 Marks  | s L2        | CO3      | PO1<br>PO7        |
|    |             | UNIT-IV                                                                                        |          |             |          |                   |
| 7. | a)          | Explain the working principle of electron beam welding with its advantages and limitations.    | 6 Marks  | s L2        | CO4      | PO1<br>PO7        |
|    | b)          | List the non-destructive tests used in welding.<br>(OR)                                        | 6 Marks  | s L1        | CO4      | PO1               |
| 8. | a)          | Explain the various types of flames in gas welding process with neat sketches                  | 6 Marks  | s L2        | CO4      | PO1<br>PO2<br>PO7 |
|    | b)          | Describe the soldering process with neat sketches.                                             | 6 Marks  | s L2        | CO4      | PO1<br>PO7        |
|    |             | (UNIT-V)                                                                                       |          |             |          | - 07              |
| 9. | a)          | Describe the working principle of transfer molding process.                                    | 6 Marks  | s L2        | CO5      | PO1<br>PO7        |
|    | b)          | Differentiate thermoplastics and thermosetting Plastics. (OR)                                  | 6 Marks  | s L2        | CO5      | PO1               |
| 10 | a)          | Explain the working principle of calendaring process.                                          | 6 Marks  | s L2        | CO5      | PO1<br>PO7        |
| •  | b)          | Recall the properties and various types of plastics. $\circledast \ \circledast \ \circledast$ | 6 Marks  | s L2        | CO5      | PO1               |

SVEC-19
Roll No.

PO1

PO4

L2

L3

CO<sub>2</sub>

CO<sub>2</sub>

#### **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               | 8 Marks        | L3 | CO2 | PO2 |
|               |    | 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 $E = 2 \times 10^5 \text{ N/mm}^2$ . |                |    |     |     |
|               |    | (OR)                                                                       |                |    |     |     |
| 2.            |    | A rigid block of mass M is supported by three symmetrically                | 12 Marks       | L3 | CO2 | PO2 |
|               |    | spaced rods as shown in Fig 1. Each copper rod has an area of              |                |    |     |     |
|               |    | 900 mm <sup>2</sup> : length of 160 mm; $E = 120$ GPa; and the allowable   |                |    |     |     |

900 mm<sup>2</sup>; length of 160 mm; E = 120 GPa; and the allowable stress is 70 MPa. The steel rod has an area of 1200 mm<sup>2</sup>; length of 240 mm; E = 200 GPa; and the allowable stress is 140 MPa. Determine the largest mass M which can be supported.



3.

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





4. a) Is the point of contra flexure and point of inflexion same? Justify. 4 Marks
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.

|    |          | 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        |
| C  |          | (OR)                                                                                                                                                                                                                                                                                                                                                                                                                        | 10 Montra          | Т 1      | CO1        | DOJ        |
| 0. |          | derive the bending equation from first principles.                                                                                                                                                                                                                                                                                                                                                                          | 12 Marks           | LI       | COI        | PO2        |
| _  |          | (UNIT-IV)                                                                                                                                                                                                                                                                                                                                                                                                                   |                    |          | 0.04       | DOI        |
| 7. | a)<br>b) | State the assumptions involved in deriving the torsion equation.<br>A solid shaft transmits 250 kW at 100 r.p.m. If the shear stress is<br>not to exceed 75 MPa, what should be the diameter of the shaft?<br>If this shaft is replaced by a hollow one, whose inside diameter is<br>0.6 times outside diameter. Determine the size and percentage<br>saving in weight, the maximum shearing stress being the same.<br>(OR) | 4 Marks<br>8 Marks | L1<br>L3 | CO1<br>CO4 | PO1<br>PO2 |
| 8. | a)<br>b) | Explain in brief about principal planes and principal stresses.<br>The principal stresses at a point in a bar are 50 MPa tensile and<br>30 MPa compressive. Calculate the normal stress, shear stress<br>and the resultant stress on a plane inclined at 500 to the axis of<br>the major principal stress. Also find the maximum shear stress at<br>the point.                                                              | 4 Marks<br>8 Marks | L2<br>L3 | CO4<br>CO5 | PO1<br>PO2 |
| 9. |          | A cantilever of 3m length and of uniform rectangular cross-<br>section 150mm wide and 300mm deep is loaded with a 30 kN<br>load at its free end. In addition to this, it carries a uniformly<br>distributed load of 20 kN/m run over its entire length. Calculate:<br>i) maximum slope and maximum deflection.<br>ii) slope and deflection at 2 m from fixed end.<br>Take $E = 210 \text{ GN/m}^2$ .                        | 12 Marks           | L4       | CO6        | PO4        |
| 10 |          | (OR)<br>Derive the relations for slope and deflection of a simply<br>supported beam of span 'L' subjected to the following loads.<br>i) When a concentrated load 'W' acts at mid of span?<br>ii) When a UDL of intensity w per unit run act over entire                                                                                                                                                                     | 12 Marks           | L2       | CO6        | PO3        |

span?

\$P \$P \$P

|    | CODE    | No.: 19BT30401                                                                                                                                                                                                                    | ·                   |          | SVE      | <u>C-19</u> |
|----|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------|----------|-------------|
|    |         | Roll No.                                                                                                                                                                                                                          |                     |          |          |             |
|    |         | SREE VIDYANIKETHAN ENGINEERING COU<br>(An Autonomous Institution, Affiliated to JNTUA, Ananthapura                                                                                                                                | <b>LEGE</b><br>amu) |          |          |             |
|    |         | II B.Tech I Semester (SVEC-19) Supplementary Examinat                                                                                                                                                                             | tions Au            | gust – 2 | 2021     |             |
|    |         | ELECTROMAGNETIC FIELDS AND TRANSMISS                                                                                                                                                                                              | ON LIN<br>g]        | ES       |          |             |
| ,  | Time: 3 | hours                                                                                                                                                                                                                             |                     | Max      | . Marks: | 60          |
|    |         | Answer One Question from each Unit<br>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             | s L1     | CO1      | PO1         |
|    | b)      | Differentiate Convection and Conduction Currents.<br>(OR)                                                                                                                                                                         | 6 Marks             | s L2     | CO1      | PO2         |
| 2. | a)      | State Ampere's Law. Estimate the magnetic field intensity for an infinite sheet of current density K A/m.                                                                                                                         | 6 Marks             | s L1     | CO1      | PO1         |
|    | b)      | Show that $W_E = \frac{1}{2} \int \varepsilon  0 E^2 dv$ .                                                                                                                                                                        | 6 Marks             | s L1     | CO1      | PO1         |
|    |         |                                                                                                                                                                                                                                   |                     |          |          |             |
| 3. | a)      | Explain Faraday's Law for Time Varying Fields.                                                                                                                                                                                    | 6 Marks             | s L2     | CO2      | PO1         |
|    | b)      | Develop the Maxwell's two equations for magnetostatic fields in point and integral forms.                                                                                                                                         | 6 Marks             | s L2     | CO2      | PO2         |
| 4. | a)      | (OR)<br>Derive the electrostatic Boundary Conditions for:<br>i. i) Dielectric – Dielectric Boundary.<br>ii. ii) Conductor – Dielectric Boundary.<br>iii) Conductor – Free Space Boundary.                                         | 6 Marks             | 5 L4     | CO2      | PO2         |
|    | b)      | Apply Lenz's Law for Magnetic Fields.                                                                                                                                                                                             | 6 Marks             | 5 L3     | CO2      | PO2         |
|    |         | (UNIT-III)                                                                                                                                                                                                                        |                     |          |          |             |
| 5. | a)      | A uniform plane wave propagating in a medium has<br>$E = 2e^{-\alpha z} \sin (10^8 t - \beta z) a_y V/m$ . If the medium is characterized by<br>$a_y = 1 + z = 20$ and $\sigma = 3 \text{ mbas}/m$ . Interpret $\alpha = 0$ and H | 6 Marks             | 5 L3     | CO3      | PO1         |
|    | b)      | $\epsilon_r$ - 1, $\mu_r$ - 20, and 0 - 5 millos/m, interpret 0, p, and 11.<br>Illustrate different types of polarizations with the necessary expressions.                                                                        | 6 Marks             | s L2     | CO3      | PO1         |
| (  | ``      |                                                                                                                                                                                                                                   |                     | 1.0      | 002      | DOI         |
| 6. | a)      | Develop the Wave Equations for Dielectric and Conducting Medium.                                                                                                                                                                  | 6 Marks             | 5 L2     | CO3      | PO3         |
|    | b)      | Illustrate the reflection by a perfect conductor at normal incidence for parallel polarization. Formulate the expressions for fields.                                                                                             | 6 Marks             | s L4     | CO3      | PO2         |
| 7  | a)      | Derive the basic Transmission Line Equations and derive the                                                                                                                                                                       | 6 Marks             | 5 L2     | CO4      | PO2         |
| ,. | b)      | secondary constants of transmission lines using them.<br>A lossless transmission line of length 100m has an inductance of                                                                                                         | 6 Marks             | s L3     | CO4      | PO4         |
|    | - )     | <ul> <li>28 μ H and capacitance of 20 nF. Find out:</li> <li>i) Propagation velocity.</li> <li>ii) Phase constant at an operating frequency of 100 KHz.</li> <li>iii) Characteristic impedance of the line.</li> </ul>            |                     |          |          | 1           |

|    |    | (OR)                                                                           |         |    |     |     |
|----|----|--------------------------------------------------------------------------------|---------|----|-----|-----|
| 8. | a) | Derive the Phase and Group Velocities.                                         | 6 Marks | L2 | CO4 | PO2 |
|    | b) | Develop the condition for distortion less and Minimum                          | 6 Marks | L2 | CO4 | PO3 |
|    |    | Attenuation.                                                                   |         |    |     |     |
|    |    | UNIT-V                                                                         |         |    |     |     |
| 9. | a) | Derive the expression for the input impedance of a transmission                | 6 Marks | L2 | CO4 | PO2 |
|    |    | line of length L.                                                              |         |    |     |     |
|    | b) | A transmission line operating at 500MHz has $Zo=80\Omega$ ,                    | 6 Marks | L3 | CO4 | PO4 |
|    |    | $\alpha$ =0.04 Np/m, $\beta$ =1.5 rad/m. Find the line parameters R, L, G, and |         |    |     |     |
|    |    | C.                                                                             |         |    |     |     |
|    |    | (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              | 6 Marks | L1 | CO4 | PO1 |
|    |    | plot VSWR using smith chart.                                                   |         |    |     |     |

\$\$ \$\$ \$\$

1.

2.

L2

L4

CO<sub>2</sub>

CO2

PO1

PO4

## 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<br>All questions carry equal marks                                                                                                                                                                                                                                                                                                  |          |                |     |     |  |
|               | UNIT-I                                                                                                                                                                                                                                                                                                                                                                 |          |                |     |     |  |
|               | Discuss briefly about series clipper circuits and explain their operation with the help of transfer characteristics.                                                                                                                                                                                                                                                   | 12 Marks | L2             | CO1 | PO1 |  |
|               | (OR)                                                                                                                                                                                                                                                                                                                                                                   |          |                |     |     |  |
| a)            | A square wave whose peak to peak amplitude is 4 V extends $\pm 2$ 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<br>with different time constants and derive the expression for rise<br>time.                                                                                                                                                                                                                           | 6 Marks  | L2             | CO1 | PO2 |  |

# UNIT-II

3. a) Determine V<sub>CE</sub> and I<sub>C</sub> in the voltage divider biased transistor 6 Marks L3 CO2 PO4 circuit given in the following figure. Assume V<sub>CC</sub>=20V,  $R_1=6.8k\Omega$ ,  $R_2=R_C=R_E=1k\Omega$ ,  $\beta_{DC}=60$ . Assume V<sub>BE</sub>=0.7V.



b) Design a self-bias circuit and derive the expression for stability 6 Marks L4 CO2 PO3 factor.

(OR)

4. a) Differentiate bias stabilization and compensation techniques 6 Marks
b) Determine the change in collector current produced in the following circuits. The circuit temperature raised from 25°C to 105°C and I<sub>CBO</sub>=15nA@25°C.



|    |    | 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-<br>bias method for FET                                                                                                                                                       | 6 Marks  | L2 | CO4 | PO1 |
|    | b) | Define the parameters trans-conductance $g_m$ , Drain resistance $r_d$ and amplification factor $\mu$ 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 10K $\Omega$ and $C_E$ is 0.1 $\mu$ F and Intrinsic stand-off ratio is 0.65.                                                                                            | 4 Marks  | L2 | CO5 | PO1 |
| 10 | a) | Draw the internal diagram of an SCR (specifying the different<br>layers and their doping levels) and hence, explain the various<br>operating modes of the device. Also draw the V-I characteristics<br>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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|              | CODE    | No.: 19BT30403                                                                                                    |               |            | SVE      | C-19 |
|--------------|---------|-------------------------------------------------------------------------------------------------------------------|---------------|------------|----------|------|
|              |         | Roll No.                                                                                                          |               |            |          |      |
|              |         | SREE VIDYANIKETHAN ENGINEERING COU                                                                                | LEGE          |            |          |      |
|              |         | (An Autonomous Institution, Affiliated to JNTUA, Ananthapur                                                       | amu)          |            |          |      |
|              |         | II B.Tech I Semester (SVEC-19) Supplementary Examina                                                              | tions Augu    | st-2       | 021      |      |
|              |         | SIGNALS AND SYSTEMS                                                                                               | _             |            |          |      |
|              |         | [ Electronics and Communication Engineering                                                                       | ng j          |            |          |      |
| ,            | Time: 3 | hours                                                                                                             |               | Max.       | Marks: ( | 50   |
|              |         | Answer One Question from each Unit                                                                                |               |            |          |      |
|              |         | All questions carry equal marks                                                                                   |               |            |          |      |
|              |         |                                                                                                                   |               |            |          |      |
| 1            | a)      | Discuss the importance of impulse signal with relevant                                                            | 2 Marks       | L1         | CO1      | PO1  |
| 1.           | u)      | mathematical expressions.                                                                                         | 2 10101115    | LI         | 001      | 101  |
|              | b)      | Explain the following properties of systems with examples.                                                        | 10 Marks      | L1         | CO1      | PO1  |
|              | ,       | i) Stability. ii) Linearity.                                                                                      |               |            |          |      |
|              |         | iii) Causality. iv) Time-invariance.                                                                              |               |            |          |      |
|              |         | (OR)                                                                                                              |               |            |          |      |
| 2.           | a)      | Sketch $y(t) = r(t)+r(t-1) + r(t-2) + r(t-3)$ where $r(t)$ is unit ramp                                           | 8 Marks       | L2         | CO1      | PO2  |
|              | 1 \     | function.                                                                                                         |               | т 1        | 001      | DO 1 |
|              | b)      | Define the following Elementary signals.                                                                          | 4 Marks       | LI         | COI      | POI  |
|              |         | 1) Real Exponential Signal.                                                                                       |               |            |          |      |
|              |         |                                                                                                                   |               |            |          |      |
| r            | 2)      | Examine the conditions required for evistence of fourier                                                          | 2 Martra      | Т 1        | CON      |      |
| 3.           | a)      | transform                                                                                                         | 3 Marks       | LI         | 002      | POI  |
|              | b)      | Apply exponential Fourier series and plot the magnitude and                                                       | 9 Marks       | L3         | CO2      | PO5  |
|              | 0)      | phase spectrum for the triangular waveform shown in figure.                                                       | , 1,1,1,1,1,5 | 20         | 001      | 100  |
|              |         | f(t)                                                                                                              |               |            |          |      |
|              |         | $\times / ( / ( / ( / ( / ( / ( / ( / ( / ( / $                                                                   |               |            |          |      |
|              |         | time $\longrightarrow$ $\downarrow$ $\downarrow$ $\downarrow$ $\downarrow$ $\downarrow$ $\downarrow$ $\downarrow$ |               |            |          |      |
|              |         |                                                                                                                   |               |            |          |      |
| 1            | a)      | (UR)                                                                                                              | 1 Marka       | 12         | $CO^{2}$ | DOJ  |
| 4.           | a)      | i) Modulation theorem of Fourier transform                                                                        | 4 IVIAIKS     | LΔ         | 002      | FO2  |
|              |         | i) Duality property of Fourier transform                                                                          |               |            |          |      |
|              | b)      | Obtain the Fourier transform of the following functions:                                                          | 8 Marks       | L2         | CO2      | PO4  |
|              | ,       | i) Impulse train. ii) DC Signal.                                                                                  |               |            |          |      |
|              |         | iii) Decaying exponential.                                                                                        |               |            |          |      |
|              |         | UNIT-III                                                                                                          |               |            |          |      |
| 5.           | a)      | Explain the process of detection of periodic signals in the                                                       | 6 Marks       | L4         | CO3      | PO6  |
|              |         | presence of noise with a specific example.                                                                        |               |            |          |      |
|              | b)      | Prove that for a signal, auto correlation and PSD form a fourier                                                  | 6 Marks       | L2         | CO3      | PO2  |
|              |         | transform pair.                                                                                                   |               |            |          |      |
| $\mathbf{c}$ | -)      | (OR)                                                                                                              | 0 Maulaa      | 10         | CON      |      |
| 6.           | a)      | Find the cross correlation between unit triangular and unit gate                                                  | 8 Marks       | L2         | 003      | PO4  |
|              |         | pulse as follows. $\mathbf{A}$ $\mathbf{A}$ $\mathbf{V}$ (t)                                                      |               |            |          |      |
|              |         | $1 \mathbf{x}(t)$                                                                                                 |               |            |          |      |
|              |         |                                                                                                                   |               |            |          |      |
|              |         |                                                                                                                   |               |            |          |      |
|              |         |                                                                                                                   |               | <b>.</b> . | <u> </u> | DC:  |
|              | b)      | State the properties of auto correlation function.                                                                | 4 Marks       | L1         | CO3      | PO1  |
|              |         |                                                                                                                   |               |            |          |      |

|    |          | (UNIT-IV)                                                                                                                                                                                               |                    |          |            |            |
|----|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------|------------|------------|
| 7. | a)<br>b) | Find Laplace Transform of the signal $\overline{X(t)}=e^{-b t }$<br>The input and output of a causal LTI system are related by the differential equation: $d^2 v(t)/dt^2 + 6dv(t)/dt + 8v(t) = 2v(t)$   | 3 Marks<br>9 Marks | L1<br>L4 | CO4<br>CO4 | PO1<br>PO4 |
|    |          | i) Find the impulse response of the system.<br>ii) What is the response of this system if $\mathbf{x}(t) = t e^{-2t} \mathbf{u}(t)$ .                                                                   |                    |          |            |            |
| 8. | a)       | Obtain the inverse transform of $F(s) = x = \frac{1}{s(s-3)(s+10)}$ using                                                                                                                               | 6 Marks            | L3       | CO4        | PO5        |
|    | b)       | partial fraction method.<br>Bring out the relationship between Fourier transform and Laplace transform?                                                                                                 | 6 Marks            | L2       | CO4        | PO2        |
|    |          | UNIT-V                                                                                                                                                                                                  |                    |          |            |            |
| 9. | a)       | For the anlog signal $x(t)=3\cos 100\pi t$ which is to be transmitted into free space.                                                                                                                  | 8 Marks            | L4       | CO5        | PO4        |
|    |          | <ul> <li>i) determine minimum sampling rate to avoid alaising.</li> <li>ii) suppose that the signal is sampled at a rate fs=200Hz, what is the discrete time signal obtained after sampling.</li> </ul> |                    |          |            |            |
|    |          | iii) suppose the signal is sampled at a rate fs=75hz,<br>what is the discrete time signal obtained<br>after smapling                                                                                    |                    |          |            |            |
|    |          | iv) what is the frequency 0 <f<fs 2="" a="" of="" sinusoid="" that<br="">yeilds samples identical to those obtained in (iii)<br/>above</f<fs>                                                           |                    |          |            |            |
|    |          | compare them with the standard transmission values in frequency band.                                                                                                                                   |                    |          |            |            |
|    | 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.<br>i) Natural sampling.<br>ii) Elat top sampling                                                                                                             | 4 Marks            | L1       | CO5        | PO1        |
|    | b)       | Discuss the process of reconstruction of a signal from its samples<br>using interpolation with relevant mathematical expressions.                                                                       | 8 Marks            | L2       | CO5        | PO2        |

| (  | CODE         | No.: 19BT30404                                                                                                              |                    |          | SVE        | <u>C-19</u> |
|----|--------------|-----------------------------------------------------------------------------------------------------------------------------|--------------------|----------|------------|-------------|
|    |              |                                                                                                                             |                    |          |            |             |
|    |              |                                                                                                                             |                    |          |            |             |
|    |              | II B Tech I Semester (SVEC-19) Sunnlementary Examinat                                                                       | amu)<br>tions Augu | ist _ 2  | 021        |             |
|    |              | SWITCHING THEORY AND LOGIC DESI                                                                                             | GN                 |          | 021        |             |
|    | [ El         | ectronics and Communication Engineering, Electronics and Inst                                                               | rumentatio         | n Engi   | neering    | ;]          |
| ,  | •<br>Fimor 2 | e e e                                                                                                                       |                    | Mar      | Maultar    | <u> </u>    |
|    | i inte: 3    | Answer One Ouestion from each Unit                                                                                          |                    | wax.     | warks:     | 00          |
|    |              | All questions carry equal marks                                                                                             |                    |          |            |             |
|    |              | UNIT-I                                                                                                                      |                    |          |            |             |
| 1. | a)           | Perform the following decimal subtractions in BCD by the 9's complement method.                                             | 8 Marks            | L2       | CO1        | PO1         |
|    | b)           | Express -42.62 in 12-bit 2's complement form.<br>(OR)                                                                       | 4 Marks            | L2       | CO1        | PO1         |
| 2. |              |                                                                                                                             | 6 Marks            | L2       | CO1        | PO1         |
|    | a)           | Reduce the expression $F + \left[ AB + \overline{BC} \right]^{(\overline{B} + AC)}$ .                                       |                    |          |            |             |
|    | b)           | Realize the X-NOR function using.<br>i) NAND logic.                                                                         | 6 Marks            | L2       | CO1        | POI         |
|    |              | ii) NOR logic.                                                                                                              |                    |          |            |             |
|    |              | (UNIT-II)                                                                                                                   |                    |          |            |             |
| 3. | a)           | Deduce the expression in universal logic for the expression $F = \pi M(1,3,4,9,10,11,13)$ .                                 | 6 Marks            | L4       | CO1        | PO2         |
|    | b)           | Implement F= $\Sigma$ m (1,3,4,9,10,11,14) using 8 x 1 mux.<br>(OR)                                                         | 6 Marks            | L4       | CO1        | PO2         |
| 4. | a)           | Realize a full-adder using.<br>i) only NAND gates.                                                                          | 6 Marks            | L3       | CO1        | PO2         |
|    | b)           | ii) only NOR gates.<br>Simplify the following function using Tabular method.                                                | 6 Marks            | L4       | CO1        | PO2         |
|    |              | F (A, B, C, D) = $\Sigma m(0, 1, 2, 3, 4, 10, 11, 12)$ .                                                                    |                    |          |            |             |
| _  |              | (UNIT-III)                                                                                                                  |                    |          | ~~~        |             |
| 5. | a)           | Realize the function "F" using MUX.<br>$F(P \cap R S) = (0.1.3.4.8.9.15)$                                                   | 6 Marks            | L4       | CO2        | PO4         |
|    | b)           | Draw the BCD to seven segment display decoders                                                                              | 6 Marks            | L1       | CO2        | PO1         |
| 6. | a)           | Design a 16-line to 1-line multiplexer using 4-line to 1-line<br>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         |
| 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)<br>b)     | Show how ring counter will act as a Johnson counter.<br>Convert a J-K flip-flop in to<br>i) SR flip-flop<br>ii) T flip flop | 6 Marks<br>6 Marks | L2<br>L2 | CO2<br>CO2 | PO7<br>PO2  |
|    |              | iii) D flip-flop                                                                                                            |                    |          |            |             |

|    |     | UNIT-V                                                            |         |     |     |     |
|----|-----|-------------------------------------------------------------------|---------|-----|-----|-----|
| 9. | a)  | Design a combinational circuit using a PROM. The circuit          | 6 Marks | L4  | CO3 | PO7 |
|    |     | accepts a 3-bit binary number and generates its equivalent XS-3   |         |     |     |     |
|    | 1 \ |                                                                   |         | 1.2 | 002 | DOO |
|    | D)  | Obtain capabilities and limitations of finite state machines with | 6 Marks | L2  | 003 | PO2 |
|    |     | aid of neat sketches.                                             |         |     |     |     |
|    |     | (OR)                                                              |         |     |     |     |
| 10 | a)  | Use PLA to Implement the following two Boolean functions.         | 6 Marks | L3  | CO4 | PO2 |
|    |     | $F_1(A,B,C) = \sum m(1,2,4)$                                      |         |     |     |     |
|    |     | $F_2(A,B,C) = \sum m(3,4,6,7)$                                    |         |     |     |     |
|    | b)  | Apply 2-bit binary input to PROM and generate square of the       | 6 Marks | L2  | CO3 | PO4 |
|    |     | binary input.                                                     |         |     |     |     |

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|    | CODE     | No.: 19BT30501                                                                                                              |                               |         | SVE      | C-19         |
|----|----------|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------|----------|--------------|
|    |          | Roll No.                                                                                                                    |                               |         |          |              |
|    |          | SREE VIDYANIKETHAN ENGINEERING COU                                                                                          | LLEGE                         |         |          |              |
|    |          | (An Autonomous Institution, Affiliated to JNTUA, Ananthapur<br>II B.Tech I Semester (SVEC-19) Supplementary Examina         | <sup>amu)</sup><br>tions Augu | ıst — 2 | 021      |              |
|    |          | COMPUTER GRAPHICS                                                                                                           |                               |         |          |              |
|    |          | [ Computer Science and Engineering, Information T                                                                           | echnology ]                   |         |          |              |
|    | Time: 3  | t hours                                                                                                                     |                               | Mov     | Marker ( | <0           |
|    | 1 11110. | Answer One Ouestion from each Unit                                                                                          |                               |         |          | 50           |
|    |          | All questions carry equal marks                                                                                             |                               |         |          |              |
|    |          | UNIT-I                                                                                                                      |                               |         |          |              |
| 1. | a)       | Design a circle radius $r = 10$ , demonstrate the mid point circle                                                          | 6 Marks                       | L2      | CO2      | PO3          |
|    | ,        | algorithm by determining positions along the circle octant in the first quadrant $x = 0$ to $x = y$ .                       |                               |         |          |              |
|    | b)       | Compute the intermediate points using the DDA algorithm when                                                                | 6 Marks                       | L3      | CO2      | PO2          |
|    |          | the endpoints of the line is given as $(5,4)$ and $(12,7)$ .                                                                |                               |         |          |              |
| r  | a)       | (OR)<br>Distinguish batwaan Bastar saan systems and Bandom saan                                                             | 6 Mortes                      | 12      | CO1      | DOJ          |
| ۷. | a)       | systems                                                                                                                     | o marks                       | L2      | COI      | PO2          |
|    | b)       | List the operations of following devices.                                                                                   | 6 Marks                       | L1      | CO1      | PO1          |
|    |          | i) CRT. ii) Graphics Monitors and Workstations.                                                                             |                               |         |          |              |
|    |          | UNIT-II                                                                                                                     |                               |         |          |              |
| 3. | a)       | Write pseudo code for filling color in an object using Boundary                                                             | 6 Marks                       | L1      | CO2      | PO1          |
|    | • `      | Fill algorithm to fill an 8-connected region.                                                                               |                               |         |          | <b>D O A</b> |
|    | b)       | Define scaling in 3-D Composite Transformations and Rotation<br>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                                                            | 8 Marks                       | L1      | CO3      | PO1          |
|    | ,        | graphics for the operations Translation and Rotation.                                                                       |                               |         |          |              |
|    |          |                                                                                                                             |                               |         |          |              |
|    | b)       | A triangle defined by vertices $A(0,2)$ , $B(0,3)$ and $C(1,2)$ perform                                                     | 4 Marks                       | L3      | CO3      | PO2          |
|    |          | the following transformations and plot the final positions of the                                                           |                               |         |          |              |
|    |          | 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.                                                                    |                               |         |          |              |
|    |          | (UNIT-III)                                                                                                                  |                               |         |          |              |
| 5. | a)       | Illustrate Sutherland-Hodgeman polygon clipping algorithm with                                                              | 6 Marks                       | L2      | CO3      | PO2          |
|    | 1 \      | suitable example.                                                                                                           | $(M_{1})$                     | т 1     | 002      |              |
|    | D)       | Explain Two-Dimensional viewing transformation pipeline.                                                                    | 6 Marks                       | LI      | 003      | POI          |
| 6. | a)       | Write an algorithm to display three dimensional. Hermite curve.                                                             | 6 Marks                       | L1      | CO3      | PO1          |
| 0. | ••)      | given a set of four control points in the XY plane.                                                                         | 0 11 11 110                   | 21      | 000      | 101          |
|    | 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                                                            | 6 Marks                       | L2      | CO3      | PO2          |
|    |          | graphics for the operations Scaling and Rotation.                                                                           |                               |         |          |              |
|    | b)       | Compare and contrast the properties of Parallel and Perspective                                                             | 6 Marka                       | 12      | CO4      | PO7          |
|    | U)       | compare and contrast the properties of raranet and respective                                                               | U IVIAINS                     |         | 004      | 102          |

Projections.

(**OR**)

|    |    | (OK)                                                                                                                                                                                                                                        |         |    |     |     |
|----|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----|-----|-----|
| 8. | a) | A triangle is located at $P(10,40)$ , $Q(40,40)$ , $R(40,30)$ . Work out<br>the transformation matrix which would rotate the triangle by<br>90 degree counterclockwise about the point Q. Find the co-<br>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.<br>i) Back-face detection.                                                                                                                                                                    | 6 Marks | L1 | CO4 | PO1 |
|    |    | ii) Depth-buffer method.                                                                                                                                                                                                                    |         |    |     |     |
|    | 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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|    | CODE    | No.: 19BT30502                                                     |            |            | SVE      | <u>C-19</u> |
|----|---------|--------------------------------------------------------------------|------------|------------|----------|-------------|
|    |         | Roll No.                                                           |            |            |          |             |
|    |         | SREE VIDYANIKETHAN ENGINEERING COU                                 | LEGE       |            |          |             |
|    |         | (An Autonomous Institution, Affiliated to JNTUA, Ananthapura       | amu)       |            |          |             |
|    |         | II B.Tech I Semester (SVEC-19) Supplementary Examinat              | tions Augu | st – 2     | 021      |             |
|    |         | COMPUTER ORGANIZATION                                              |            |            |          |             |
|    |         | [ Computer Science and Engineering, Information Te                 | echnology, |            |          |             |
|    |         | <b>Computer Science and Systems Engineering</b>                    | g ]        |            |          |             |
|    | Time: 3 | hours                                                              |            | Max.       | Marks: ( | 50          |
|    |         | Answer One Question from each Unit                                 |            |            |          |             |
|    |         | All questions carry equal marks                                    |            |            |          |             |
|    |         |                                                                    |            |            |          |             |
| 1  | 2)      | Show the contents of mariaters E. A. O and SC during the macage    | ( Marles   | т 2        | COL      | DOJ         |
| 1. | a)      | show the contents of registers E, A, Q and SC during the process   | o Marks    | L3         | COI      | PO2         |
|    |         | 10101(multiplicand) and 11111(multiplicar). The signs are not      |            |            |          |             |
|    |         | included                                                           |            |            |          |             |
|    | b)      | Discuss in detail the floating-point representation of hipary      | 6 Marks    | 12         | CO1      | PO1         |
|    | 0)      | numbers                                                            | 0 WIAIKS   |            | COI      | 101         |
|    |         | (OR)                                                               |            |            |          |             |
| 2  | a)      | Perform the following arithmetic operations in binary using sign-  | 6Marks     | L3         | CO1      | PO2         |
|    | 4)      | magnitude representation.                                          | onumb      | 10         | 001      | 102         |
|    |         | i) $(+12)_{10} + (-13)_{10}$ ii) $(-12)_{10} + (-13)_{10}$         |            |            |          |             |
|    |         | iii) $(-6)_{10} - (+13)_{10}$                                      |            |            |          |             |
|    | b)      | Design a 2 x 2 array multiplier. Draw the logic diagram and        | 6 Marks    | L4         | CO3      | PO3         |
|    |         | explain.                                                           |            |            |          |             |
|    |         | UNIT-II )                                                          |            |            |          |             |
| 3. | a)      | Suppose a machine encodes instructions in 32 bits according to     | 6 Marks    | L3         | CO2      | PO2         |
|    | ,       | the following format. The instruction contains 1 Opcode field,     |            |            |          |             |
|    |         | 2 register address fields and 1 immediate data field.              |            |            |          |             |
|    |         | Oncode Reg1 Reg2 Imm                                               |            |            |          |             |
|    |         | Also suppose the encoding must accommodate 164 on order            |            |            |          |             |
|    |         | and 50 registers. Determine what will be number of bits required   |            |            |          |             |
|    |         | for each of the fields                                             |            |            |          |             |
|    | b)      | What are the differences between a direct and indirect address     | 6 Marks    | L2         | $CO^2$   | PO1         |
|    | 0)      | instruction? How many references to memory are needed for          | 0 IVIUIKS  |            | 002      | 101         |
|    |         | each type of instruction to bring an operand into a processor      |            |            |          |             |
|    |         | register? Explain.                                                 |            |            |          |             |
|    |         | (OR)                                                               |            |            |          |             |
| 4. | a)      | What are register-reference instructions? List any two examples    | 6 Marks    | L2         | CO2      | PO1         |
|    | ,       | and explain.                                                       |            |            |          |             |
|    | b)      | Compare the three types of displacement addressing modes -         | 6 Marks    | L2         | CO2      | PO2         |
|    |         | Relative, Base-Register, and Indexed.                              |            |            |          |             |
|    |         | (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 | 6 Marks    | L3         | CO4      | PO1         |
|    |         | that supports the use of PCI express (PCIe).                       |            |            |          |             |
|    |         | (OR)                                                               |            |            |          |             |
| 6. | a)      | Compare cycle-stealing mode and burst mode of DMA technique        | 6 Marks    | L3         | CO4      | PO2         |
|    |         | for data transfer.                                                 |            | <b>.</b> . | <u> </u> | <b>D</b> -  |
|    | b)      | How multiple simultaneous interrupt requests are handled by the    | 6 Marks    | L3         | CO3      | PO3         |
|    |         | processor. Design an example combinational circuit and explain.    |            |            |          |             |
|    |         |                                                                    |            |            |          |             |

|    |    | 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.<br>(OR)                                                      | 6 Marks | L3 | CO2 | PO1 |
| 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<br>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<br>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 |

**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

#### **DATA STRUCTURES**

#### [Computer Science and Engineering, Information Technology]

Time: 3 hours

1.

2.

3.

a)

b)

a)

b)

a)

b)

Max. Marks: 60

CO1

CO1

CO1

CO1

CO4

CO1

PO2

PO1

PO1

**PO2** 

PO<sub>2</sub>

PO3

PO3

PO2

### **Answer One Question from each Unit** All questions carry equal marks

#### UNIT-I ) Distinguish between linear and non-linear data structures. 4 Marks L2 Define linked list. With a neat diagram show how an element is L2 8 Marks added and removed from front end of the list. (OR)Define Double linked list. Write the implementations related to 8 Marks L1inserting a node at user specified position and deleting a node at end. Discuss the advantages and disadvantages of linked lists and 4 Marks L2 arrays. UNIT-II ) Evaluate the given postfix expression 623+-382/+\*2\$3+ L4 4 Marks Explain the list implementation queue data structures and write 8 Marks L3 its implementation. (**OR**)

#### Explain the relevance of stack implementation with recursive 4. a) 6 Marks L3 CO1 function evaluation. b) List out the drawbacks of linear queue? How do overcome it. 6 Marks L2 CO1 Explain.

# UNIT-III

| 5. | a) | Explain the three standard ways of traversing a binary tree with a | 6 Marks | L2 | CO2 | PO1 |
|----|----|--------------------------------------------------------------------|---------|----|-----|-----|
|    |    | recursive algorithm.                                               |         |    |     |     |
|    | 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     | 4 Marks | L3 | CO2 | PO3 |
|    |    | sequentially. 45, 32,70,67,21,85,92,40 and explain steps involved  |         |    |     |     |

in detail. b) What are the properties of Height Balanced Trees? With 8 Marks L2 CO2 PO2 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.

# 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 | 7 Marks | L3 | CO3 | PO2 |
|----|----|-----------------------------------------------------------------------------------------------------------------------------|---------|----|-----|-----|
|    |    | explain in detail.                                                                                                          |         |    |     |     |
|    | 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                                                               | 7 Marks | L2 | CO3 | PO2 |
|    |    | sort: 10, 18, 29, 68, 32, 43, 37, 87, 24, 47, 50                                                                            |         |    |     |     |
|    | b) | Explain Java code for linear search with an example.                                                                        | 5 Marks | L2 | CO3 | PO2 |

Explain Java code for linear search with an example. D)

# UNIT-V

- 9. Describe in detail about breadth first traversal of a graph with 6 Marks L2 CO4 PO2 a) suitable example. Construct and discuss about any two collision avoiding L3 CO2 PO3 b) 6 Marks techniques. (OR) Describe in detail about depth first traversal of a graph with 10 a) 6 Marks L1 CO4 PO1 suitable example. . Solve: Given input (371, 323, 173, 199, 344, 679, 989) and hash 6 Marks L4 CO2 PO2 b)
  - 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).

**CODE No.: 19BT31001 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 **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 Find the multiplying power of a shunt of  $200\Omega$  resistance used 6 Marks 1. a) L3 CO<sub>2</sub> PO2 with a galvanometer of  $1000\Omega$  resistance. Determine the values of shunt resistance to give a multiplying power of 50. Compare Moving coil instruments with moving iron instruments. b) 6 Marks L2 CO1 **PO1** (**OR**) 2. The inductance of a moving iron ammeter with a full scale L2 CO3 a) 6 Marks PO1 deflection of 90° at 1.5A, is given by the expression L=(200+40 $\theta$ -4 $\theta$ <sup>2</sup>- $\theta$ <sup>3</sup>) $\mu$ H, where  $\theta$  is the deflection in radian from the zero position. Estimate the angular deflection of the pointer for a current of 1.0A. Rectifier instruments are particularly suited to measurements on L3 **PO1** b) 6 Marks CO1 communication circuits justify. UNIT-II 3. Derive the expression for half scale resistance in Shunt Type 12 Marks L3 CO1 PO1 Ohmmeter. (**OR**) Discuss about measurement of voltage and current using AC 4. L2 CO1 **PO2** a) 6 Marks Crompton potentiometer with relevant sketches. Select and brief an appropriate technique for measurement of 6 Marks L3 CO1 PO5 b) Low resistance range of 2 mOhm. (UNIT-III) 5. Recall compensation technique for overload and frictional errors 7 Marks a) L3 CO1 PO6 occurred in single phase induction type energy meter used in industrial applications. With a neat diagram, explain the principle and working of 5 Marks L2 CO1 PO1 b) TWO -Element Energy meter. (**OR**) Explain the construction and working principle of single-phase 6. 8 Marks L2 CO1 PO1 a) electro dynamo power factor meter. List the errors associated in dynamometer wattmeter. 4 Marks L2 CO1 PO1 b) UNIT-IV Derive the balance equation of De sauty's bridge for 7. 7 Marks L3 CO3 PO2 a) measurement of capacitance. Select suitable bridge for measurement of unknown capacitance 5 Marks L2 CO3 PO5 b) and derive the equations under balance. (**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<br>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                                                                                                                                                                                     |                        |          | SVE      | C-19 |
|----|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------|----------|------|
|    |         | Roll No.                                                                                                                                                                                           |                        |          |          |      |
|    |         | SREE VIDYANIKETHAN ENGINEERING COU<br>(An Autonomous Institution, Affiliated to JNTUA, Ananthapur                                                                                                  | ALEGE<br>amu)          |          |          |      |
|    |         | II B.Tech I Semester (SVEC-19) Supplementary Examina                                                                                                                                               | tions Augu             | ist - 20 | 021      |      |
|    |         | DISCRETE MATHEMATIC STRUCTURE<br>[ Computer Science and Engineering, Information To<br>Computer Science and Systems Engineering                                                                    | ES<br>echnology,<br>g] |          |          |      |
|    | Time: 3 | bours                                                                                                                                                                                              |                        | Max.     | Marks: ( | 50   |
|    |         | Answer One Question from each Unit<br>All questions carry equal marks                                                                                                                              |                        |          |          |      |
|    |         | UNIT-I                                                                                                                                                                                             |                        |          |          |      |
| 1. | a)      | Construct truth table for the following:<br>i) $(P \lor O) \land R$ ii) $(P \lor \neg O) \Rightarrow R$ iii) $(P \downarrow O) \land R$                                                            | 6 Marks                | L6       | CO1      | PO2  |
|    | b)      | Justify the following expression<br>$((P V \neg Q) \land (\neg P V \neg Q)) V Q$ is a tautology or not.<br>(OR)                                                                                    | 6 Marks                | L5       | CO1      | PO2  |
| 2. | a)      | Identify the converse, inverse and contra positive of the following conditional statement.<br><i>"If the flood destroys my house or the fires destroy my house,</i>                                | 6 Marks                | L1       | CO1      | PO2  |
|    | b)      | then my insurance company will pay me".<br>Find negation of the following statement:<br>$\exists x \in \mathbb{R}, x > 3 \Rightarrow x^2 > 9$                                                      | 6 Marks                | L2       | CO1      | PO1  |
|    |         | UNIT-II                                                                                                                                                                                            |                        |          |          |      |
| 3. | a)      | Let <i>f</i> and <i>g</i> be functions from <i>R</i> to <i>R</i> , where <i>R</i> is a set of real numbers defined by $f(x) = x^2 + 3x + 1$ and $g(x) = 2x-3$ . Find the composition of functions: | 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  |
| 4  | a)      | (OR)<br>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  |
| 5. | a)      | Examine whether given set 'S,' $S = \{0,1,2,3,4,5\}$ can be semi-group under binary operation $\Theta$ or not.                                                                                     | 6 Marks                | L5       | CO3      | PO2  |
|    | b)      | Explain about semi-group Homomorphism.                                                                                                                                                             | 6 Marks                | L1       | CO3      | PO1  |
| 6. | a)      | Q is the set of rational numbers, $\circ$ is a binary operation defined<br>on Q such that $a \circ b = a - b + ab$ for $a, b \in Q$ . Prove $(Q, \circ)$ is a<br>semigroup or not.                 | 6 Marks                | L5       | CO3      | PO2  |
|    | b)      | Prove that the set Z of all integers with binary operation<br>* defined by a * b = a + b+ 1, $\forall a, b \in Z$ is an abelian group.                                                             | 6 Marks                | L5       | CO3      | PO2  |

| 7. | a)       | Choose a Survey of 500 Television viewers of a sports channel<br>Produced the following information:<br>285 watch Cricket, 195 watch hockey, 115 watch football,<br>45 watch cricket and football, 70 watch cricket and hockey,<br>50 watch hockey and foot ball and 50 do not watch any of the<br>three kinds of games.<br>i) How many viewers in the survey watch all three kinds | 6 Marks            | L1       | CO4        | PO1        |
|----|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------|------------|------------|
|    | b)       | of games?<br>ii) How many viewers watch exactly one of the sports?<br>In how many ways can 6 men and 6 women be seated in a row,<br>i) if any person may sit next to any other.<br>ii) if men and women must occupy alternative seats.                                                                                                                                              | 6 Marks            | L1       | CO4        | PO1        |
| 8. | a)       | (OR)<br>Identify the Coefficient of $X^{27}$ in the expansion of $(X^4+X^5+X^6+)^5$                                                                                                                                                                                                                                                                                                 | 6 Marks            | L1       | CO4        | PO2        |
|    | b)       | If $a_n$ is a solution of the recurrence relation $a_{n+1} = K a_n$ for $n \ge 0$<br>and $a_3 = 153/49$ and $a_5 = 1377/2401$ , find K<br>UNIT-V                                                                                                                                                                                                                                    | 6 Marks            | L3       | CO4        | PO1        |
| 9. | a)<br>b) | Illustrate isomorphism of graphs with an example.<br>Discuss Euler Circuit and Hamilton graph with an example.<br>(OR)                                                                                                                                                                                                                                                              | 6 Marks<br>6 Marks | L1<br>L1 | CO5<br>CO5 | PO2<br>PO1 |
| 10 | a)<br>b) | Demonstrate Depth First Search algorithm with an example.<br>Define MST. Explain Kruskal's algorithm with an example.                                                                                                                                                                                                                                                               | 6 Marks<br>6 Marks | L1<br>L2 | CO5<br>CO5 | PO1<br>PO1 |

|    | CODE      | No.: 19BT31501                                                                                                        |                    |           | <u> </u> | <u>C-19</u> |
|----|-----------|-----------------------------------------------------------------------------------------------------------------------|--------------------|-----------|----------|-------------|
|    |           | Roll No.                                                                                                              |                    |           |          |             |
|    |           | SREE VIDYANIKETHAN ENGINEERING COU                                                                                    | LLEGE              |           |          |             |
|    |           | (An Autonomous Institution, Affiliated to JNTUA, Ananthapur<br>II B. Tech I Semester (SVEC-19) Sunnlementary Evaminat | amu)<br>tions Augu | 1st - ?   | 021      |             |
|    |           | DATA STRUCTURES AND AL CORITHM                                                                                        | ions muge          |           | 021      |             |
|    |           | [ Computer Science and Systems Engineerin                                                                             | g]                 |           |          |             |
|    | Time: 3   | B hours                                                                                                               |                    | Max.      | Marks:   | 60          |
|    |           | Answer One Question from each Unit                                                                                    |                    |           |          |             |
|    |           | All questions carry equal marks                                                                                       |                    |           |          |             |
|    |           | UNIT-I                                                                                                                |                    |           |          |             |
| 1. | a)        | Explain the following terms.                                                                                          | 6 Marks            | L2        | CO1      | PO1         |
|    |           | 1) Big-Oh Notation. 11) Big-Omega Notation.                                                                           |                    |           |          |             |
|    | b)        | Write a program to implement Linear search algorithm and also                                                         | 6 Marks            | Ι.4       | CO2      | PO3         |
|    | 0)        | write the best case, worst case and average case complexities of                                                      | 0 mains            | 21        | 002      | 105         |
|    |           | the algorithm.                                                                                                        |                    |           |          |             |
| 2  | `         | (OR)                                                                                                                  | C M = 1            | 1.2       | 000      | DO 1        |
| 2. | a)<br>b)  | Explain Insertion sort algorithm with an example.                                                                     | 6 Marks<br>6 Marks | L2<br>I 4 | CO2      | PO1<br>PO5  |
|    | 0)        | $\int 2T(n-1) - 1, \text{ if } n > 0$                                                                                 | 0 WIAIKS           | L4        | 002      | 105         |
|    |           | $T(n) = \begin{cases} 1 & \text{otherwise} \\ 1 & \text{otherwise} \end{cases}$                                       |                    |           |          |             |
|    |           |                                                                                                                       |                    |           |          |             |
| 3  | a)        | Explain with a program how to add two polynomials using a                                                             | 6 Marks            | L3        | CO3      | PO3         |
| 2. | u)        | single linked list.                                                                                                   | 0 10141110         | 20        | 005      | 105         |
|    | b)        | What is a circular double linked list and Write an algorithm to                                                       | 6 Marks            | L3        | CO3      | PO3         |
|    |           | sort the elements of a circular double linked list.                                                                   |                    |           |          |             |
| Δ  | a)        | (UR)<br>Write a program to perform the following operations on a                                                      | 6 Marks            | 13        | CO3      | PO3         |
| ч. | aj        | circular linked list:                                                                                                 | 0 WIAIKS           | ĽJ        | COJ      | 105         |
|    |           | i) Insertion of a node. ii) Deletion of a node.                                                                       |                    |           |          |             |
|    | b)        | Write a menu driven program which will maintain student details                                                       | 6 Marks            | L3        | CO3      | PO6         |
|    |           | 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.                                                                                      |                    |           |          |             |
| 5  | a)        | Convert the following infiv expression to prefix expression                                                           | 6 Marka            | 15        | CO4      |             |
| 5. | <i>a)</i> | ((a * ((b / c) + d))) - (e - (d / f)))                                                                                | U WIAIKS           | LJ        | 004      | ros         |
|    | b)        | Write a program to evaluate a postfix notation and explain with                                                       | 6 Marks            | L3        | CO4      | PO5         |
|    |           | an example.                                                                                                           |                    |           |          |             |
| 6  | - )       | (OR)                                                                                                                  | ( ) ( - 1          | тa        | 004      | DO1         |
| 0. | a)        | i) Inserting an element ii) Deleting an element                                                                       | o Marks            | L2        | 004      | POI         |
|    |           | iii) Searching an element.                                                                                            |                    |           |          |             |
|    | b)        | Discuss how a circular queue is used to overcome the drawback                                                         | 6 Marks            | L2        | CO4      | PO1         |
|    |           | of a linear queue with proper illustration.                                                                           |                    |           |          |             |
|    |           | 1                                                                                                                     |                    |           |          |             |
|    |           | 1                                                                                                                     |                    |           |          |             |

|    |          | (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)<br>b) | Write a program to implement Breadth First Search algorithm.<br>Discuss the operations of a B+-tree with suitable examples.                                                                                                                                             | 6 Marks<br>6 Marks | L3<br>L2 | CO5<br>CO5 | PO5<br>PO2 |

Roll No.

### 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

# Answer One Question from each Unit

Max. Marks: 60

SVEC-19

## 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 |
|    | , i i i i i i i i i i i i i i i i i i i | (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 | 6 Marks | L3 | CO1 | PO4 |
|    | , i i i i i i i i i i i i i i i i i i i | the length of the CPU burst time given in milliseconds.            |         |    |     |     |

| e ouise unie groen in min |            |  |  |  |  |
|---------------------------|------------|--|--|--|--|
| 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 | 6 Marks | L4 | CO2 | PO3 |
|----|----|-----------------------------------------------------------------|---------|----|-----|-----|
|    | ,  | solution for critical section problem.                          |         |    |     |     |
|    | b) | Using semaphores, explain solution for Producer-Consumer        | 6 Marks | L3 | CO2 | PO5 |
|    |    | classical synchronization problem.                              |         |    |     |     |
|    |    | (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 6 Marks L3 CO3 PO3 of resources R in a system.

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 6 Marks L4 CO4 PO2 table Scheme for handling large address spaces. Under what circumstances is one scheme preferable to the other?
  - b) Discuss about memory protection in contiguous memory 6 Marks L2 CO4 PO1 allocation.

(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                     | 6 Marks | L2 | CO5 | PO1 |
|    |    | allocation and linked allocation?                                           |         |    |     |     |
|    |    | (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 |

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### 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 ]

Max. Marks: 70

Time: 3 hours

#### 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.
- For the configuration of a slider crank mechanism shown in fig, find

   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 °C 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<sup>3</sup> determine the width of the belt if its thickness is 10 mm. The effect of centrifugal tension is to be taken into account?

SVEC-10

- **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         | Α  | В  | С  | D  | Е  | F  |
|--------------|----|----|----|----|----|----|
| No. of teeth | 60 | 40 | 50 | 25 | 30 | 24 |

Determine i) speed of the output shaft ii) output torque iii) holding torque.

Roll No.

### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

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

#### STRUCTURAL ANALYSIS - I [Civil Engineering]

Max. Marks: 70

Time: 3 hours

### 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 14 Marks maximum shear stress of a shaft under both B.M and Torque.

#### (OR)

- 2 At a point in material under stress, the intensity of the resultant stress on a 14 Marks 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:
  - 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 14 Marks the fixed end. Find the deflection and slope under the point load and at the free end using Macaulay's method. Take  $E = 2.1 \times 10^5$  MPa and  $I = 86 \times 10^6$  mm<sup>4</sup>.

#### (OR)

4 Compute the maximum slope and deflection for the beam shown in figure, 14 Marks using Moment-Area method. *EI*=16,000 kNm<sup>2</sup>.



5 What are the assumptions made in the Euler's theory? Derive the critical load 14 Marks formula for a long column with both the ends as fixed.

#### (OR)

6 A 5m long circular column having fixed ends has 240mm external diameter 14 Marks 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.

# UNIT-IV

7 A fixed beam ABC carries a u.d.l of 5kN/m over the entire span and a point load 14 Marks of 5kN at B. If AB= BC=2m and EI = 2000 kN-m<sup>2</sup>, find the fixing moments and the maximum deflection. Also draw the S.F and B.M diagrams.

#### (**OR**)

8 A continuous beam ABC is simply supported at A, B and C. It carries a central 14 Marks 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.

# UNIT-V

- 9 a) Derive an expression for Distortional strain energy per unit volume in terms 7 Marks three principal stresses.
  - b) Design the diameter of a circular shaft subjected to combined bending and 7 Marks twisting with bending moment of 10kN.m and twisting moment of 28kN.m. The safe stress in direct tension is 250MPa and  $\mu$ =0.3.

### (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 7 Marks 2cm x 14cm. Determine the shear centre of the channel section.

Time: 3 hours

Roll No.

### **SREE VIDYANIKETHAN ENGINEERING COLLEGE**

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

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

### FLUID MECHANICS - II

### [Civil Engineering]

Max. Marks: 70

SVEC-14

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

# UNIT-I

1 A flat plate 1.5mx1.5m moves at 45 kmph in stationary air of specific weight 7 Marks a) 11.3N/m<sup>3</sup>. If the coefficients of drag and lift are 0.15 and 0.75 respectively, find lift force, drag force and resultant force. Define displacement, momentum and energy thicknesses. 7 Marks b) (**OR**) Find the displacement thickness, the momentum thickness and energy thickness 2 14 Marks for the velocity distribution in the boundary layer given by  $u/U=2(y/\delta) - (y/\delta)^2$ . UNIT-II 3 Derive the conditions for the rectangular channel of the best section and find 14 Marks the critical depth and critical velocity of the water flowing through a rectangular channel of width 5m, when discharge is  $15 \text{ m}^3/\text{s}$ . (**OR**) Explain the concept of hydraulic jump with a neat sketch and hydraulic jump 4 14 Marks 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. (UNIT-III) 5 Obtain an expression for the force exerted by a jet of water on an inclined fixed 14 Marks 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. (**OR**) 6 Derive the expression for force exerted by a jet on a stationary vertical plate. 7 Marks a) Water is flowing through a pipe at the end of which a nozzle is fitted. The 7 Marks b) 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. UNIT-IV) 7 Explain with a neat sketch of different components of a hydro power plant and 14 Marks 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. (**OR**) 8 Give the classification of hydro power plants. 14 Marks UNIT-V 9 What are all the losses that occur during the operation of a centrifugal pump? 7 Marks a) Expand and explain the term NPSH. 7 Marks b) (**OR**) 10 Explain with neat sketches the working procedures of : 14 Marks i) Jet pump ii) Airlift pump. ନ୍ଦ୍ରେ ٢ŵ ැබ 1

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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 Explain the Static characteristics of instruments. 7 Marks a) A voltmeter is accurate to 98% of its full-scale reading. 7 Marks b) i) If a voltmeter read 200V on 500V range, what is the absolute error? ii) What is the percentage error reading of part (i)? (**OR**) Explain the construction and working of D'Arsonaval Galvanometer. 2 7 Marks a) Explain the essential operating forces that occur on MI and MC type instruments. b) 7 Marks (UNIT-II) 3 Explain measurement of reactive power in three phase balanced and un-balanced 7 Marks a) loads. Explain working principle of LPF Wattmeter. 7 Marks b) (**OR**) Describe the constructional details of an Electrodynamometer type wattmeter and 4 7 Marks a) derive the expression for torque when the instrument is used on a.c. 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 Draw the equivalent circuit and phasor diagram of a current transformer and b) 7 Marks derive the expression for ratio and phase angle errors. (**OR**) Briefly describe single phase Electro dynamo meter type power factor meter. 6 7 Marks a) Explain the disadvantages of shunts and multipliers when used for extension of b) 7 Marks range. Explain how instrument transformers are a better substitute for shunts and multipliers especially for high range values. ( UNIT-IV ) Explain the suitable bridge used for the measurement of high resistance. 7 a) 7 Marks Writ a short notes on Megger and Q-meter. 7 Marks b) (**OR**) 8 Derive the equations of balance for an Anderson's bridge. Draw the phasor 8 Marks a) diagram for conditions under balance. Derive the equations of balance for Schering bridge. Draw the phasor diagram for b) 6 Marks under balance condition. UNIT-V 9 Explain the Lissajous Patterns for the measurement of Phase and Frequency. 8 Marks a) List the Applications of Oscilloscopes. 6 Marks b) (**OR**) Write short notes on the following: 14 Marks 10 i) Digital frequency meter. ii) Dual slope digital volt meter.

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Max. Marks: 70

### 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

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

### UNIT-I

- 1 With relevant phasor diagrams, explain the operation of a single phase 8 Marks a) transformer operating on lagging and leading power factor loads. Classify various types of transformers and explain them in brief. 6 Marks b) (**OR**) 2 Derive the EMF equation of a transformer. Hence derive transformation ratio. 7 Marks a) Discuss the effect of variations of frequency and voltage on iron loss. How will **b**) 7 Marks you minimize the hysteresis and eddy current loss that occur in a practical transformer? UNIT-II 3 With neat diagram, explain the various tests conducted on transformer to obtain 14 Marks its equivalent circuit. Derive all related equations.  $(\mathbf{OR})$ Draw the vector diagrams of transformer at load with lagging and leading power 4 6 Marks a) factors. Calculate the voltage regulation for a 200/400 V, 4 kVA transformer at full load 8 Marks b) 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) UNIT-III) What are the various three-phase transformer connections? Explain the star-star 5 8 Marks a) and star-delta connections with neat diagrams. What is meant by Scott connection of transformers? Explain its significance and 6 Marks b) applications. (**OR**) A three phase transformer has 400 turns on the primary and 40 turns on the 8 Marks 6 a) 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. b) Explain the desirable conditions for the parallel operation of 3-phase 6 Marks transformers. UNIT-IV)
- 7 a) Show that a three phase winding when excited by a three phase supply 7 Marks establishes a rotating magnetic field.
  - b) The full load power input to a 3-phase induction motor is 50Kw and the slip is 7 Marks 3%. Neglecting stator losses, calculate the full load cu losses and total mechanical power developed.

### (OR)

- 8 a) Compare slip-ring and squirrel-cage induction motor.
  b) Explain air-gap power, internal mechanical power developed and shaft power.
  6 Marks Deduce a relationship between them.
  - 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

7 Marks

# (OR)

- 10 a) Explain auto transformer starting method of 3-phase induction motor.
  - b) The power input to a 3-phase induction motor is 60 KW. The stator losses are 7 Marks 1 KW. Find the mechanical power developed, and the rotor copper loss per phase if the motor is running with a slip of 3%.

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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 COMMUNICATIONS

[Electronics and Communication Engineering]

| Time    | . 2 h         | [Electronics and Communication Engineering]                                                                                                                                                                                                                     | Tomber 70          |
|---------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| 1 11110 | : <b>Э</b> пс | Answer One Question from each Unit<br>All questions carry equal marks                                                                                                                                                                                           | 1ai ks. 70         |
|         |               |                                                                                                                                                                                                                                                                 |                    |
| 1       | a)<br>b)      | Discuss the need for modulation.<br>An AM signal is of form:<br>$S(t)=10(1+0.5\cos 2000\pi t + 0.5\cos 4000\pi t)\cos(2\pi 10^6 t)$ .<br>Sketch the amplitude spectrum and find Average power and Modulation Index.                                             | 6 Marks<br>8 Marks |
| 2       | a)<br>b)      | Explain the generation of the AM signal with switching modulator.<br>With neat block diagram, explain principle and operation of Costas loop.                                                                                                                   | 7 Marks<br>7 Marks |
| 3       | a)<br>b)      | Compare various AM techniques with respect to transmitter power and band width.<br>Explain the generation of SSB wave using phase discriminator method.                                                                                                         | 6 Marks<br>8 Marks |
| 4       | a)<br>b)      | Explain how VSB signal can be demodulated by envelop detector.<br>Why do you prefer VSB modulation scheme in TV signals.                                                                                                                                        | 8 Marks<br>6 Marks |
| 5       | a)<br>b)      | Prove that narrow band FM offers no improvement in SNR over AM.<br>Evaluate the bandwidth requirement for the transmission of FM signal having a frequency deviation 75 KHz and an audio bandwidth of 10KHz.                                                    | 8 Marks<br>6 Marks |
| 6       | a)<br>b)      | Explain the detection of FM wave using balanced frequency discriminator<br>A single tone FM signal is given by $x(t)=10COS(16\pi 10^6t+20 Cos 2\pi 10^3t) V$ .<br>Determine the modulation index, frequency deviation, BW and power associated.                 | 8 Marks<br>6 Marks |
| 7       | a)<br>b)      | <ul> <li>With a neat diagram, explain the operation of a Super heterodyne receiver.</li> <li>Define the terms. <ul> <li>i) Selectivity</li> <li>ii) Sensitivity with respect to a receiver. Also describe the notion of image frequency.</li> </ul> </li> </ul> | 7 Marks<br>7 Marks |
| 8       | a)<br>b)      | Write short notes on Preemphasis and Deemphasis in FM Modulation systems.<br>Derive the SNR in coherent detection and envelope detection of AM signals.                                                                                                         | 7 Marks<br>7 Marks |
| 9       | a)<br>b)      | Explain the generation and demodulation of PPM with the help of block diagram<br>and hence discuss its spectral characteristics.<br>What are the differences between PAM, PWM and PPM.                                                                          | 8 Marks<br>6 Marks |
| 10      | a)<br>b)      | (OR)<br>Differentiate different types of Pulse Modulation schemes.<br>Explain the generation and detection of PAM signals with neat schematics.<br>$\bigotimes \bigotimes \bigotimes$                                                                           | 7 Marks<br>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**

### ELECTRONIC CIRCUIT ANALYSIS AND DESIGN

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours

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

### UNIT-I

1 What do you mean by a multistage amplifier? Explain it briefly. 6 Marks a) Draw the circuit diagram of a Darlington emitter follower and derive the 8 Marks b) expressions for its voltage gain and input resistance. (OR)2 State the various methods of cascading transistor amplifiers. 7 Marks a) With the help of a suitable circuit diagram, explain the working of a RC coupled 7 Marks b) amplifier UNIT-II ) Explain the frequency response of amplifier at low and high frequencies. 7 Marks 3 a) Define  $F_T$ ,  $F\alpha$  and  $F_\beta$  and find relation between  $F_T$  and  $F_\beta$ . b) (**OR**) Derive the expression for the voltage gain of a common drain FET amplifier. 4 a) 7 Marks Sketch the small signal high frequency circuit of CS amplifier and derive the 7 Marks b) expression for voltage gain. (UNIT-III) With a neat sketch, explain the working of RC phase shift oscillator. 5 6 Marks a) Draw the circuit diagram of a voltage series feedback amplifier and derive b) 8 Marks expressions for voltage gain with and without feedback. (**OR**) 6 Explain in detail about the different feedback topologies. a) A transistor Colpitt's oscillator uses a tank circuit with L = 30mH,  $C_1 = 200PF$ b) and  $C_2 = 200$  PF. What is the frequency of oscillators? UNIT-IV 7 a) In what way the design features of power transistors different from small signal 7 Marks transistors? What reasons will you assign for higher conversion efficiency of Class Bb) amplifier as compared to Class A -amplifier? (**OR**) What do you understand by cross-over distortion? How can it be eliminated in 8 a) Class B-operation? Derive an expression for the efficiency of class A - power amplifiers. b) UNIT-V Explain the working of a single-tuned amplifier. 9 a) 6 Marks Derive an expression for the resonance frequency of a parallel resonant circuit 8 Marks b) (**OR**) 10 a) Explain the working of a double-tuned amplifier. 7 Marks Explain in brief, the function of the tank circuit in a tuned-voltage amplifier. b) 7 Marks କ୍ରେ କ୍ରେ 683

Max. Marks: 70

- 8 Marks 6 Marks
  - 7 Marks
- 6 Marks
  - 8 Marks

7 Marks

7 Marks

### **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 7 Marks  $y(n) = x^2(n)$ . Is this system (i) static or dynamic and (ii) linear or non-linear?
  - b) Find the step response of an LTI system whose unit impulse response is given by 7 Marks  $h(n) = (0.5)^n u(n)$ .

### (OR)

2 a) Find the convolution sum of sequences x(n) and y(n) for n = 0, 3, 5 and 10 if 7 Marks  $x(n) = (3/4)^n u(n)$  and y(n) = u(n).

b) For what range of values of the parameter  $\alpha$  are the systems defined by the 7 Marks following difference equations stable?  $y(n) - a^2 y(n - 2) = x(n - 3)$ 

### 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.

. iv) integration property.

### (UNIT-III)

- 5 a) Find the Auto-Correlation of  $f(t) = \cos(\omega_0 t)$  and sketch.
  - 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 8 Marks approach
  - b) Determine the Nyquist sampling rate and Nyquist sampling interval for the 6 Marks signals (i) sinc(100nt). (ii) sinc(100nt) + sinc(50nt).

- 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 y''(t) + 5y'(t) + 6y(t) = x(t) 7 Marks with initial conditions y(0) = 2, y'(0) = 1, and  $x(t) = e^{-t} u(t)$ .

b) Find the inverse Laplace transform of 
$$X(s) = (-5s-7)/(s+1)(s-1)(s+2)$$
 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 7 Marks the input x[n] is u[n]. Find the impulse response h[n] of the system.

### (OR)

10 a) Explain geometric evaluation of Fourier Transform from pole-zero plot.7 Marksb) 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 ho   | Ma<br>Answer One Question from each Unit                                                                                                                 | x. Marks: 70       |
|------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
|      |          | 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:                                                                                                 | 8 Marks            |
|      |          | i) NAND gate. ii) NOR gate.                                                                                                                              |                    |
| 2    | a)       | (UK)<br>Explain basic laws of Boolean algebra with examples                                                                                              | 7 Marks            |
| 2    | b)       | Simplify the expression $Z = AB'C' + AB'C + ABC$ using Boolean laws                                                                                      | 7 Marks            |
|      | 0)       |                                                                                                                                                          | / 1/14/165         |
| 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 followin                                                                                | g 8 Marks          |
|      |          | Boolean function and draw logic circuit.<br>$E(A = B, C, D) = \sum m(0.1.4, 6.8, 0.10, 12) + \sum d(2.7, 12, 14, 15)$                                    |                    |
|      | h)       | $\Gamma(A, B, C, D) = \sum \prod (0, 1, 4, 0, 0, 7, 10, 12) + \sum (0, 7, 13, 14, 13)$<br>Show that the dual of the exclusive -OR is also its complement | 6 Marks            |
|      | 0)       | UNIT-III                                                                                                                                                 | 0 Warks            |
| 5    | a)       | Design a combinational circuit for 4-bit Adder/Subtractor.                                                                                               | 6 Marks            |
| -    | b)       | Design a BCD to Excess-3 code converter.                                                                                                                 | 8 Marks            |
|      | ŕ        | (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            |
| 0    | ``       |                                                                                                                                                          | 0 M 1              |
| 8    | a)       | Design a decade asynchronous counter with timing diagrams.                                                                                               | 8 Marks<br>6 Marks |
|      | 0)       | UNTT-V                                                                                                                                                   | 0 Marks            |
| 0    | a)       | Describe the design procedure for asymphronous sequential circuits                                                                                       | 6 Marks            |
| 9    | a)<br>b) | Find a circuit that has no static hazards and the Boolean function                                                                                       | n 8 Marks          |
|      | 0)       | $F(A, B, C, D) = \sum m(1, 3, 5, 7, 8, 9, 14, 15).$                                                                                                      |                    |
|      |          | (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 functio                                                                             | n 7 Marks          |
|      |          | $F(A,B,C,D) = \sum (0,2,6,7,8,10,12).$                                                                                                                   |                    |

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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

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

### UNIT-I

1 Synthesize A<sub>I</sub>, A<sub>V</sub> R<sub>I</sub> and R<sub>0</sub> for a single stage CE amplifier with un by passed 14 Marks emitter resistance, R<sub>S</sub>=1K $\Omega$ , R<sub>1</sub>=50K $\Omega$ , R<sub>2</sub>=2K $\Omega$ , R<sub>C</sub>=1K $\Omega$ , R<sub>E</sub>=270 $\Omega$  and R<sub>L</sub>=1.2K $\Omega$ . The h-parameters given are h<sub>ie</sub>=1100 $\Omega$  and h<sub>fe</sub>=50.

#### (OR)

2 Estimate  $g_m$ ,  $g_{b'e}$ ,  $c_e$  and  $\omega_\beta$  for a transistor at  $I_C=1mA$  and  $V_{CE}=10V$ . The 14 Marks datasheet shows the values as  $C_C=3PF$ ,  $h_{fe}=200$ ,  $\omega_T=500rad/sec$ . Formulate the expressions used.

### UNIT-II)

- **3** a) Draw the circuit diagram of voltage shunt feedback amplifier and derive 10 Marks expressions for voltage gain and feedback factor.
  - b) Explain the concept of feedback as applied to electronic amplifier circuit. What 4 Marks are the advantages and disadvantages of positive and negative feedback?

#### (OR)

- **4** a) Show that the gain of Wien bridge oscillator using BJT amplifier must be at 10 Marks least 3 for the oscillations to occur.
  - b) Explain the concept of feedback in oscillators.

### (UNIT-III)

5 a) Derive the conversion efficiency of a Class-B amplifier. 7 Marks
b) Compute the effective load resistance R<sub>L</sub> seen looking into the primary of 8:1 7 Marks transformer connected to the output load of 20Ω.

#### (OR)

- 6 a) Distinguish between Class-A, Class-B and Class-AB amplifiers with neat 7 Marks diagrams.
  - b) Describe the second harmonic distortion in power amplifiers. 7 Marks

### UNIT-IV

- 7a)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 14 Marks the applications of the above circuit? Derive the expressions for UTP and LTP.

#### (**OR**)

- 10 Describe Monostable multivibrator. Explain with the help of a neat circuit 14 Marks 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.
  - \$} {} {}

Max. Marks: 70

4 Marks

SVEC-14

**CODE No.:14BT40432** 

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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

#### **DATA COMMUNICATIONS**

[Information Technology]

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 |

Explain how statistical TDM is different from conventional TDM. 7 Marks b)

### UNIT-IV

- Explain in detail about basic telephone call procedures. 7 Marks 7 a) 7 Marks
  - Explain about working of caller ID when it is used. b)

(**OR**)

- Describe processes of C-message noise weighting and give its significance. 7 Marks 8 a)
  - Discuss in detail about the conditions that are addressed by facility parameters. 7 Marks b)

## UNIT-V

- 9 Explain Cellular concept. Define Frequency Reuse mechanism and explain Cell 8 Marks a) Splitting with net sketches. Write about different Hand-off mechanisms. 6 Marks b) (**OR**) Explain in detail about cellular telephone network components. 7 Marks **10** a)
  - Briefly describe AMPS cellular telephone system. 7 Marks b)

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Time: 3 hours

SVEC-14

CODE No.:14BT41201

SREE VIDYANIKETHAN ENGINEERING COLLEGE

Roll No.

(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

SVEC-14

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

# UNIT-I

| 1  | a) | Explain the difference between Procedure Oriented Programming and Object<br>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 |
|    |    | \$\$ \$\$ \$\$                                                                                                                            |         |

Time: 3 hours

SREE VIDYANIKETHAN ENGINEERING COLLEGE

Roll No.

(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]

Max. Marks: 70

SVEC-14

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

# 

a) What are the effects of feedback on Sensitivity and external noise?
b) For the mechanical system, draw the electrical analogous circuits based on 7 Marks Torque-Voltage and Torque-Current analogy along their equations.



### (OR)

- 2 a) Develop the block diagram for armature controlled DC motor.
  - b) Determine the overall transfer function for the system shown in the figure using 7 Marks block diagram reduction technique.



- 3 a) Find K<sub>p</sub>, K<sub>v</sub> and K<sub>a</sub> for the open-loop transfer function of a unity feedback 4 Marks system given by  $G(s) = \frac{10}{s(0.1s+1)}$ .
  - b) Derive the expressions for under damped second order system with unit step 10 Marks input.

### (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 8 Marks G(s)=100/s(1+0.1s), for the input  $r(t)=1+2t+(t^2/2)$ .

# (UNIT-III)

- 5 a) Determine the range of values of K such that the characteristic equation  $s^3$  7 Marks  $+ 3(K+1)s^2 + (7K+5)s + (4K+7) = 0$  has roots more negative than s = -1.
  - 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 8 Marks function  $G(s) = \frac{K}{s(s+2)(s+4)}$ .
  - b) Discuss the effect of addition of poles and zeros to the open loop transfer 6 Marks function.



### (UNIT-IV)

7 Sketch the bode plot of the system with open loop transfer function  $G(s)=1/s^2(1+s)$  14 Marks (1+2s), Find gain margin and phase margin of the system.

### (OR)

- 8 a) State and explain Nyquist stability criterion to determine the stability of a system.
  b) Sketch the polar plot and determine gain margin and phase margin for open loop
  8 Marks
  - transfer function of unity feedback system G(s) = 1/s(s+2)(s+4).

# UNIT-V

a) Define the terms State variable and state transition matrix.
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).
6 Marks
8 Marks

### (OR)

10 a) Obtain state variable representation of a armature controlled DC motor.6 Marksb) Convert the given system matrix into diagonal form.8 Marks

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

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### 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 14 Marks normal stress and shear stress along the two planes at right angles.

#### (OR)

2 The stress on two perpendicular planes through a point are 60 N/mm<sup>2</sup> (tension), 14 Marks 40 N/mm<sup>2</sup> (compression) and 30 N/mm<sup>2</sup> (shear). Find the stress components and the resultant of stresses on a plane at 60 deg to that of the tensile stress.

### UNIT-II

3 A cantilever beam of length 7m, carries a point load at a distance of 4m from the 14 Marks fixed end. Find the deflection and slope under the point load and at the free end using Macaulay's method. Take  $E = 2.1 \times 10^5$  MPa and  $I = 86 \times 10^6$  mm<sup>4</sup>.

#### (OR)

A simply supported rectangular R.C beam is of length 3m and cross section 14 Marks 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  $E = 1 \times 10^4 \text{ N/mm}^2$ .

### UNIT-III)

5 What are the assumptions made in the Euler's theory? Derive the Euler's critical 14 Marks load formula for long column with both ends hinged.

#### (OR)

6 A hollow cylinder cast iron column is 4m long with both ends fixed. Determine 14 Marks 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  $\sigma_c$ =550MN/m<sup>2</sup>.

## UNIT-IV

7 A fixed beam AB of length 5m is carrying a point load of 20kN at C. Find the 14 Marks fixed end moments if AC= 2m and CB= 3m. Draw the S.F and B.M diagrams. If EI= 2400 kN-m<sup>2</sup>, find the location and magnitude of maximum deflection and deflection at C.

### (OR)

8 A continuous beam ABC is simply supported at A, B and C and having 14 Marks 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.

## UNIT-V

A beam of rectangular section 180mm wide and 260mm deep is used over a 14 Marks 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<sup>o</sup> with the vertical plane of symmetry. Find the direction of the neutral axis and the maximum bending stresses in the beam.

### (OR)

1
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.

(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

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

## UNIT-I

| a) | A flat plate 2m x 2m is immersed in water flowing with a velocity of 5m/s. Find | 7 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----|---------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | the forces of drag and lift as 0.05 and 0.2 respectively                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| b) | What is Von Karman momentum integral equation and where can it be applied.      | 7 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| -  | (OR)                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|    | Give the characteristics of boundary layer along a thin flat plate.             | 14 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|    | UNIT-II                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| a) | Derive dynamic equation for gradually varied flow.                              | 7 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| b) | When does a hydraulic jump occurs? Also give its applications.                  | 7 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|    | (OR)                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|    | A trapezoidal channel with side slopes of 1 to 1 has to be designed to convey   | 14 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|    | <ul><li>a)</li><li>b)</li><li>a)</li><li>b)</li></ul>                           | <ul> <li>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</li> <li>b) What is Von Karman momentum integral equation and where can it be applied. (OR)</li> <li>Give the characteristics of boundary layer along a thin flat plate. UNIT-II</li> <li>a) Derive dynamic equation for gradually varied flow.</li> <li>b) When does a hydraulic jump occurs? Also give its applications. (OR)</li> <li>A trapezoidal channel with side slopes of 1 to 1 has to be designed to convey</li> </ul> |

 $12m^3$ /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.

## (UNIT-III)

- 5 Obtain an expression for the force exerted by jet of water on a stationary curved 14 Marks 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.

#### (OR)

- 6 A jet of water having velocity of 20m/s strikes a curved vane, which is moving 14 Marks with a velocity of 10m/s. The jet makes an angle of 20° with the direction of motion of vane at inlet and leaves at an angle of 130° 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.

## UNIT-IV

- 7 a) Under what headings the turbines can be classified.
  - b) A pelton wheel has to be designed for the following data: 7 Marks
    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.

#### (OR)

8 Give the classification of hydro power plants.

14 Marks

Max. Marks: 70

7 Marks

## UNIT-V

- 9 a) Water is to be pumped out of a deep well under a total head of 95m. A number 7 Marks 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?
  - b) When do you go for multi stage pumps?

7 Marks

#### (OR)

10 Explain different components of hydropower plant and write the procedure to 14 Marks calculate discharge using mass curve with a neat sketch.

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

#### TRANSFORMERS AND INDUCTION MACHINES

[ Electrical and Electronics Engineering ]

Time: 3 hours

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 7 Marks condition of a single phase transformer with phasor diagram.
  - b) Define Voltage regulation of a transformer. Derive the approximate voltage drop 7 Marks equation for lagging loads.

#### (OR)

- **2** a) Draw and explain the phasor diagram of a transformer for inductive and 7 Marks capacitive loads.
  - b) The efficiency of 1000KVA, 11KV/220V, 50Hz, 1-φ transformer is 98.5% at 7 Marks 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.

## (UNIT-II)

- **3** a) Explain how Sumpner's test is conducted on a pair of transformers with a neat 7 Marks diagram.
  - b) Two single phase transformers with equal turns have impedance of  $(0.5+j3)\Omega$  7 Marks and  $(0.6+j10)\Omega$  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.

#### (**OR**)

- **4** a) Explain how OC and SC tests are conducted on a single phase transformer with 7 Marks neat diagram.
  - b) Explain the operating principle of auto transformer and derive an expression for 7 Marks the saving in copper when compared to an ordinary transformer.

## UNIT-III

- 5 a) Explain the Scott connection with neat diagrams.
  - b) Describe four possible ways of connections of 3-phase transformers with 7 Marks relevant relations amongst voltages and currents on both HV and LV sides.

#### (**OR**)

- 6 a) A 3-phase transformer has 400 turns on the primary and 40 turns on the 8 Marks 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.
  - b) Explain the desirable conditions for the parallel operation of 3-phase 6 Marks transformers.

## (UNIT-IV)

- 7 a) Show that a 3-phase winding when excited by a three phase supply establishes a 7 Marks rotating magnetic field.
  - b) The full load power input to a 3-phase induction motor is 50Kw and the slip is 7 Marks 3%. Neglecting stator losses, calculate the full load cu losses and total mechanical power developed.

#### (OR)

Max. Marks: 70

7 Marks

- 8 a) Draw the speed (vs.) torque curves of slip ring induction motor whose rotor 6 Marks resistance is externally changed such that  $R_3 > R_2 > R_1$ .
  - b) A 3-phase 4kW, 400V, 50Hz, 4 Pole induction motor runs at 1440 RPM at rated 8 Marks 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.

## UNIT-V

9 What is circle diagram? Explain the step by step procedure of drawing the circle 14 Marks diagram from the test data of a 3-phase induction motor and how to calculate its performance under different load conditions.

#### (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 7 Marks 1 KW. Find the mechanical power developed and the rotor copper loss per phase if the motor is running with a slip of 3%.

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

#### ANALOG COMMUNICATIONS [Electronics and Communication Engineering]

Time: 3 hours

2

Max. Marks: 70

#### **Answer One Question from each Unit** All questions carry equal marks

## UNIT-I

1 Describe the detection of AM waves using square-law detector and envelope 7 Marks a) detector with neat diagrams. Explain the generation and detection of DSB-SC Signals. b) 7 Marks (**OR**)

#### Describe the generation of AM signals with Square Law modulator. 8 Marks a) A 1000 KHz carrier is simultaneously AM modulated with 300Hz, 800Hz and b) 6 Marks

2 KHz audio sine waves. What will be frequencies present in the output?

|   |    | 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                            | 7 Marks       |
|   |    | of phase modulated and frequency modulated signals.                                                          |               |
|   | 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       |
| 8 |    | Demonstrate the scheme to study the noise performance of FM systems                                          | 14 Marks      |
| U |    |                                                                                                              | 1 1 101001110 |
|   |    | UNIT-V                                                                                                       |               |
| 9 | a) | Draw the wave forms of PAM, PPM and PWM signals for sinusoidal modulating signal.                            | 7 Marks       |

#### Compare merits and demerits of TDM and FDM multiplexing schemes. 7 Marks b) (**OR**)

Describe generation and detection of PAM signals with neat schematics. 8 Marks 10 a) 6 Marks Discuss various applications of pulse modulation schemes. b)

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(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

9

10 a)

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. <b>(OR)</b>                                                                                                                       | 14 Marks           |
| 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)<br>b) | What is meant by feedback? What are the effects of negative feedback?<br>In an RC phase shift oscillator if $R_1 = R_2 = R_3 = 80 \text{ K}\Omega$ and $C_1 = C_2 = C_3 = 10\text{PF}$ .<br>The value of $R_C = 2 \text{ K}\Omega$ . Find the frequency of oscillation.<br>(OR) | 7 Marks<br>7 Marks |
| 6 | a)       | Derive an expression for frequency of oscillation for RC phase shift oscillator                                                                                                                                                                                                 | 9 Marks            |
| Ū | 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            |
| 8 | a)       | Draw the circuit for commonly used class A - amplifier. If the amplifier draws                                                                                                                                                                                                  | 7 Marks            |

10W of dc power, what is the maximum ac power available to the load?

b) What is the basis for the classification of power amplifiers? Mention different 7 Marks types of power amplifiers?

## UNIT-V

| 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 | 8 Marks |
|    | is the resonant frequency of the circuit?                                        |         |
|    |                                                                                  |         |

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

## ELECTROMAGNETIC THEORY AND TRANSMISSION LINES

[ Electronics and Communication Engineering ]

Time: 3 hours

Answer One Question from each Unit All questions carry equal marks

#### UNIT-I

State and explain Coulomb's law. 7 Marks 1 a) Derive the boundary conditions for the tangential and normal components of 7 Marks b) electric fields at the boundary between two perfect dielectrics. (**OR**) Find out capacitance for the coaxial cable. 7 Marks 2 a) Explain about continuity equation. 7 Marks b) UNIT-II ) Explain Ampere's circuital law and its application with one example. 3 a) 7 Marks Illustrate two Maxwell's equations in magneto statics. b) 7 Marks (**OR**) 4 Derive the expression for the energy density in a Magnetic field. 7 Marks a) 7 Marks b) If the magnetic field,  $H = 100 \sin \theta a_{\theta} A/m$  in spherical coordinates, determine  $\vec{J}$  at (10,  $\pi/2$ , 0). UNIT-III) What is the inconsistency in Ampere's Law? How it is rectified by Maxwell? 5 7 Marks a) Explain how the concept of displacement current was introduced by Maxwell to 7 Marks b) account for the production of magnetic fields in the empty space. (**OR**) Express Maxwell's equations in differential form and their corresponding word 6 7 Marks a) statements An electric field in a medium which is source free is given by 7 Marks b)  $\vec{E} = 1.5 \cos(10^8 t = \beta z) \vec{ax} V/m$ . Obtain  $\vec{B}, \vec{H}$  and  $\vec{D}$ . Assume  $\in r=1, \mu_r=1$ and  $\sigma = 0$ . UNIT-IV Derive wave equations in free space. 7 Marks 7 a) Derive the relation between  $\vec{E}$  and  $\vec{H}$  in uniform plane wave. 7 Marks b) (OR) Differentiate Conductors and Dielectrics. Obtain the wave propagation 8 a) 7 Marks characteristics in good dielectrics. b) Prove  $\vec{P} = \vec{E} \times \vec{H}$ . 7 Marks UNIT-V Explain how transmission lines can be used as circuit elements. 9 7 Marks a) Discuss about single stub matching. 7 Marks b) (**OR**) Derive the expression for the characteristic impedance of a Lossless line. 10 a) 7 Marks Write short notes on reflection coefficient, standing wave ratio and transmission 7 Marks b) coefficient. (j) (j) (j)

SVEC-14

Max. Marks: 70

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

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

#### SIGNALS AND SYSTEMS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours

**Answer One Ouestion from each Unit** 

All questions carry equal marks



spectrum for the rectangular pulse train shown below.



|   | 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 | 7 Marks |
|   |    | $x(t) = e^{-t}u(t).$                                                             |         |
|   | 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 |
|   |    | $X(s) = \frac{-3}{(s+1)(s-1)}; \text{ ROC: } -2 < \sigma < 1.$                   |         |
|   |    | (OR)                                                                             |         |

Max. Marks: 70

- 8 a) A certain function f(t) is known to have a transform  $F(s) = \frac{6s^2 + 8s 5}{s(2s^2 + 6s + 5)}$ . 7 Marks Find f(0+) and  $f(\infty)$ . b) Find the inverse Laplace Transform of  $X(s) = \frac{s^2e^{-2s} + 2e^{-3s}}{s^2 + 4s + 3}$ . 9 a) Find the Z-transform of the sequence  $x(n) = (1/4)^n \cos(\pi n/3) u(n)$  and sketch the 7 Marks
  - ROC.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

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(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

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

#### SWITCHING THEORY AND LOGIC DESIGN

## [Electrical and Electronics Engineering, Electronics and Communication Engineering,

**Electronics and Instrumentation Engineering ]** 

Time: 3 hours

Max. Marks: 70

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

## UNIT-I

| 1  | a) | Perform the subtraction of decimal 9137-2345 using 9's complement method?<br>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)                                                                                                                               | <b>5</b> ) ( 1 |
| 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.<br>UNIT-II                                                    | 7 Marks        |
| 3  |    | Obtain the minimal SOP and POS of the following functions using K- Maps:                                                           | 14 Marks       |
| U  |    | i) $F_1(A, B, C, D) = \sum_m (1, 3, 7, 11, 15) + \sum_d (0, 2, 5)$                                                                 | 1 T IVIUIKO    |
|    |    | ii) $F_2(A, B, C, D) = \prod_m (4, 5, 6, 7, 8, 12) + \prod_d (1, 2, 3, 9, 11, 14)$                                                 |                |
|    |    | (OR)                                                                                                                               |                |
| 4  |    | Simplify the following Boolean function using Quine Mc'Clusky method:                                                              | 14 Marks       |
|    |    | $F(A, B, C, D) = \sum_{m} (0, 1, 6, 7, 8, 9, 13, 14, 15).$                                                                         |                |
|    |    | 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                                                           | 6 Marks        |
|    |    | function: $F = \sum_{m} (0, 1, 2, 3, 4, 10, 11, 14, 15)$                                                                           |                |
|    |    | UNIT-IV                                                                                                                            |                |
| 7  | a) | Explain the operation of parallel shift register with parallel load using neat logic                                               | 7 Marks        |
|    | h) | ulagialli.<br>Explain Universal counter with neat diagram                                                                          | 7 Marks        |
|    | 0) | (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-                                                    | 10 Marks       |
|    |    | flop?                                                                                                                              |                |
|    |    | 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:                                                                | 8 Marks        |
|    |    | $F(A, B, C, D) = \sum_{m} (1, 3, 5, 7, 8, 9, 14, 15)$                                                                              |                |
|    |    | (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 $\Gamma(A, B, C, D) = \Sigma(0, 2, (-7, 8, 10, 12))$ | 7 Marks        |
|    |    | $F(A, B, C, D) = \sum (0, 2, 0, 7, 8, 10, 12)$                                                                                     |                |

Time: 3 hours

3

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

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

#### ANALOG ELECTRONIC CIRCUITS [Electrical and Electronics Engineering]

Max. Marks: 70

6 Marks

#### 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. 7 Marks Further explain the role of coupling and bypass capacitors.
  - b) Draw the circuit diagram and equivalent high frequency model of emitter 7 Marks follower.

#### (OR)

- 2 a) Derive the current gain of a CE amplifier with resistive load at high frequencies.
  b) Derive the gain and input impedance of a CE amplifier with emitter resistance.
  7 Marks
  - UNIT-II
  - 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 7 Marks feedback topologies.
  - b) Draw the circuit diagram of Colpitts oscillator and derive the expression for the 7 Marks frequency of oscillations.

## (UNIT-III)

- 5 a) Derive the conversion efficiency of a Class-B amplifier.
   b) Compute the effective load resistance R<sub>L</sub> seen looking into the primary of 8:1
   7 Marks transformer connected to the output load of 20Ω.
  - (OR)
- 6 a) Distinguish between Class-A, Class-B and Class-AB amplifiers with neat 7 Marks diagrams.
  - b) Describe the second harmonic distortion in power amplifiers. 7 Marks
- 7 a) Explain how clipping at two independent levels can be achieved. 8 Marks
- b) Explain positive peak voltage limiters below reference level.

#### (OR)

- **8** a) Draw the circuit diagram of a DC restorer (clamping circuits) and explain its 7 Marks operation with neat diagrams.
  - b) Explain the operation of transistor as a switch with neat diagrams and 7 Marks waveforms.

## UNIT-V

9 Draw the circuit diagram for Schmitt trigger and explain its operation. Give the 14 Marks applications of the above circuit. Derive the expressions for UTP and LTP.

#### (**OR**)

- 10 a) Explain how a Schmitt trigger can be used as a comparator and as a squaring 8 Marks circuit.
  - b) Summarize your understanding on hysteresis and explain how hysteresis can be 6 Marks eliminated in a Schmitt trigger.

SVEC-14

(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:                                                                | 6 Marks  |
|   |    | i) DDL. ii) DML. iii) Database Schema.                                               |          |
|   |    |                                                                                      |          |

## (UNIT-III)

What is meant by SQL? Explain about nested queries and NULL values in SQL. 7 Marks 5 a) Discuss about complex integrity constraints in SQL. 7 Marks b)

#### (**OR**)

Explain in detail about all functional dependencies based normal forms with 6 14 Marks suitable examples.

#### 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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## 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

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

## UNIT-I

| 1  | a)<br>b) | What are the different data types and their ranges in Java?<br>Write a Java program to find the biggest number present in the given array of $n$ numbers.       | 7 Marks<br>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. <b>(OR)</b> | 7 Marks            |
| 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.                                                                                                            | 7 Marks            |
|    |          | i) of ull and gempty.                                                                                                                                           |                    |
|    |          | 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            |

SVEC-14

Max. Marks: 70

(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]

Max. Marks: 70

7 Marks

Time: 3 hours

4

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

## UNIT-I

- 1a)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 7 Marks Torque-Voltage and Torque-Current analogy along their equations.



### (OR)

- 2 a) Develop the block diagram for armature controlled DC motor.
  - b) Determine the overall transfer function for the system shown in the figure using 7 Marks block diagram reduction technique.



UNIT-II

- **3** a) Draw the second order system step response and indicate all time domain 6 Marks specifications.
  - b) A unity feedback system is characterized by the open loop transfer function 8 Marks 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.

#### (OR)

- 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 8 Marks G(s) = 100/s(1+0.1s), H(s) = 5/(s+4) for the input  $r(t) = 1+2t+(t^2/2)$ .

## UNIT-III)

- 5 a) Determine the stability of the control system with characteristics equation 7 Marks  $s^3 + 2s^4 + 2s^3 + 4s^2 + s + 2 = 0$  using Routh Hurwitz Criterion.
  - b) Determine the range of values of K such that the characteristic equation 7 Marks  $s^3 + 3(K+1) s^2 + (7K+5) s + (4K+7) = 0$  has roots more negative than s = -1.

#### (OR)

6 Sketch the root locus diagram for the following open loop transfer function: 14 Marks  $\frac{K}{S(S+4)(S^2+4S+20)}$ 

## UNIT-IV)

Sketch the bode plots showing the magnitude in dB and phase angle in degrees of 7 14 Marks G(s)=10/s(1+0.5s)(1+0.02s). Determine the gain cross over frequency, phase cross over frequency and margins.

#### (OR)

- State and explain Nyquist stability criterion to determine the stability of a system. 7 Marks 8 a) 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 Obtain the state space representation in Phase variable and Jordan form for the 8 Marks b) system whose transfer function is given by T(s) = (s+1)/s(s+4)(s+5).

#### (**OR**)

Find the Eigen value and Eigen vectors of the system represented with state space 7 Marks 10 a)  $\begin{bmatrix} 1 & 0 & 2 \end{bmatrix}$ 

matrix A. Also derive diagonal matrix for the system.  $A = \begin{bmatrix} 0 & 2 & 1 \end{bmatrix}$ 0 0 3

What are the advantages of state variable analysis? Also write the properties of b) 7 Marks state transition matrix.

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#### **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

8

#### **Answer One Ouestion from each Unit** All questions carry equal marks

## UNIT-I

- 1 Explain the need for public awareness about the environment and its CO1 7 Marks a) degradation. What do you mean by forest resource? Explain the direct and indirect CO2 b) 7 Marks
  - benefits of forests.

#### (**OR**)

- Analysis the environmental effects of extracting and using mineral 2 CO<sub>2</sub> 7 Marks a) resources.
  - b) Discuss the reasons for land degradation and suggest the steps to control CO3 7 Marks it.

## UNIT-II)

- 3 What is ecological pyramid? Explain various types of ecological CO<sub>2</sub> 7 Marks a) pyramids.
  - What is meant by bio-diversity and explain the three major components of CO1 b) 7 Marks bio-diversity?

#### (**OR**)

- Analyze the flow of energy through various components of the eco 4 a) CO2 7 Marks system.
  - Analyze the types and characteristics features of a forest ecosystem. b) CO<sub>2</sub> 7 Marks

#### (UNIT-III)

Define solid waste management. Give classification of solid waste and CO1 5 14 Marks discuss the health effects of solid waste pollution.

#### (OR)

6 What is meant my thermal pollution? Describe the control measures can CO3 14 Marks be taken for controlling thermal pollution.

#### UNIT-IV

7 What do you meant by sustainable development? What are the major CO7 14 Marks solutions to attain sustainability?

#### (**OR**)

How the problems can be solved related to Nuclear accidents. CO4 4 Marks a) What are the provisions for the constitution of central and state boards CO8 10 Marks b) under the water Act?

## UNIT-V

9 Discuss the reasons of high population growth in India. 4 Marks CO<sub>2</sub> a) What actions and strategies can be taken to prevent rapid growth of CO1 10 Marks b) population? Explain.

#### (**OR**)

10 Write a report based on the visit in an industrial area. CO9 14 Marks

Max. Marks: 70

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### ELECTRONIC CIRCUIT ANALYSIS AND DESIGN [Electronics and Instrumentation Engineering]

Time: 3 hours

Max. Marks: 70

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

## UNIT-I

- 1 a) Draw the h-parameter equivalent circuit of CE amplifier and derive the CO2 7 Marks expressions for A<sub>v</sub>, A<sub>i</sub>, R<sub>i</sub>, R<sub>0</sub>.
  - b) Explain the operation of Bootstrapped Darlington Circuit with neat CO1 7 Marks diagram.

#### (**O**R)

- 2 a) Draw the h-parameter equivalent circuit of CC amplifier and derive the CO2 8 Marks expressions for A<sub>v</sub>, A<sub>i</sub>, R<sub>i</sub>, R<sub>o</sub>.
  - b) Explain the operation of two stage Transformer coupled amplifier with CO1 6 Marks neat diagram.

### (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 CO2 8 Marks source amplifier at high frequencies.

#### (OR)

- 4 a) Short circuit CE current gain of a transistor is 25 at a frequency of 2MHZ. CO4 6 Marks If  $f_{\beta} = 200$ KHZ, calculate (i)  $f_{T}$  (ii)  $h_{fe}$  (iii) Find the  $|A_{I}|$  at frequency of 10MHZ and 100 MHZ.
  - b) Derive the expressions for voltage gain, output resistance of common CO2 8 Marks drain amplifier at high frequencies.

## (UNIT-III)

- 5 a) Write the advantages of negative feedback in amplifiers. Why negative CO5 8 Marks feedback is not used in oscillators.
  - b) In a transistorized Hartley oscillator, two conductances are 2mH and CO3 6 Marks  $20\mu$ H, while the frequency is to be changed from 950KHZ to 2050KHZ. Calculate the range over which the capacitor is to be varied.

#### (OR)

- 6 a) Draw the wein bridge oscillator and explain its operation and derive an CO1 8 Marks expression for frequency of oscillations.
  - b) Calculate the gain, input resistance, output resistance of voltage series CO4 6 Marks feedback amplifier having A=300,  $R_i=1.5K\Omega$ ,  $R_0=50K\Omega$  and  $\beta=1/20$ .

## UNIT-IV

- 7 a) Explain the advantages of push-pull amplifiers. Derive an expression for CO3 7 Marks the efficiency of a class-B push pull amplifier.
  - b) Explain the operation of class-B push pull amplifier with a neat diagram CO1 7 Marks and derive the expression for efficiency.

(**OR**)

- 8 a) Explain the classifications of power amplifiers based on the period of CO1 4 Marks conduction.
  - b) A single stage class–A amplifier has  $V_{CC} = 20$  volts,  $V_{CEQ} = 10$  volts, CO4 10 Marks  $I_{CQ} = 600$ mA and collector load resistor  $R_L = 16\Omega$ . The AC output current varies by  $\pm 300$ mA 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.

## UNIT-V

- 9 a) Explain the working of single tuned amplifier with a neat diagram. Draw CO1 8 Marks the frequency response of single tuned amplifier.
  - b) With a neat circuit diagram, explain the operation of class-C tuned CO1 6 Marks amplifier.

(OR)

- 10 a) With a neat diagram, explain working of stagger tuned amplifier with its CO1 8 Marks frequency response.
  - b) A single tuned RF amplifier uses a transistor with an output resistance of CO4 6 Marks 50K $\Omega$ , output capacitance of 15PF and input resistance of next stage is 20k $\Omega$ . The tuned circuit consists of 47PF capacitance in parallel with series combinations of 1 $\mu$ H inductance and 2 $\Omega$  resistance. Calculate:
    - i) Resonant frequency.
    - ii) Effective quality factor.
    - iii) Bandwidth of the circuit.

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Time: 3 hours

Roll No.

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### SIGNALS AND SYSTEMS [Electronics and Instrumentation Engineering]

Max. Marks: 70

SVEC-16

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

### UNIT-I

1 Write the properties of Dirac-delta function. 6 Marks a) CO1 Show that if the two signals  $f_1(t)$  and  $f_2(t)$  Are orthogonal over an interval CO<sub>2</sub> 8 Marks b)  $t_1$  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  $f_2(t)$ . (**OR**) 2 What are the three elementary operations in block diagram representation CO2 6 Marks a) of continous time system? Determine whether the system is linear, time invariant, causal and CO2 8 Marks b) memory less.  $y(t) = \frac{1}{2} \int_{-\infty}^{t} x(z) dz$ UNIT-II Find the exponential fourier series of the waveform and also draw the CO4 3 a) 8 Marks frequency spectrum. x(t) = A for  $0 \le t \le \pi$ -A for  $\pi \le t \le 2 \pi$ Represent the function  $e^t$  over the interval  $0 \le t \le 1$  by using trigonometric CO1 6 Marks b) fourier series. (**OR**) 4 Define fourier transform and state any four properties. CO1 6 Marks a) Find the fourier transform of signum function and unit step function. CO4 8 Marks b) UNIT-III) 7 Marks 5 a) If  $x(t) = Sin \omega_0 t$ , find (i)  $R(\tau)$ ; (ii) *ESD*. CO1 Verify Parseval's theorem for the energy signal  $x(t) = e^{-4t} u(t)$ . CO4 b) 7 Marks (**OR**) 6 a) Convolve the following signals CO1 7 Marks x[n] = u[n] - u[n-3] $h[n] = (0.5)^n u[n]$ Find the output voltage of the RC lowpass filter shown in figure for an b) CO5 7 Marks input voltage of  $t.e^{-t/RC}$ . UNIT-IV 7 Obtain the relationship between laplace and fourier transforms. CO1 7 Marks a) Find the laplace transform and region of convergence for the following CO4 7 Marks b) signals. i)  $x(t) = e^{-5t} u(t-1)$ ii)  $x(t) = e^t \sin 2t$ . (OR) 8 Find the step response of the series R-L-C Circuit. CO5 8 Marks a) 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 x[n] = a<sup>n</sup> u[n] b<sup>n</sup> u[-n 1] and specify its CO4 6 Marks ROC.

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Roll No.

SVEC-16

### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### SWITCHING THEORY AND LOGIC DESIGN

#### [Electrical and Electronics Engineering]

| Tim | e: 3 h | Durs                                                                                                                                                                                                                    | Max. M | Aarks: 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<br>i).63-35. ii) -82-44. iii) 55+(-18).                                                                                                                 | CO1    | 6 Marks   |
|     | b)     | Carry out the following conversions.<br>Decimal 328.95 to binary, octal and Hexadecimal.                                                                                                                                | CO1    | 6 Marks   |
|     | c)     | Determine the value of base if, $(225)_X = (175)_8$ .<br>(OR)                                                                                                                                                           | CO1    | 2 Marks   |
| 2   | a)     | Simplify the given Boolean functions using basic Boolean theorems.<br>i) $F = \overline{X} + X\overline{Y} + X\overline{Z} + \overline{YZ}$<br>ii) $F = (X\overline{Y} + \overline{WZ})(W\overline{X} + Y\overline{Z})$ | CO5    | 6 Marks   |
|     |        | iii) $F = Y\overline{Z}(\overline{XY} + Y\overline{Z})$                                                                                                                                                                 |        |           |
|     | b)     | Obtain the dual and compliment of the following functions.<br>i) $F = (A\overline{B} + C)\overline{D} + E$                                                                                                              | CO5    | 4 Marks   |
|     |        | ii) $F = (\overline{X + Y + Z}) + XYZ.$                                                                                                                                                                                 |        |           |
|     | c)     | Construct Hamming code for BCD 0110 and BCD 0111. Use even parity.                                                                                                                                                      | CO4    | 4 Marks   |
| 3   | a)     | For the function given below.<br>$f = WXY + X\overline{Y}Z + WX\overline{Y}$                                                                                                                                            | CO1    | 7 Marks   |
|     |        | <ul> <li>i) Express 'f' in standard SOP form.</li> <li>ii) Simplify using K-map.</li> <li>iii) Realize 'f' using NAND gates only.</li> </ul>                                                                            |        |           |
|     | b)     | For the function given below, obtain the simplified expression in product of sum form using k-maps                                                                                                                      | CO1    | 7 Marks   |
|     |        | i) $F(A, B, C, D) = 2M(0, 2, 4, 6, 8, 9, 10, 11, 12, 14).$<br>ii) $F(A, B, C) = \overline{AC} + \overline{BC} + ABC$ .                                                                                                  |        |           |
|     |        | (OR)                                                                                                                                                                                                                    |        |           |
| 4   | a)     | Simplify the Boolean expression $F=\sum_{w,x,y,z} 1,3,7,11,15 + d(0,2,5)$ using K-map and indicate the prime implicants.                                                                                                | CO1    | 7 Marks   |
|     | b)     | Obtain the minimal expression for $f=\Sigma m(1,2,3,5,6,7,8,9,12,13,15)$ 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                                                                                                                                                                          | CO5    | 5 Marks   |
|     |        | $f(A, B, C, D) = \Sigma m(2, 4, 5, 7, 10, 14)$                                                                                                                                                                          |        |           |
|     | c)     | Design an 16:1 multiplexer using NOR gates only.<br>(OR)                                                                                                                                                                | CO2    | 5 Marks   |
| 6   | a)     | Design a BCD to excess-3 code converter circuit.                                                                                                                                                                        | CO4    | 7 Marks   |
|     | D)     | implement full subtractor using two half subtractors and justify the answer.                                                                                                                                            | 002    | / 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                                       | CO6 | 7 Marks  |
|    |    | and shift-right operations are performed with relevant output waveforms.                                         |     |          |
|    |    | (OR)                                                                                                             |     |          |
| 8  | a) | With a suitable example, explain Moore and Mealy circuits.                                                       | CO3 | 4 Marks  |
|    | b) | Design a sequence generator to generate the sequence $0 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 1$ | CO4 | 10 Marks |
|    |    | and avoid the lockout condition using J-K flip-flops.                                                            |     |          |
|    |    | UNIT-V                                                                                                           |     |          |
| 9  | a) | Realize the following functions using PAL and draw the logic diagram                                             | CO2 | 7 Marks  |
|    |    | using PAL                                                                                                        |     |          |
|    |    | $Y_1(P, Q, R, S) = \Sigma m(3,5,6,7,8,11,13,14,15)$                                                              |     |          |
|    |    | $Y_3(P, Q, R, S) = \Sigma m(0, 1, 5, 6, 8, 9, 11, 13, 14)$                                                       |     |          |
|    | b) | Design and implement 4-bit Binary to Graycode convertor using a suitable                                         | CO2 | 7 Marks  |
|    |    | PLA.                                                                                                             |     |          |
|    |    | (OR)                                                                                                             |     |          |
| 10 | a) | Explain the PAL with neat sketch.                                                                                | CO2 | 4 Marks  |
|    | b) | Implement the following two Boolean functions with PLA                                                           | CO2 | 10 Marks |
|    |    | $F_1(A,B,C) = \Sigma_m(0,1,2,4,)$                                                                                |     |          |
|    |    | $F_2(A,B,C,) = \Sigma_m(0,5,6,7)$                                                                                |     |          |

\$\$ \$\$ \$\$

 $F_3(A,B,C,) = \Sigma_m (1,3,5,6).$ 

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

# CONCRETE TECHNOLOGY

## [Civil Engineering]

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<br>and hardened concrete of the following items. Also explain their<br>influence on the durability of concrete. | CO1   | 14 Marks                                |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----------------------------------------|
|   | i) Tricalcium Aluminate. ii) Tricalcium Silicate.                                                                                                                                       |       |                                         |
|   | iii) Heat of Hydration. iv) Gel-Space Ratio.                                                                                                                                            |       |                                         |
|   | (OR)                                                                                                                                                                                    |       |                                         |
| 2 | Explain in detail the influences of following aspects on the concretes:<br>i) Interfacial Transition Zone.                                                                              | CO1   | 14 Marks                                |
|   | 11) Explain difference between angular aggregates and                                                                                                                                   |       |                                         |
|   | rounded aggregates.                                                                                                                                                                     |       |                                         |
|   | 111) Effect of maximum size of aggregate.                                                                                                                                               |       |                                         |
|   | iv) Explain the uses of Zone-1 and Zone-4 fine aggregates.                                                                                                                              |       |                                         |
|   |                                                                                                                                                                                         |       |                                         |
| 3 | Explain the following properties of fresh concretes:                                                                                                                                    | CO2   | 14 Marks                                |
|   | i) w/c ratio ii) Bleeding                                                                                                                                                               | 002   | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 |
|   | iii) Segregation iv) Plastic Shrinkage                                                                                                                                                  |       |                                         |
|   | (OR)                                                                                                                                                                                    |       |                                         |
| 4 | Explain the following properties of hardened concretes:                                                                                                                                 | CO2   | 14 Marks                                |
|   | i) Porosity and Permeability.                                                                                                                                                           |       |                                         |
|   | ii) Interfacial Transition Zone (ITZ.                                                                                                                                                   |       |                                         |
|   | iii) Honey combing.                                                                                                                                                                     |       |                                         |
|   | iv) Factors affecting the strength of the concrete.                                                                                                                                     |       |                                         |
|   | UNIT-III)                                                                                                                                                                               |       |                                         |
| 5 | Explain in detail about the following NDT tests on concrete.                                                                                                                            | CO5   | 14 Marks                                |
|   | i) Ultrasonic Pulse Velocity Test.                                                                                                                                                      |       |                                         |
|   | ii) Rebound Hammer Test.                                                                                                                                                                |       |                                         |
|   | iii) Core Drilling.                                                                                                                                                                     |       |                                         |
|   | iv) Cut and Pull Out Test (CAPO).                                                                                                                                                       |       |                                         |
|   | (OR)                                                                                                                                                                                    | ~ ~ . |                                         |
| 6 | Explain in detail the following item:                                                                                                                                                   | COI   | 14 Marks                                |
|   | 1) Modulus of Elasticity of the concrete.                                                                                                                                               |       |                                         |
|   | 1) Dynamic Modulus of the concrete.                                                                                                                                                     |       |                                         |
|   | 111) Poisson's Ratio.                                                                                                                                                                   |       |                                         |
|   | iv) Drying Shrinkage of the concrete.                                                                                                                                                   |       |                                         |

Time: 3 hours

## UNIT-IV

7 Design a concrete mix using 30 percent fly ash as part replacement of CO3 14 Marks cement (assume in case, if any data is not given):

| Dog | mir | om   | on  | te | • |
|-----|-----|------|-----|----|---|
| ncy | uII | CIII | CII | 13 | • |

| 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/n  | n3,            |
| 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:                        | Pumpin   | g,             |
| xi) Degree of Supervision:                   | Good,    |                |
| xii) Type of Aggregate:                      | Crushed  | l Angular,     |
| xiii) Maximum Cement Content(OPC):           | 450kg/n  | n <sub>3</sub> |
| xiv) Chemical Admixture Used:                | Super P  | lasticizer     |
| 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 Aggre  | gate: 2  | 2.8 percent,   |
| viii) Total moisture content in Fine Aggrega | te: 4    | 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   | Maximum      | Volume of Coarse Aggregate per Unit |        |        |        |
|----|---------------|--------------|-------------------------------------|--------|--------|--------|
|    | Size of       | Water        | Volume of Total Aggregate for       |        |        |        |
|    | Aggregate(mm) | Content (kg) | 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 concr<br>of pavements, using Rounded Aggregate and using | ACI method. The data     | CO3 | 14 Marks |
|----|------------------------------------------------------------------------------------------------------|--------------------------|-----|----------|
|    | i) Degined Cylindrical Strength:                                                                     | 40MDa                    |     |          |
|    | i) Required Cylindrical Strength:                                                                    | 40 MPa, $25$ mm (slower) |     |          |
|    | ii) Required workability:                                                                            | 25mm (siump),            |     |          |
|    | 111) 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 <sup>3</sup>   |     |          |
|    | 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,             |     |          |
|    | UNIT-V                                                                                               | 1 /                      |     |          |
| 9  | Write short notes on following items:                                                                |                          | CO1 | 14 Marks |
|    | i) Cellular Light Weight concreting,                                                                 |                          |     |          |
|    | ii) High Strength concretes,                                                                         |                          |     |          |
|    | iii) Self-Compacting concretes.                                                                      |                          |     |          |
|    | iv) Light Weight Aggregate concretes,                                                                |                          |     |          |
|    | (OR)                                                                                                 |                          |     |          |
| 10 | Write short notes on following items:                                                                |                          | CO1 | 14 Marks |
|    | i) Heavy Weight Aggregate concretes.                                                                 |                          |     |          |
|    | ii) High Volume Fly Ash concretes.                                                                   |                          |     |          |
|    | iii) Geo Polymer concretes.                                                                          |                          |     |          |
|    | iv) Pervious concretes.                                                                              |                          |     |          |

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Time: 3 hours

Roll No.

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

## STRUCTURAL ANALYSIS - I

## [Civil Engineering]

Max. Marks: 70

SVEC-16

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

## UNIT-I

- a) Direct tensile stresses of 120 MPa and 70 MPa act on a body on mutually CO1 7 Marks 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.
  - b) The magnitude of normal stress on two mutually perpendicular planes, at CO1 7 Marks 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.

#### (**OR**)

2 a) A point in a strained material is subjected to the stresses as shown in CO2 6 Marks figure. Locate the principal planes and evaluate the principal stresses.



b) A point in a strained material is subjected to stress shown in figure. Using CO2 8 Marks Mohr's circle method, determine the normal and tangential stresses across the oblique plane. Check the answer analytically.



- 3 a) Derive the slope at supports and deflection at centre for a simply CO1 7 Marks supported beam carrying uniformly distributed load of w per unit length over the entire span "L".
  - b) A cantilever of length L is loaded with uniformly varying load of CO2 7 Marks 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.

A beam of length 8m is simply supported at is ends. It carries a CO4 14 Marks uniformly distributed load of 40kN/m as shown in figure below. Determine:

в

3m

- i) Deflection at D.
- ii) Maximum deflection.
- iii) Slope at end A.

-1 m- 🖊

0.3.

Take  $E = 2x10^{5}$ N/mm<sup>2</sup> and  $I = 4.3x10^{8}$ mm<sup>4</sup>. 240 kN/m

4m



8m

#### (**OR**)

Euler's critical load for a column with both ends hinged is found as 6 14 Marks CO5 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?

## UNIT-IV

7 Analyze a propped cantilever beam AB of span "L" carrying a Uniformly CO<sub>2</sub> 14 Marks Distributed Load (UDL) on entire span with magnitude of w. Draw the shear force and bending moment diagrams.

#### (**OR**)

8 Draw the bending moment and shear force diagrams of a beam shown in 14 Marks CO6 the Figure which is simply supported at one end and fixed at another end and is continuous over the mid support.



## UNIT-V

9 Explain in detail about maximum shear strain energy theory. a) A bolt of 12mm diameter is subjected to an axial pull of 10kN and a b) 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

#### (**OR**)

- 10 A simply supported beam of a rectangular section 50mm wide and 70mm CO3 deep is subjected to an inclined load P at the mid span. The inclination of the load is  $30^{\circ}$  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<sup>2</sup>. Determine the value of P.
  - çê, (P) <u></u>

4

- 7 Marks CO1
- CO5 7 Marks
  - 14 Marks

Time: 3 hours

| SVEC-10 |
|---------|
|---------|

Roll No.

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

## WATER SUPPLY ENGINEERING

[Civil Engineering]

Max. Marks: 70

Answer One Question from each Unit All questions carry equal marks

## UNIT-I

| 1 | a) | Give reasons for the following:                                                                          | CO1 | 10 Marks |
|---|----|----------------------------------------------------------------------------------------------------------|-----|----------|
|   |    | 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.                                           |     |          |
|   | 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                                             | CO7 | 7 Marks  |
|   | 0) | (TOC) Discuss how these and other tests are used to quantify non-                                        | 007 |          |
|   |    | hiodegradable organics in water                                                                          |     |          |
|   |    |                                                                                                          |     |          |
| • | `` |                                                                                                          | 000 |          |
| 3 | a) | Distinguish between the following:                                                                       | 003 | 6 Marks  |
|   |    | 1) Graphical method and comparative method.                                                              |     |          |
|   |    | 11) Present population and estimated population.                                                         |     |          |
|   | 1) | 11) Continuous supply system and intermittent supply system.                                             | 001 | O.M. 1   |
|   | b) | (OR) What is the principle of centrifugal pump? Explain its component parts.                             | COI | 8 Marks  |
| 4 | a) | What is meant by the term population? What are the various methods                                       | CO4 | 7 Marks  |
|   |    | which are adopted to estimate population of each successive future                                       |     |          |
|   |    | decade?                                                                                                  |     |          |
|   | 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                                 | CO1 | 8 Marks  |
|   |    | detail.                                                                                                  |     |          |
|   | 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                                       | CO3 | 12 Marks |
|   |    | components.                                                                                              |     |          |
|   | 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 |
| 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]

Max. Marks: 70

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

## UNIT-I

- 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 CO1 7 Marks coil instruments. (OR)
- 2 a) The resistance of a moving voltmeter is 11k  $\Omega$ . The moving coil has CO4 7 Marks 100 turns and is 40mm long and 30mm wide. The flux density in the air gap is 0.05 Wb/m<sup>2</sup>. Determine the deflection produced by 220 volts if the spring control gives a defection of 1<sup>o</sup> for a torque of 20 x 10<sup>-7</sup> N-m.
  - b) Explain the working of attraction type and repulsion type moving iron CO1 7 Marks instruments with neat diagrams.

## UNIT-II)

- 3 a) Explain the special features incorporated in an electrodynamometer type CO3 7 Marks of wattmeter so that it can be used for low power factor applications.
  - b) The power input to a 3-phase induction motor is read by two watt meters. CO4 7 Marks The readings are 920W and 300W. Calculate the power factor of the motor.

#### (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 CO4 7 Marks revolutions in 360 seconds. If the normal disc speed is 520 revolutions per kWh, find the percentage error.

## UNIT-III)

5 Derive expression for actual transformation ratio, ratio error and phase CO2 14 Marks angle error of a P.T.

#### (OR)

6 a) Explain the single phase EDM type power factor meter with neat sketch.
b) Explain the characteristics of current transformer.
CO1 7 Marks
CO1 7 Marks

#### (UNIT-IV)

7 Describe the working of Schering Bridge. Derive the expressions for CO2 14 Marks capacitance, dissipation factor and its applications.

#### (OR)

- 8 a) A bridge is balanced at 1,000Hz and has the following constants: CO6 7 Marks 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.
  - b) Explain Anderson's bridge with phase diagram and derive its balance CO2 7 Marks equations.

Time: 3 hours

|    |    | 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 |

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### 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 <b>emf</b> in a transformer.<br>( <b>OR</b> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | CO1 | 6 Marks  |
| 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:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | CO4 | 6 Marks  |
|   |     | i) auto transformer $kVA$ output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |          |
|   |     | ii) kVA transformed and conducted                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |          |
|   |     | UNIT-III)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     |          |
| 5 | a)  | Explain suitable technique to obtain two phase supply from three phase                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | CO5 | 10 Marks |
| - | )   | supply using single phase transformers.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |          |
|   | b)  | Mention few applications of on load tap changing transformers.<br>(OR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | CO6 | 4 Marks  |
| 6 |     | A three phase transformer is used to step down the voltage of a three<br>phase 11kV feeder line. Per phase turns ratio is 12. For a primary line<br>current of 20A, Calculate the secondary line voltage, line current and<br>output kVA for the following connections.<br>i) Star – Delta<br>ii) Star – Star.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | CO4 | 14 Marks |
|   |     | Neglect losses.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |     |          |
| 7 | - ) | Character that the manufactor of manufactor that the second secon | 001 | 7 1 1    |
| / | a)  | Snow that the magnitude of resultant flux remains constant throughout the air gap of three phase induction motor.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | COI | / Marks  |
|   | b)  | Compare the constructional features of squirrel cage and slip ring induction motor.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | CO1 | 7 Marks  |

SVEC-16

- 8 a) Derive the expression for developed torque in a three phase induction CO1 7 Marks motor and find the condition for maximum torque.
  - b) The rotor of a three phase induction motor has  $0.04\Omega$  resistance per phase CO4 7 Marks and  $0.2\Omega$  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.

## UNIT-V

- 9 a) Describe the procedure of no load and blocked rotor test of three phase CO2 7 Marks induction motor.
  - b) Blocked rotor test on a three phase 40kW, 400V, 50Hz 6 pole star CO4 7 Marks 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.

#### (OR)

- 10 a) List various starting methods of three phase induction motors. Explain any CO1 8 Marks one method in detail.
  - b) Explain the principle of operation of induction generator. CO1 6 Marks

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

#### **DESIGN OF MACHINE ELEMENTS-I**

#### [Mechanical Engineering]

Time: 3 hours

#### 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                                      | CO1 | 7 Marks |
|   |    | in design?                                                                                                   |     |         |
|   | b) | The principal stresses induced at a point in a machine component made of                                     | CO2 | 7 Marks |
|   |    | steel 50C4 are as follows.                                                                                   |     |         |
|   |    | (S <sub>yt</sub> = 460 Mpa). $\sigma_1$ = 200 MPa, $\sigma_2$ = 150 MPa, $\sigma_3$ = 0. Calculate factor of |     |         |
|   |    | safety using maximum shear stress theory and distortion energy theory.                                       |     |         |
|   |    | UNIT-II)                                                                                                     |     |         |

- 3 a) What are the factors to be considered while designing machine parts to CO1 4 Marks avoid fatigue failure?
  - b) A machine component is subjected to a flexural stress which fluctuates CO2 10 Marks between +300MN/m<sup>2</sup> and -150MN/m<sup>2</sup>. 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.

#### (OR)

A steel rod is subjected to a completely reversed axial load of 180kN. Find CO3 14 Marks 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.

## (UNIT-III)

- 5 a) Explain the method of determining the size of bolt when the bracket CO1 4 Marks carries an eccentric load perpendicular to the axis of the bolt.
  - b) For supporting the travelling crane in a workshop, the brackets are fixed CO3 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.



Max. Marks: 70

CO3 10 Marks

- 6 a) What is reinforcement in weld? What are its advantages and CO1 4 Marks disadvantages?
  - b) A rectangular steel plate is welded as a cantilever to a vertical column and CO4 10 Marks supports a single concentrated load P, as shown in Figure 2. Determine the weld size, if shear stress in the same is not to exceed 140 MPa. (Dimensions are in mm).



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.

#### (**OR**)

8 Design and draw a protective type of cast iron flange coupling for a steel CO5 14 Marks 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.

## UNIT-V

- 9 Two rods made of plain carbon steel 40C8 ( $S_{yr}$ = 380 MPa) are to be CO3 14 Marks 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

#### (OR)

10 Design a knuckle joint to transmit 150 kN. The design stresses may be CO4 14 Marks taken as 75 MPa in tension, 60 MPa in shear and 150 MPa in compression.

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

#### **DYNAMICS OF MACHINERY** [Mechanical Engineering]

Time: 3 hours

# **Answer One Ouestion from each Unit** All questions carry equal marks

# UNIT-I

- Briefly explain about any two types of clutches with neat diagram. 1 CO1 a) The brake shown in figure has a coefficient of friction of 0.3 and is to CO2 b)
  - operate using a maximum force of F of 400N. If the band width is 50 mm, find the band tensions and the braking torque.

### (**OR**)

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2 What is self-energizing and self-locking brake? Explain. CO1 6 Marks a) An engine developing 30KW at 1250 r.p.m is fitted with a cone clutch. CO2 8 Marks b) The cone face has an angle of 12.5<sup>°</sup>. 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. UNIT-II ) Draw the turning moment diagrams for Four stroke cycle I.C engine, 3 CO1 5 Marks a) neglecting the effect of inertia of the connecting rod. A ship is propelled by a turbine rotor of mass 500 kg and has a speed of CO3 9 Marks b) 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<sup>°</sup> above and 5<sup>°</sup> below the horizontal position, with a time period of 20 seconds. iii) The ship rolls with an angular velocity of 0.04 rad/sec. (**OR**) Discuss briefly about the stability of 2 - wheel drive, when it is taking a 4 CO1 4 Marks a) turn by considering weight of the vehicle, effect of centrifugal and gyroscopic couples. Find the maximum and minimum speeds of a flywheel of mass 3250 kg CO3 10 Marks b) 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.

# Max. Marks: 70

# 4 Marks

10 Marks

# UNIT-III)

- 5 a) Explain in detail about the functioning of centrifugal governor with neat CO1 4 Marks sketch
  - b) All the links of the porter governor are 178mm long and are hinged at a CO3 10 Marks 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° to the vertical. Assuming that friction is constant, determine the range of the speed if the upper arms make an angle of 45° to the vertical.

#### (OR)

- 6 A spring loaded Hartnell governor has arms of equal length. The mass CO2 14 Marks 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.

# UNIT-IV

7 The firing order of a two-stroke-cycle six cylinder engine is 1–5–3–6–2–4. CO4 14 Marks 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.

### (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 CO4 10 Marks make angles 90<sup>o</sup> and 195<sup>o</sup> 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.

# UNIT-V

- A weight of 55N suspended by a spring of 1 N/mm is forced to vibrate by CO5 14 Marks a harmonic force of 9 N. C = 77 N-sec/m. Determine:
  - i) The resonant frequency.

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- ii) The amplitude of mass at resonance.
- iii) The peak amplitude frequency.
- iv) The amplitude at the peak amplitude frequency.

(OR)

10 a) Determine the mass of the system, if  $K_1$ = 2000N/m,  $K_2$ = 1500 N/m, CO1 4 Marks  $K_3$ =3000 N/m,  $K_4$ =  $K_5$ = 500 N/m and natural frequency is 10 Hz.



b) A mass of 2 kg is supported on an isolator having a spring scale of CO5 10 Marks 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.



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Roll No.

#### **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: | CO     | 7 Marks   |
|---|----|-------------------------------------------------------------------------|--------|-----------|
|   |    | i) specific weight. ii) density.                                        |        |           |
|   |    | iii) specific volume. iv) specific gravity.                             |        |           |
|   | b) | A U-tube differential manometer connects two pressure pipes A and       | B. CO2 | 2 7 Marks |

Pipe A contains carbon tetrachloride having a specific gravity 1.594 under a pressure of 11.772 N/ cm<sup>2</sup> and Pipe B contains oil of specific gravity 0.9 under a pressure of 12 N/cm<sup>2</sup>. The pipe a lies 2.5m above pipe B. Find the difference of pressure measured by mercury as fluid filling U-tube.

#### (OR)

- 2 a) Will you state pascal's law in your own words? What is the pressure, in CO1 7 Marks meters of oil (Sp.gr. 0.8), equivalent to 80m of water?
  - b) A differential manometer connected at the two points A and B as shown in CO2 7 Marks figure. At B air pressure is 9.81 N/cm<sup>2</sup> (Abs), find the absolute pressure at A.



- 3 a) Define steady, non-steady, uniform, non-uniform flows. The stream CO2 7 Marks 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  $\Phi$ .
  - b) Water flows in a circular pipe. At one section, the diameter is 0.3m, the CO2 7 Marks 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<sup>3</sup>

#### (OR)

4 If the expression for stream function is described by  $\psi = x^3 - 3xy^2$ , CO<sub>2</sub> 7 Marks a) indicate whether the flow is rotational or irrotational. If the flow is irrotational, determine the expression for velocity potential function. A pitot-tube is inserted in a pipe of 300mm diameter. The static pressure CO4 b) 7 Marks 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<sup>2</sup>. Calculate the rate of flow of water through pipe. If the mean velocity of flow is 0.85 times the central velocity. Take  $C_v = 0.98$ . (UNIT-III) Derive Darcy-Weisbach formula for calculating loss of head due to CO2 5 7 Marks a) 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. b) A 75mm diameter water jet having a velocity of 12m/s impinges on a CO3 7 Marks plane. Smooth plate at an angle of  $60^{\circ}$  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  $998 \text{ kg/m}^3$ . (**OR**) 6 Derive an expression for the head loss due to sudden enlargement in pipe 7 Marks a) CO<sub>4</sub> 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. b) A jet strikes tangentially a smooth curved vane moving in the same CO3 7 Marks direction as the jet, and the jet gets reversed in the direction. Show that the maximum efficiency is slightly less than 60 %. (UNIT-IV) Show that when runner blade angle at inlet of a Francis turbine is 90<sup>o</sup> and 7 CO5 7 Marks a) the velocity of flow is constant, the hydraulic efficiency is given by 2/  $(2+\tan^2 \alpha)$ , Where  $\alpha$  is the vane angle. Describe the following terms related to hydraulic turbines. b) CO3 7 Marks i) Water hammer. ii) Cavitation. iii) Surge Tank. iv) Geometric similarity. (**OR**) A Kaplan turbine operating under a net head of 20 m develops 16 MW 8 a) CO6 7 Marks 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. At a project site, the head available is 160m of water at a flow rate of CO3 b) 7 Marks 0.005m<sup>3</sup>/s. Select and design a suitable turbine to generate power, assuming the required coefficients with justification and stating all the relevant parameters.

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# UNIT-V

- 9 a) Explain the working principle of a single stage centrifugal pump with a CO3 7 Marks neat sketch and also explain briefly mechanical and overall efficiencies of a centrifugal pump.
  - b) Describe construction and working principle of double acting CO3 7 Marks reciprocating pump.

# (OR)

- 10 a) Derive an expression for the work done by the impeller of a centrifugal CO3 7 Marks pump on liquid per second per unit weight of lquid. Explain briefly manometric and volumetric efficiencies of a centrifugal pump.
  - b) Distinguish between Reciprocating and centrifugal pumps. Explain Slip CO3 7 Marks and function of air vessels?

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| COE                                                                   | CODE No.:16BT40304 SVEC-16 |                                                                                                                                                                                         |            |                    |  |
|-----------------------------------------------------------------------|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|--|
|                                                                       |                            | Roll No.                                                                                                                                                                                |            |                    |  |
|                                                                       |                            | SREE VIDYANIKETHAN ENGINEERING COLLEGE<br>(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)                                                                               |            |                    |  |
|                                                                       | Π                          | B.Tech II Semester (SVEC-16) Supplementary Examinations Aug                                                                                                                             | ust – 2    | 021                |  |
|                                                                       |                            | MACHINE TOOLS AND MODERN MACHINING PROCESSE<br>[Mechanical Engineering]                                                                                                                 | S          |                    |  |
| Time                                                                  | e: 3 ho                    | urs                                                                                                                                                                                     | Max. N     | Marks: 70          |  |
| Answer One Question from each Unit<br>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.<br>i) High speed steels. ii) Cemented Carbides.<br>(OR)                                                                             | CO1        | 7 Marks            |  |
| 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           |  |
| 3                                                                     | a)<br>b)                   | List the various work holding devices in lathe. Discuss in detail.<br>Explain the working of Engine Lathe with a neat sketch.                                                           | CO1<br>CO1 | 7 Marks<br>7 Marks |  |
| 4                                                                     | a)<br>b)                   | Discuss about different methods of Taper Turning.<br>Explain the working of Multi Spindle Automatic Lathe.                                                                              | CO1<br>CO1 | 7 Marks<br>7 Marks |  |
| 5                                                                     | a)                         | Explain the specifications and operations performed on a Slotting Machine.                                                                                                              | CO1        | 7 Marks            |  |
|                                                                       | b)                         | Distinguish between Shaper and Planer.<br>(OR)                                                                                                                                          | CO2        | 7 Marks            |  |
| 6                                                                     | a)<br>b)                   | Design a twist drill to perform drilling operation on regular work piece.<br>Explain the working principle of Jig Boring machine.                                                       | CO3<br>CO1 | 7 Marks<br>7 Marks |  |
| 7                                                                     | a)<br>b)                   | Explain the working of Cylindrical grinding machine with a neat sketch.<br>Analyze the need for Truing of grinding wheels.                                                              | CO1<br>CO2 | 7 Marks<br>7 Marks |  |
| 8                                                                     | a)<br>b)                   | Classify Milling machines in detail.<br>List and explain types of milling cutters with neat sketches.                                                                                   | CO1<br>CO1 | 7 Marks<br>7 Marks |  |
| 9                                                                     | a)<br>b)                   | Analyze the importance of chip less machining process in future.<br>Explain the principle involved in Electron Beam Machining.                                                          | CO4<br>CO5 | 7 Marks<br>7 Marks |  |
| 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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#### II B.Tech II Semester (SVEC-16) Supplementary Examinations August – 2021

### THERMAL ENGINEERING - I [Mechanical Engineering]

Max. Marks: 70

#### Time: 3 hours

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

| U | NIT-I | $\supset$ |
|---|-------|-----------|
| - |       | _         |

| 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:                                                                                                                                                     | CO4      | 7 Marks    |
|   |               | 1) Heat loss. (11) Time loss. (111) Blow down loss factors.                                                                                                                |          |            |
|   |               | 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                                                                                                      | CO2      | 7 Marks    |
|   |               | explain about its rating.                                                                                                                                                  |          |            |
|   |               | (UNIT-III)                                                                                                                                                                 |          |            |
| 5 | a)            | What is the difference between Indicated power and Brake power and                                                                                                         | CO2      | 7 Marks    |
|   |               | discuss different efficiencies used in the performance of IC engines                                                                                                       |          |            |
|   | b)            | A 2-stroke CI engine develops a brake power of 3.72kW. Its frictional                                                                                                      | CO3      | 7 Marks    |
|   |               | 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:                                                                                                   |          |            |
|   |               | 1) Indicated Power. 11) Mechanical Efficiency.                                                                                                                             |          |            |
|   |               | 11) Air consumption per hour. (v) Indicated Thermal Efficiency.                                                                                                            |          |            |
|   |               | v) Brake Inermal Efficiency.                                                                                                                                               |          |            |
| 6 |               | (UR)                                                                                                                                                                       | $CO^{2}$ | 14 Mortra  |
| 0 |               | A load test on a 2-shoke engine gave the following results.<br>Sneed $450 \text{ mm}$ $\text{Droke load} = 500\text{N}$ $\text{IMED} = 20 \times 10^4 \text{ N/m}^2$ Eval. | COS      | 14 IVIALKS |
|   |               | speed = 450 1.p.iii. Blake load = 500 N, $IMEr = 50 \times 10^{-1} N/III$ , Fuel consumption = 5.5 kg/hr. Cooling water flow rate = 7 kg/min rise in                       |          |            |
|   |               | consumption – 5.5 kg/m. Cooling water now rate – 7 kg/mm, rise m<br>temperature of cooling water – $40^{\circ}$ C Ambient temperature – $25^{\circ}$ C                     |          |            |
|   |               | Recompetitive of cooling water $-40$ C, Amblent temperature $-25$ C,                                                                                                       |          |            |
|   |               | barometric pressure $-1$ bar, An to rule ratio by weight $-50$ , temperature<br>of exhaust gases $-355^{\circ}$ C mean specific heat of exhaust gases $-$                  |          |            |
|   |               | 1.05  kI/kg K calorific value of fuel used = 42.500 kI/kg hore and                                                                                                         |          |            |
|   |               | stroke = $22$ cm and $27$ cm 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                                                                                                  |          |            |
|   |               | (IINTT-TV)                                                                                                                                                                 |          |            |
| 7 | a)            | Classify the fuels and discuss their relative merits and demerits                                                                                                          | CO5      | 7 Marks    |
| / | $\frac{a}{b}$ | What is meant by Chemically correct air fuel mixture and derive the value                                                                                                  | $CO_{3}$ | 7 Marks    |
|   | υ,            | That is mean by chemically concer an fact mixture and delive the value                                                                                                     | UU r     | / 11101105 |

(OR)

of stoichiometric air fuel ratio value for Octane (C<sub>8</sub> H<sub>18</sub>) fuel.

- 8 Distinguish between Higher and Lower Calorific values and discuss any 7 Marks CO2 a) one method for determination of calorific value of a given solid/liquid fuel. b) The percentage weight analysis of a fuel supplied to an IC engine is as CO5 7 Marks follows: C=85%,  $H_2 = 15\%$ , The air fuel ratio 13.5:1. If all the carbon is burnt either to CO or CO<sub>2</sub> and if there is no free oxygen in the exhaust gases, calculate volumetric analysis of the dry products of combustion. UNIT-V 9 Classify the compressors. CO1 7 Marks a) Explain the working of single stage reciprocating compressor with the b) CO1 7 Marks help of P-V and T-s diagrams. (**OR**) Compare Centrifugal and Axial flow compressors. 10 a) CO2 7 Marks A single stage double-acting air compressor is required to deliver 14m<sup>3</sup> of CO2 7 Marks b) 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.

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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, CO1 4 Marks how we overcome that drawback by using DSB-SC.
  - 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 CO4 6 Marks transmitted into free space using an antenna whose resistance is 5 $\Omega$ . Sketch the spectrum of AM signal and calculate Bandwidth, Power Radiated and Modulation Efficiency.
  - c) Discuss how a message signal recovered from a DSB-SC wave using CO1 4 Marks Coherent Detector.

#### (OR)

- 2 a) Discuss how an envelope detector extracts original message signal from CO1 6 Marks an AM signal.
  - b) An AM transmitter radiates 50W, when the carrier is modulated by a CO4 8 Marks 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.

### UNIT-II

- 3 a) Explain the indirect method of generating WBFM signal. CO1 4 Marks
  - b) Consider an angle modulated signal  $S(t) = 8\cos [8\pi 10^6 t + 2\sin (8\pi 10^3 t)]$ . CO4 10 Marks 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.

#### (**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 CO4 5 Marks maximum frequency deviation of the FM signal.
  - b) Discuss how frequency discrimination method is useful to extract message CO1 7 Marks signal from FM signal.
  - 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  |
|    | <i>.</i> | (OR)                                                                |     |          |
| 8  | a)       | Discuss about the following parameters.                             | CO3 | 6 Marks  |
|    | ,        | i) Selectivity. ii) Sensitivity. iii) Fidelity.                     |     |          |
|    | b)       | Explain the importance of AGC in Super heterodyne receiver.         | CO6 | 5 Marks  |
|    | c)       | What are major problem encountered in Tuned Radio Frequency         | CO3 | 3 Marks  |
|    |          | Receiver?                                                           |     |          |
|    |          | 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

# Answer One Question from each Unit

Max. Marks: 70

# 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.<br>i) Logic Levels.<br>ii) D.C noise margin.                                                                                               | CO5        | 8 Marks            |
|    | b)       | List out the difference between TTL, ECL and CMOS logic family.                                                                                                                                    | CO6        | 6 Marks            |
| 3  | a)       | Explain the following syntax with examples:<br>i) Procedure ii) Task iii) Function                                                                                                                 | CO2        | 9 Marks            |
|    | b)       | What do you understand by gate level modeling? Explain briefly.                                                                                                                                    | CO1        | 5 Marks            |
| 4  | a)       | Explain verilog HDL data type.                                                                                                                                                                     | CO4        | 7 Marks            |
|    | b)       | Discuss different logical operators used in verilog HDL.                                                                                                                                           | CO2        | 7 Marks            |
| 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            |
| 6  |          | (OR)                                                                                                                                                                                               | <b>GO2</b> | 5 ) ( 1            |
| 6  | a)<br>b) | Write Verilog HDL program in behavioural model for 74 x 139 IC.<br>Design a 74 x 181 arithmetic and logic unit. Write a program in data flow modelling.                                            | CO3<br>CO4 | 5 Marks<br>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)<br>b) | Explain the operation of 4-bit ring counter and draw its logic diagram.<br>Explain the operation of a 4 bit synchronous binary counter with the required diagram and waveforms.                    | CO2<br>CO2 | 6 Marks<br>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            |
| 10 | ``       | (OR)                                                                                                                                                                                               | 005        | 7 ) ( 1            |
| 10 | a)       | Explain the necessity of two-dimensional decoding mechanism in<br>memories. Draw MOS transistor memory cell in ROM and explain the<br>operation                                                    | 005        | / 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 CO1 7 Marks potential V and hence deduce that  $E = \operatorname{grad} V$ .
  - b) The potential field at the point  $P(r, \theta, \varphi)$  is  $V = (10/r^2) \sin \theta \cos \varphi$ . CO4 7 Marks Evaluate the value of electric flux density D at  $(2, \pi/2, 0)$ .

#### (OR)

- 2 a) An infinitely long straight filament carrying a direct current I is placed CO1 7 Marks along z-axis. Apply Biot-Savart's law to calculate the value of magnetic field intensity H at the point  $(\rho, \varphi, z)$ .
  - b) An infinitely long filamentary conductor, which carries a current CO4 7 Marks 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).

# UNIT-II)

- 3 a) In a material for which  $\sigma = 5.0$  S/m and  $\epsilon_r = 1$ , the electric field intensity CO2 7 Marks 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.
  - b) Develop the Maxwell's equation,  $\nabla \times E = -\frac{\partial B}{\partial t}$  from Faraday's law of CO1 7 Marks electromagnetic induction.

#### (**OR**)

- 4 a) Develop the boundary conditions on *tangential* and *normal components* of CO1 7 Marks time varying electric field E, across the interface between two media with constants  $\mu_1$ ,  $\in_1$  and  $\mu_2$ ,  $\in_2$ .
  - b) Derive the Maxwell's equations in integral form, from differential form CO2 7 Marks for time harmonic fields, and describe the physical meaning of integral forms.

# UNIT-III)

- 5 a) Define *polarization* of a wave, and describe mathematically *linear*, CO6 7 Marks *elliptical* and *circular* polarizations with illustrating diagrams.
  - b) Derive the expressions for  $\alpha$  and  $\beta$  in terms of the constants of the CO5 7 Marks medium  $\mu$ ,  $\epsilon$  and  $\sigma$  for a *uniform plane wave* propagating in a lossy conducting medium.

#### (OR)

- 6 a) What is Poynting vector? Prove Poynting theorem from first principles. CO5 7 Marks
  - b) Derive the expressions for  $\alpha$ ,  $\beta$ ,  $\nu_p$  and  $\eta$  for the wave propagating in a CO6 7 Marks good dielectric medium.

# UNIT-IV

- 7 a) Obtain the equations for attenuation and phase constants of a transmission CO3 7 Marks line in terms of R, L, C and G.
  - b) Derive the condition for distortion less line and hence justify how the CO2 7 Marks *frequency* and *phase* distortions can be eliminated on a transmission line at low frequency.

### (OR)

- 8 a) The constants of a transmission line are R=6  $\Omega$ /km, L=2.2 mH/km CO3 7 Marks G=0.25x10<sup>-3</sup>mho/km, C=0.005 $\mu$ f/km. Find the attenuation constant, phase shift constant at 1000Hz.
  - b) Define propagation constant. Obtain the expressions for the wavelength CO2 7 Marks and velocity of propagation of voltage and current waves a transmission line.

# UNIT-V

9 a) Discuss the concept of Single stub matching.
b) Define VSWR. Deduce the relation between VSWR and reflection CO4 7 Marks coefficient.

### (OR)

- 10 a) The characteristic impedance of a certain line is  $710 \angle 14^{\circ}\Omega$  and CO1 7 Marks propagation constant of 0.007+j0.028 per km. the line is terminated in a  $300\Omega$  resistor. Calculate the input impedance of the line if its length is 100 km.
  - b) A single stub is to match a  $40\Omega$  line to a load of 200-j $100\Omega$ . The CO4 7 Marks 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.

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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

#### 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                                        | CO4 | 7 Marks  |
|   |            | i) Common Mode Gain (A <sub>c</sub> ); ii) Slew Rate.                                                                                                   |     |          |
|   |            | (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  |
| Δ | 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:                                                                                    | CO4 | 7 Marks  |
|   | ,          | $V_0=10V_{P-P}$ and $f_0=1$ KHz.                                                                                                                        |     |          |
|   |            | (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:                                                                                                          | CO4 | 8 Marks  |
|   |            | i) 50% duty cycle. ii) 70% duty cycle.                                                                                                                  |     |          |
| _ |            | (OR)                                                                                                                                                    |     |          |
| 8 | a)         | A PLL has free running frequency $f_c = 400$ KHz low pass filter bandwidth<br>of 10 KHz. If an input signal frequency applied is 500 KHz, will the loop | CO4 | 9 Marks  |
|   | <b>b</b> ) | Explain the role of low pass filter in PLI                                                                                                              | CO1 | 5 Marks  |
|   | U)         | Explain the fole of low pass filter in f LL.                                                                                                            | COI | JIVIAIKS |

# UNIT-V

- 9 Determine the full scale voltage and resolution of 4-bit DAC for CO4 a) 6 Marks  $V_{REF}$ =12V and 2R=R=10 K $\Omega$ .
  - LSB of a 9-bit DAC is represented by 19.6mV. If an input of all zero bits CO4 b) 8 Marks 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?

#### (**OR**)

- Explain the operation of Dual Slope ADC with a neat sketch. 10 a)
- 7 Marks CO1 A dual slope ADC uses a 16-bit counter and a 4 MHz clock rate. The CO4 7 Marks b) 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.

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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

### PROBABILITY AND STOCHASTIC PROCESS

[Electronics and Communication Engineering]

Time: 3 hours

Max. Marks: 70

SVEC-16

# 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                                                                                                                                                                                                                                                                    | CO1 | 7 Marks |
|   |    | independent, then prove that $\overline{A}_2$ is independent of A <sub>1</sub> .                                                                                                                                                                                                                                                                    |     |         |
|   |    | UNIT-II )                                                                                                                                                                                                                                                                                                                                           |     |         |
| 3 | a) | The density function of a random variable X is given by                                                                                                                                                                                                                                                                                             | CO3 | 8 Marks |
|   |    | $f(x) = \begin{cases} 2e^{-2x}; 0 \le x, \infty \\ 0;  otherwise \end{cases}$                                                                                                                                                                                                                                                                       |     |         |
|   | b) | Find (i) $E(X)$ . (ii) $E(4X-1)$ . (iii) $E(X^2)$ . (iv) $E((X-1)^2)$ .<br>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                                                                                                                                                                                                                                                                                          | CO2 | 7 Marks |
|   |    | $f(x) = \frac{1}{a} [u(x) - u(x - a)]$                                                                                                                                                                                                                                                                                                              |     |         |
|   |    | $f_y(y) = bu(y)e^{-by}$ a > 0, b > 0. Find the density function of W = X + Y, if X and Y are stastically independent.                                                                                                                                                                                                                               |     |         |

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6 a) Let X and Y have joint density function.  

$$f_{XY}(x, y) = \begin{cases} x + y; 0 \le x \le 1, 0 \le 1 \\ 0; \text{ for any other values} \end{cases}$$
Find the conditional expectation of X given Y and Y given X.  
b) Gaussian random variables X<sub>1</sub> and X<sub>2</sub> for which CO3 7 Marks  

$$\overline{X_1} = 2, \overline{X_2} = -1, \sigma_{X_1}^2 = 9, \sigma_{X_2}^2 = 4 \text{ and } C_{X_1X_2} = -3 \text{ are transformed to}$$
new random variables Y<sub>1</sub> and Y<sub>2</sub> according to Y<sub>1</sub> =  $-X_1 + X_2$  and  
 $Y_2 = 0 2X_1 - 3X_2$ . Find  $C_{Y_1Y_2}$  and  $\rho_{Y_1Y_2}$ .  
7 a) Define a K<sup>th</sup> order stationary random processes. When, it will become CO2 7 Marks  
strict sense stationary random processes.  
b) The autocorrelation function of a stationary process is CO3 7 Marks  
 $R_{xx}(\tau) = 25 + \frac{4}{1 + 6\tau^2}$  then find the mean and variance of the process.  
8 a) Define auto correlation function and write its properties.  
b) Explain Gaussian random processes.  
CO2 7 Marks  
(OR)  
8 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 CO4 7 Marks  
b) Develop the expression for noise voltage when resistors are connected in CO4 7 Marks

(OR)

- 10 Develop the expression for Noise Figure and Noise Temperature for CO4 14 Marks cascaded stages of N amplifiers.
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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

#### PULSE AND DIGITAL CIRCUITS

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

Time: 3 hours

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

Max. Marks: 70

# 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<br>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                                                                                             | CO2 | 7 Marks |
|   | ,  | 150V. Sketch the output voltage $v_0$ to the same time scale as the input voltage. Assume ideal diodes.                                                                 |     |         |
|   |    | $+ \circ \qquad $                                |     |         |

# ↓ 100K ↓ 200K ↓ 25V ↓ 100V ↓ UNIT-III ○

V<sup>0</sup><sub>1</sub>

- 0-

| 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     | CO3 | 7 Marks  |
|   |    | oscillator.                                                               |     |          |

(OR)

8 a) How to apply Miller principle to generate sweep voltage?
b) What is linearity correction through adjustment of driving waveform?
CO5 7 Marks
CO4 7 Marks

# UNIT-V

- 9 a) Explain the operation of sampling gate.
  b) Compare the performances of unidirectional and bidirectional sampling CO1 7 Marks gates in all respects.
  (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

\$P \$P \$P

Time: 3 hours

# SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

### **COMPUTER GRAPHICS**

[Computer Science and Engineering]

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                                                                               | CO3      | 10 Marks           |
|    |          | determined by points (20, 10) and (30, 18).                                                                                                            |          |                    |
|    | 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                                                                               | CO2      | 7 Marks            |
|    |          |                                                                                                                                                        |          |                    |
| -  | ``       |                                                                                                                                                        | 001      |                    |
| 5  | a)       | Determine the equation of the Bezier curve for five control points.<br>Evaluate the point at $u = 0.5$ where u is the permutation                      | CO6      | 8 Marks            |
|    | b)       | Evaluate the point at $u = 0.3$ where <b>u</b> is the normalized parameter.<br>Write a procedure to implement Cohen-Sutherland line clipping algorithm | CO3      | 6 Marks            |
|    | 0)       | (OR)                                                                                                                                                   | COJ      | 0 WIAIKS           |
| 6  | a)       | Illustrate Sutherland Hodgeman Polygon clipping algorithm with a neat                                                                                  | CO1      | 8 Marks            |
|    | ,        | example.                                                                                                                                               |          |                    |
|    | 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                                                                               | CO2      | 8 Marks            |
|    |          | in 3D is commutative.                                                                                                                                  |          |                    |
|    | b)       | Write short notes on 3D clipping.                                                                                                                      | CO2      | 6 Marks            |
|    |          | (OR)                                                                                                                                                   | ~ ~ .    |                    |
| 8  | a)       | Explain 3D Translation and Shearing Transformations with an example                                                                                    | COl      | 8 Marks            |
|    | b)       | Differentiate parallel projection and perspective projections.                                                                                         | COI      | 6 Marks            |
|    |          | UNIT-V                                                                                                                                                 |          |                    |
| 9  | a)       | Implement the depth-buffer method to display the visible surfaces of a                                                                                 | CO5      | 8 Marks            |
|    | 1 \      | given polyhedron.                                                                                                                                      | 001      |                    |
|    | b)       | Explain Phong shading technique with an example.                                                                                                       | COI      | 6 Marks            |
| 10 | a)       | (OR)                                                                                                                                                   | CO1      | 8 Marka            |
| 10 | a)<br>b) | Compare and Contrast Gouraud Shading and Phong shading                                                                                                 | $CO^{1}$ | o marks<br>6 Marks |
|    | UJ       | Compare and Contrast Oburatu Shading and I nong shading                                                                                                | 002      | U IVIAIKS          |
|    |          |                                                                                                                                                        |          |                    |

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(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

### DATABASE MANAGEMENT SYSTEMS

[Computer Science and Engineering, Information Technology,

**Computer Science and Systems Engineering**]

Time: 3 hours

#### Max. Marks: 70

# Answer One Question from each Unit

# All questions carry equal marks

# UNIT-I

| 1  | a)            | Compare data models? Explain network, hierarchical and relational model in detail.                                                                                                                                                                                                               | CO1        | 7 Marks            |
|----|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|
|    | b)            | Analyze the responsibilities of DBA and database designers. <b>(OR)</b>                                                                                                                                                                                                                          | CO1        | 7 Marks            |
| 2  | a)<br>b)      | Describe in detail about Entity integrity and Referential Integrity in detail.<br>Consider an E-R diagram for a car-insurance company whose customers<br>own one or more cars each. Each car has associated with it zero to any<br>number of recorded accidents. State any assumptions you make. | CO1<br>CO3 | 7 Marks<br>7 Marks |
| 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            |
|    | ``            |                                                                                                                                                                                                                                                                                                  | 005        | 7 ) ( 1            |
| 4  | a)<br>b)      | Explain the integrity constraints supported by SQL.<br>What is relational algebra? Discuss the various operations of relational algebra                                                                                                                                                          | CO5<br>CO2 | 7 Marks<br>7 Marks |
|    |               |                                                                                                                                                                                                                                                                                                  |            |                    |
| 5  | a)            | Give a detailed description about query processing and optimization                                                                                                                                                                                                                              | CO4        | 7 Marks            |
| 5  | $\frac{a}{b}$ | Write short notes on the following.                                                                                                                                                                                                                                                              | $CO_{4}$   | 7 Marks            |
|    | 0)            | i) Order by clause and LIKE operator. ii) Set operators.<br>(OR)                                                                                                                                                                                                                                 | 000        | , 101001115        |
| 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,                                                                                                                                                                                                                       | CO4        | 7 Marks            |
|    |               | what is the difference between implicit and explicit locking?                                                                                                                                                                                                                                    |            |                    |
| 0  | -)            | (OR)                                                                                                                                                                                                                                                                                             | CO2        | 7 \ ( 1            |
| 8  | a)            | Distinguish serial schedule and serializable schedule. Give relevant                                                                                                                                                                                                                             | 003        | / Marks            |
|    | b)            | What are checkpoints? Explain the purpose of checkpoints mechanism                                                                                                                                                                                                                               | CO3        | 7 Marks            |
|    | 0)            | How often should check points be performed?                                                                                                                                                                                                                                                      | 000        | ,                  |
|    |               | 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            |

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### **INDUSTRIAL INSTRUMENTATION - I** [Electronics and Instrumentation Engineering]

**Time: 3 hours** Max. Marks: 70 **Answer One Question from each Unit** All questions carry equal marks UNIT-I 1 Give three different units of force and summarize different force sensing CO2 7 Marks a) mechanisms. Elaborate on the working principle of torque measurement based on b) CO1 7 Marks Relative angular twist. (**OR**) 2 Explain the following. CO2 14 Marks i) Hydrostatic. ii) Analysis and selection of torque sensors. (UNIT-II) Define relative acceleration. Explain the construction of piezoelectric type CO2 3 7 Marks a) accelerometer in detail. Elaborate on the principle of gyroscope and explain three axis gyro. 7 Marks b) CO2 (OR)4 a) Identify an appropriate sensor for measurement of velocity which CO4 7 Marks consume very little power and explain in detail. Explain the principle and operation of tachogenerators. CO2 7 Marks b) (UNIT-III) 5 a) What is absolute pressure? With neat sketch, explain momentum transfer CO<sub>2</sub> 7 Marks gauge. b) Elaborate on manometer and its types. CO2 7 Marks (**OR**) With neat sketch, explain Mcleod gauge and Knudsen gauge. 6 CO2 7 Marks a) Analyze the requirements for selection of pressure sensors. CO3 7 Marks b) UNIT-IV List the merits and demerits of thermopile and thermocouple. With neat CO4 7 a) 7 Marks sketch, explain them in detail. Elaborate on thermocouple burnout detection and high temperature b) CO2 7 Marks measurement methods. (**OR**) 8 Analyze 2-wire, 3-wire and 4-wire lead resistance methods. CO1 7 Marks a) b) Explain thermoelectric effects and thermocouple laws. CO2 7 Marks UNIT-V 9 Analyze different temperature sensors. 7 Marks CO2 a) Explain about fiber optic thermometer with neat sketch. CO1 7 Marks b) (**OR**) 10 Explain about calibration and simulation for temperature sensors. CO1 7 Marks a) Elaborate on Johnson noise thermometer. CO2 7 Marks b)

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

# 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<br>Amplifier and Non-Inverting amplifier with negative feedback. | CO1      | 7 Marks    |
|----|---------------|--------------------------------------------------------------------------------------------------------------------------------------|----------|------------|
|    | b)            | For 741 op-amp, the parameters given are:                                                                                            | CO1      | 7 Marks    |
|    |               | i) $I_{CQ} = 10 \mu A$ ; ii) $C_c = 33 p f$ .                                                                                        |          |            |
|    |               | 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.                                                            |          |            |
| 2  | -)            | (OR)                                                                                                                                 | CO1      | 0 M1       |
| 2  | a)<br>b)      | Discuss the concept of active load to improve the CMRR.                                                                              | CO1      | 8 Marks    |
|    | 0)            | $R_c = 3.9$ Kohms $R_F = 3.3$ Kohms $V_{cc} = 9V$ and $-V_{FF} = -9V$                                                                | 004      | 0 WIAIKS   |
|    |               |                                                                                                                                      |          |            |
| 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                                                         | CO3      | 7 Marks    |
|    |               | signal with $f_{max}=150$ Hz.                                                                                                        |          |            |
|    | ``            | (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                                                            | CO6      | 8 Marks    |
|    |               | basic differences between comparator and Schmitt trigger.                                                                            |          |            |
|    |               | (UNIT-III)                                                                                                                           |          |            |
| 5  | a)            | List out the performance parameters of DAC and describe the operation of                                                             | CO6      | 7 Marks    |
|    | 1 \           | Binary weighted resistors DAC and R/2R ladder DAC.                                                                                   | 005      | 7 ) ( 1    |
|    | D)            | List out the features of 555 timer and derive the expression for frequency                                                           | 005      | / Marks    |
|    |               | with 50% duty cycle                                                                                                                  |          |            |
|    |               | (OR)                                                                                                                                 |          |            |
| 6  | a)            | Indicate the importance of Sample and Hold Circuit. Give the applications                                                            | CO5      | 5 Marks    |
|    | ŕ             | of Sample and Hold Circuit.                                                                                                          |          |            |
|    | 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    |
| 0  | `             | (OR)                                                                                                                                 | 000      | 7 ) ( 1    |
| 8  | a)            | Elaborate the importance of CMOS technology and discuss about CMOS                                                                   | 002      | / Marks    |
|    | <b>b</b> )    | Distinguish Behavioral and structural modelling in Verilog HDI                                                                       | $CO^{2}$ | 7 Marks    |
|    | 0)            |                                                                                                                                      | 002      |            |
| 0  | 2)            | Design 8.1 multipleyer with 4.1 multipleyers and 2.1 multipleyer                                                                     | $CO^{2}$ | 7 Marka    |
| 9  | $\frac{a}{b}$ | Develop Verilog code for 3-bit up counter                                                                                            | CO3      | 7 Marks    |
|    | 0)            | (OR)                                                                                                                                 | 007      | / 10101113 |
| 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    |
|    |               | <u>A</u> A                                                                                                                           |          |            |

CODE No.:16BT41041

Time: 3 hours

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| 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]

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            |
| r  | a)            | $(\mathbf{OK})$<br>What is a DPAM2 Explain the types of DPAM2s with suitable diagrams                     | $CO^{2}$   | 7 Mortes           |
| Ζ  | $\frac{a}{b}$ | Analyze the memory hierarchy in terms of speed size and cost                                              | CO3        | 7 Marks<br>7 Marks |
|    | 0)            |                                                                                                           | 001        | , 1.1.             |
|    |               | 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                                          | CO1        | 7 Marks            |
|    |               | addressing modes.                                                                                         |            |                    |
|    | b)            | Differentiate between software and hardware interrupts.                                                   | CO1        | 7 Marks            |
| c  |               | (OR)                                                                                                      | <b>a a</b> | <b>5</b> ) ( 1     |
| 6  | a)            | Write an 8085 program to arrange an array of data in descending order.                                    | $CO_3$     | 7 Marks            |
|    | 0)            | Distinguish between the memories mapped 1/O and peripheral 1/O.                                           | CO4        | / 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            |
|    |               |                                                                                                           |            |                    |
| 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           |

Time: 3 hours

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]

Max. Marks: 70

# Answer One Question from each Unit

All questions carry equal marks

| U | NI | T-I | ) |
|---|----|-----|---|
|   |    |     |   |

| 1 | a)            | What are asymptotic not suitable examples. | tation  | s? Desc   | ribe t                            | he no       | tations in detail with        | CO1  | 7 Marks    |
|---|---------------|--------------------------------------------|---------|-----------|-----------------------------------|-------------|-------------------------------|------|------------|
|   | b)            | Design an algorithm to f using recursion.  | ind th  | ne soluti | ion foi                           | Tow         | ers of Hanoi problem          | CO3  | 7 Marks    |
|   |               |                                            |         |           | (OR)                              |             |                               |      |            |
| 2 | a)            | Describe performance of complexities.      | algo    | orithms   | with r                            | respect     | t to Time and Space           | CO2  | 7 Marks    |
|   | b)            | Illustrate the specifications              | s in w  | riting al | gorith                            | ms.         |                               | CO1  | 7 Marks    |
|   |               | -                                          |         | ( U       | NIT-I                             | <b>[]</b>   |                               |      |            |
| 3 | a)            | What are Bi-connected co                   | mpon    | ents? Gi  | ive exa                           | mple        |                               | CO1  | 7 Marks    |
| 2 | $\frac{a}{b}$ | Write the algorithms for U                 | Inion   | and Fine  | d                                 | unpre.      |                               | CO2  | 7 Marks    |
|   | 0)            |                                            |         |           | (OR)                              |             |                               | 002  | , 1,101110 |
| 4 | a)            | Describe DFS algorithm w                   | vith su | uitable e | xampl                             | e.          |                               | CO2  | 7 Marks    |
|   | b)            | Describe BFS algorithm w                   | vith su | uitable e | xample                            | e.          |                               | CO2  | 7 Marks    |
|   | ,             | C                                          |         |           | IT-I                              | II          |                               |      |            |
| 5 | a)            | Derive time complexity of                  | f Stras | ssen's m  | atrix n                           | nultipl     | ication                       | CO4  | 4 Marks    |
| • | b)            | Given three objects wi                     | th p    | rofits () | P <sub>1</sub> .P <sub>2</sub> .P | $(25)^{-1}$ | 5.24.15) and weights          | CO1  | 10 Marks   |
|   | -)            | $(W_1, W_2, W_3) = (18, 15, 10), H$        | Finda   | a greedy  | soluti                            | on to       | place the objects in a        |      |            |
|   |               | bag of capacity 20 and ear                 | m max   | ximum r   | orofit.                           | Also v      | vrite the algorithm.          |      |            |
|   |               |                                            |         | . 1       | (OR)                              |             | 8                             |      |            |
| 6 | a)            | Write the control abstraction              | on for  | r divide  | and co                            | nquer       |                               | CO4  | 4 Marks    |
|   | b)            | Sort the following element                 | nts us  | sing me   | rge so                            | rt algo     | orithm. Also write the        | CO4  | 10 Marks   |
|   |               | algorithm with Tree calls                  | repres  | entation  | l.                                | •           |                               |      |            |
|   |               | 41 11 3                                    | 9       | 16        | 2 10                              | 0 14        | 4 8 7                         |      |            |
|   |               |                                            |         |           | NIT-J                             | <b>v</b> )  |                               |      |            |
| 7 | a)            | State <b>n</b> queens problem.             | Solv    | ve the p  | oroblen                           | n usin      | g backtracking. Also          | CO5  | 7 Marks    |
|   | <i>,</i>      | mention the algorithm step                 | os in s | solving t | he pro                            | blem.       | 0                             |      |            |
|   | b)            | Write an algorithm for Op                  | timal   | binary s  | search                            | tree.       |                               | CO5  | 7 Marks    |
|   |               |                                            |         | -         | (OR)                              |             |                               |      |            |
| 8 | a)            | What is dynamic program                    | ming    | ? Explai  | n.                                |             |                               | CO5  | 4 Marks    |
|   | b)            | Solve the following Trave                  | lling   | Salesma   | n Prob                            | lem (       | $\Gamma$ SP) by the method of | CO1, | 10 Marks   |
|   |               | dynamic programming. He                    | ere 1,  | 2, 3, 4   | represe                           | ents di     | fferent cities and each       | CO5  |            |
|   |               | cell value is the distance                 | betwe   | en corre  | espond                            | ling tv     | vo cities. Also explain       |      |            |
|   |               | the procedure of TSP.                      |         |           |                                   |             |                               |      |            |
|   |               |                                            | 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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# (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

|    |    | An 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  |
| 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  |
| 0  | `` | (OR)                                                                                                                                   | 004 | 7 ) ( 1  |
| 8  | a) | Discuss the applet structure and compare it with application structure.                                                                | CO4 | / Marks  |
|    | D) | UNIT-V                                                                                                                                 | 04  | / Marks  |
| 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                                                                 | CO5 | 9 Marks  |
|    | b) | generated. Develop the event nanuler for the Action Event.<br>Explain the procedure to deploy a Servlet in Tomcat Server               | CO5 | 5 Marks  |
|    | U) | Explain the procedure to deploy a Service III Tollical Server.                                                                         | COS | JIVIAIKS |

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SVEC-16

Roll No.

#### **SREE VIDYANIKETHAN ENGINEERING COLLEGE**

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### SOFTWARE ENGINEERING

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

Time: 3 hours

Max. Marks: 70

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

# UNIT-I

| 1 | a) | Explain the spiral model. What is the task region in the spiral model?<br>How does the customer wins by getting the system or product that satisfy<br>the majority of the customer's needs and the developer wins by working<br>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 |
| 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 |
| 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.<br>(OR)                                                                                                                                                                                                           | CO2 | 7 Marks |
| 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.<br>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)<br>b) | Explain in detail about Process Improvement.                     | CO6 | 7 Marks<br>7 Marks |
|----|----------|------------------------------------------------------------------|-----|--------------------|
|    | 0)       | Explain in detail business process reengineering.                | 000 | / Warks            |
|    |          | (OR)                                                             |     |                    |
| 10 | a)       | Propose RMMM plan for Staff inefficiency risk while developing a | CO6 | 7 Marks            |
|    |          | software project.                                                |     |                    |
|    | b)       | What are all the formulas for cyclomatic complexity? Calculate   | CO4 | 7 Marks            |

b) What are all the formulas for cyclomatic complexity? Calculate CO4 7 Marks cyclomatic Complexity for greatest of three numbers.

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

#### **THEORY OF COMPUTATION**

[Information Technology, Computer Science and Systems Engineering]

Time: 3 hours

#### **Answer One Question from each Unit** All questions carry equal marks

# UNIT-I

- 1 a) What are the differences between DFA and NDFA?
  - Let us consider the NDFA shown in the figure below. Find its equivalent CO1 7 Marks b) DFA.





- 2 Define the closure properties of NFA. a)
  - Conversion from Mealy to Moore Machine for the following table. **b**)

|                       | Input = 0             |        | Input =        | = 1    |  |  |  |
|-----------------------|-----------------------|--------|----------------|--------|--|--|--|
| Present State         | Next State            | Output | Next State     | Output |  |  |  |
| qo                    | <b>q</b> <sub>1</sub> | 0      | q <sub>2</sub> | 0      |  |  |  |
| $q_1$                 | <b>q</b> <sub>1</sub> | 0      | q <sub>2</sub> | 1      |  |  |  |
| <b>q</b> <sub>2</sub> | <b>q</b> <sub>1</sub> | 1      | q <sub>2</sub> | 0      |  |  |  |
|                       |                       |        |                |        |  |  |  |

# (UNIT-II)

3 State and explain DFA Minimization using Myphill-Nerode theorem with CO2 7 Marks a) the following example



Explain the properties of Regular Sets. **b**)



Prove that  $\mathbf{L} = \{\mathbf{a}^i \mathbf{b}^i \mid i \ge 0\}$  is not regular. 4 a)

b)



CO2

CO2 7 Marks CO<sub>2</sub> 7 Marks

7 Marks

- CO1 7 Marks
- CO2 7 Marks

Max. Marks: 70

7 Marks

CO1

# (UNIT-III)

| 5  | a)       | Define context-free grammar. Explain with example.                                                                           | CO3 | 7 Marks |
|----|----------|------------------------------------------------------------------------------------------------------------------------------|-----|---------|
|    | b)       | Remove unit production from the following.                                                                                   | CO3 | 7 Marks |
|    | <i>.</i> | $S \rightarrow XY, X \rightarrow a, Y \rightarrow Z \mid b, Z \rightarrow M, M \rightarrow N, N \rightarrow a$               |     |         |
|    |          | (OR)                                                                                                                         |     |         |
| 6  | a)       | Find out whether the language $\mathbf{L} = \{\mathbf{x}^n \mathbf{y}^n \mathbf{z}^n \mid n \ge 1\}$ is context free or not. | CO3 | 7 Marks |
|    |          | Using Pumping lemma theorem.                                                                                                 |     |         |
|    | b)       | Convert the following CFG into CNF                                                                                           | CO3 | 7 Marks |
|    |          | $S \rightarrow XY \mid Xn \mid p  X \rightarrow mX \mid m  Y \rightarrow Xn \mid o$                                          |     |         |
|    |          | UNIT-IV                                                                                                                      |     |         |
| 7  | a)       | Explain the basic structure of PDA.                                                                                          | CO4 | 7 Marks |
|    | b)       | Construct a PDA that accepts $\mathbf{L} = \{0^n \ 1^n \mid n \ge 0\}$                                                       | 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 " <b>x</b> + <b>y</b> * <b>z</b> " for the grammar G                             | CO4 | 7 Marks |
|    |          | with the following production rules.                                                                                         |     |         |
|    |          | $P: S \to S+X \mid X, X \to X*Y \mid Y, Y \to (S) \mid id$                                                                   |     |         |
|    |          |                                                                                                                              |     |         |
| 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 $\alpha$ '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 |
|    |          |                                                                                                                              |     |         |

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Time: 3 hours

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### SREE VIDYANIKETHAN ENGINEERING COLLEGE

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

# CONTROL SYSTEMS

#### [Electronics and Instrumentation Engineering]

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 CO4 7 Marks V(t) and output is current through the inductor.



2 For the mechanical system, draw the electrical analogous circuits based on CO4 14 Marks Torque-Voltage and Torque-Current analogy along their equations.



# UNIT-II

- The transfer function of a unity feedback system CO2 14 Marks  $G(S)H(S) = \frac{k}{s(s+2)(s+4)}$ . Sketch the root locus and determine:
  - i) The value of k to have 40 % overshoot for unit step input.
  - ii) Value of K<sub>v</sub> corresponding to value of K as obtained in (i).
  - iii) Value of settling time t<sub>s</sub>.

#### (OR)

4 Determine the resonant frequency  $W_r$ , resonant peak  $M_r$ , time to reach CO4 14 Marks first overshoot, settling time and band width for the system whose transfer

function is given by 
$$\frac{C(s)}{R(s)} = \frac{5}{S^2 + 2S + 5}$$
.

5 A unity feedback system has an open loop transfer function CO5 14 Marks  $G(S) = \frac{60}{(S+1)(S+2)(S+5)}$ Sketch Nyquist plot for the system and determine whether the closed loop system is stable or not.

(OR)

Sketch the bode plot for system  $G(S)H(S) = \frac{5(1+2S)}{(1+4S)(1+0.25S)}$  and CO5 14 Marks comment on its stability.

- 7 a) What are the types of controllers? Mention the effect of P, PID on CO1 7 Marks controllers.
  - 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 CO3 14 Marks  $G(S) = \frac{4}{S(2S+1)}$ . It is desired to obtain a phase margin of 40° without sacrificing the K<sub>v</sub> of the system. Design a suitable lag-network and compute the value of network components assuming any suitable impedance level.

# UNIT-V

9 a) Explain the concept of controllability and observability.
b) The transfer function of a control system is given by CO2 7 Marks
V(s) S+2

 $\frac{Y(s)}{U(s)} = \frac{S+2}{S^3+9S^2+26S+24}$ . Check for controllability and observability.

#### (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.

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iii) Solve the state equation for the unit step input under zero initial conditions.

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# 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

Answer One Question from each Unit All questions carry equal marks

# UNIT-I

| 1  | a)<br>b) | What are the objectives and guiding principles of environmental studies?<br>Analyze the various types of land degradation with its causes and solutions.                                           | CO1<br>CO2 | 7 Marks<br>7 Marks  |
|----|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------------|
| _  |          | (OR)                                                                                                                                                                                               |            |                     |
| 2  | a)<br>b) | Analyze the environmental impact of deforestation.<br>What are the world's food problems and what can we do help solve the<br>world's food problems?                                               | CO2<br>CO3 | 7 Marks<br>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? (OR)                                                                                                                    | CO1        | 7 Marks             |
| 4  |          | Analysis an aquarium as an eco system. Identify the major abiotic and<br>biotic factors. List the members of the producer, primary consumer,<br>secondary consumer and decomposer tropic levels.   | CO2        | 14 Marks            |
|    |          | (UNIT-III)                                                                                                                                                                                         |            |                     |
| 5  | a)       | List the five primary and secondary air pollutants and commonly released<br>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.<br>(OR)                                                                                                                                | CO9        | 14 Marks            |
| 8  | a)<br>b) | How the problems can be solved related to global warming?<br>Discuss the constitution, duties and powers the wild life advisory board<br>under the provisions of the wild life protection Act 1972 | CO4<br>CO8 | 4 Marks<br>10 Marks |
|    |          |                                                                                                                                                                                                    |            |                     |
| 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.<br>(OR)                                                                                                                                | CO1        | 7 Marks             |
| 10 |          | Write a report based on the visit in an industrial area.                                                                                                                                           | CO9        | 14 Marks            |

Max. Marks: 70

Time: 3 hours

# SREE VIDYANIKETHAN ENGINEERING COLLEGE

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

# ELECTRONIC CIRCUIT ANALYSIS AND DESIGN

[Electronics and Instrumentation Engineering]

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 $\pi$ 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                                                                                           | CO4 | 6 Marks  |
|   |    | $f_{\beta} = 200 \text{kHz}$ , calculate:                                                                                                                             |     |          |
|   |    | i) $\mathbf{f}_{\mathbf{T}}$ ii) hfe.                                                                                                                                 |     |          |
|   |    | iii)  Ai  at a frequency of10MHz.                                                                                                                                     |     |          |
|   |    | iv)  Ai  at a frequency of 100MHz.                                                                                                                                    |     |          |
|   |    | (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<br>applied. When negative feedback is applied, the nominal gain changes by                        | CO4 | 5 Marks  |
|   |    | 10%. Find the percentage change in the overall gain.                                                                                                                  |     |          |
|   |    | (OR)                                                                                                                                                                  |     |          |
| 6 | a) | Derive the expression for frequency of oscillations and the minimum gain<br>required for sustained oscillations of the RC phase shift oscillator with<br>neat diagram | CO3 | 10 Marks |
|   | b) | An Hartlay oscillator is designed with $L_{z}=20\mu H_{z}L_{z}=02mH$ and a variable                                                                                   | CO4 | 4 Marks  |
|   | 0) | capacitance. Determine the range of capacitance value, if the frequency is varied between 950 to 2050kHz                                                              |     |          |
|   |    | (UNIT-IV)                                                                                                                                                             |     |          |
| 7 | a) | Analyze the working of series fed class A power amplifier and derive the                                                                                              | CO6 | 10 Marks |
| , | u) | equation for efficiency.                                                                                                                                              | 000 | 10 maine |
|   | b) | For transformer, the load connected to the secondary has an impedance of                                                                                              | CO4 | 4 Marks  |
|   |    | $8\Omega$ . Its reflected impedance on primary is observed to be $648\Omega$ . Calculate the turn ratio.                                                              |     |          |
|   |    | (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 Marksb) The bandwidth for double tuned amplifier is 10kHz. Calculate the CO5 6 Marks
  - b) The bandwidth for double tuned amplifier is TokHZ. Calculate the COS 6 Marks bandwidth if such three stages are cascaded.

#### (OR)

10 Explain the frequency response of stagger pair and derive the expression CO5 14 Marks for the gain of stagger tuned amplifier.

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#### 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 Define and sketch the following elementary continuous time signals. a) CO3 7 Marks i) Unit impulse signal. ii) Exponential. iii) unit step function. Check the system  $y(t) = \cos[x(t)]$  is linear, Time invariant and stable. b) CO4 7 Marks (**OR**) 2 Define the following properties for a continuous time system. CO3 7 Marks a) i) Causal or non causal. ii) Time variant or time invariant. iii) Linear or non linear. iv) Stable or unstable. Test whether the signal is periodic or Not. If so find the fundamental CO4 7 Marks b) i)  $x(t) = e^{j \cdot 10t}$ Period ii)  $x(t) = \cos(\pi/3t) + \sin(\pi/5t)$ . UNIT-II ) 3 Explain about complex Fourier spectrum. CO3 7 Marks a) Find the Fourier transform of x(t) = u(2t), where u(t) is the unit step b) CO2 7 Marks function. (**OR**) 4 State any four properties of Fourier series. CO2 7 Marks a) Define Fourier transform. Explain the properties of Fourier transform. CO3 7 Marks b) (UNIT-III) 5 State and prove any four properties of Auto correlation function. CO2 7 Marks a) Determine the autocorrelation function and energy spectral density CO1 7 Marks b) function of  $x(t) = e^{-at} u(t)$ . (**OR**) Explain briefly detection of periodic signals in the presence of noise by 6 a) CO2 7 Marks correlation. Analyze the conditions required by the real time communication system in b) CO3 7 Marks order to have distortion less transmission. UNIT-IV Find the Laplace transform of the following signals. 7 CO<sub>2</sub> 7 Marks a) i) Impulse function. ii) unit step function. iii) A sin  $(w_0 t) u(t)$ . Explain how Laplace transform is useful to analyze the stability of system b) CO1 7 Marks in S domain. (**OR**) Prove the scaling and time shifting properties of Laplace transform. 8 CO4 7 Marks a) Determine the Laplace transform of  $x(t) = e^{-at} \operatorname{Cos}(wt) u(t)$ . CO1 7 Marks b) UNIT-V 9 State and prove the following properties of Z transform. a) CO1 7 Marks ii) Time shifting. iii) Differentiation. i) Linearity. b) What is aliasing? Explain its effect on sampling. CO2 7 Marks  $(\mathbf{OR})$ Derive the relation between Z transform and Fourier transform. 10 CO3 7 Marks a) Using appropriate method find y(n) of the Z transformed signal Y(Z)=Z/7 Marks b) CO1  $(Z-1)^2$ . R

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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

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.                                           | CO1 | 8 Marks      |
|---|------------|--------------------------------------------------------------------------------------------------------------------------------------|-----|--------------|
|   | b)         | 1) $14/2 = 5$ . 11) $54/4 = 13$ . 111) $24 + 17 = 40$ . 1V) $378 = 275$ .                                                            | CO1 | 6 Marka      |
|   | 0)         | 2's complement method.                                                                                                               | COI | 0 WIAIKS     |
|   |            | i) 10011 – 10001. ii) 1001 – 101000.                                                                                                 |     |              |
|   |            | (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.                                                                      | CO4 | 8 Marks      |
|   |            | (i) 1110111. (ii) 0111101.                                                                                                           |     |              |
|   |            | UNIT-II)                                                                                                                             |     |              |
| 3 | a)         | Simplify the Boolean functions. using four-variable maps:                                                                            | CO1 | 8 Marks      |
|   |            | $F(A, B, C, D) = \Sigma (0, 2, 4, 5, 6, 7, 8, 10, 13, 15).$                                                                          |     |              |
|   | b)         | Draw a NAND logic diagram that implements the complement of the $\Gamma$                                                             | CO1 | 6 Marks      |
|   |            | function: $F(A, B, C, D) = \Sigma(0, 1, 2, 3, 4, 8, 9, 12)$                                                                          |     |              |
| 4 |            | Using tabulation method simplify the                                                                                                 | CO1 | 14 Marks     |
| • |            | $F(A, B, C, D) = \Sigma m(1, 3, 8, 10, 15) + \Sigma d(0, 2, 9).$                                                                     | 001 | 1 T TOTALING |
|   |            |                                                                                                                                      |     |              |
| 5 | a)         | Design a combinational circuit with three inputs and one output                                                                      | CO3 | 9 Marks      |
| 5 | a)         | i) The output is 1 when the binary value of the inputs is less than 3.                                                               | COJ | ) what is    |
|   |            | The output is 0 otherwise.                                                                                                           |     |              |
|   |            | ii) The output is 1 when the binary value of theinputs is an even number.                                                            |     |              |
|   | 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.<br>$V = \Sigma(0, 1, 2, (-7)) = V = \Sigma(0, 2, 4, 7) = V = \Sigma(1, 2, (-7))$ | CO3 | 6 Marks      |
|   |            | $Y_1 = \Sigma(0, 1, 3, 6, 7),  Y_2 = \Sigma(0, 2, 4, 7),  Y_3 = \Sigma(1, 3, 6, 7).$                                                 |     |              |
|   |            | UNIT-IV                                                                                                                              |     |              |
| 7 | a)         | What is difference between latch and flip flop? Explain about clocked RS                                                             | CO1 | 6 Marks      |
|   | <b>b</b> ) | flip-flop using NAND gates.                                                                                                          | cor | 9 Martia     |
|   | D)         | Convert D hip-hop into T and JK hip-hops.                                                                                            | 02  | 8 Marks      |
| 8 | a)         | Draw the schematic circuit of JK master slave flip-flop. Give its truth table                                                        | CO1 | 8 Marks      |
|   | ,          | and justify the entries in the truth table.                                                                                          |     | ~            |
|   | b)         | What are the different types of registers? Explain the Serial Input Parallel                                                         | CO6 | 6 Marks      |

SVEC-16

Max. Marks: 70

Output shift register.

#### UNIT-V

9 a) Explain operation of Johnson counter with a diagram.
 b) Explain the operation of universal shift register with suitable examples.
 (OR)
 CO2 4 Marks CO1 10 Marks

10 A sequential circuit with two D flip-flops A and B, two inputs, x and y; CO5 14 Marks 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.

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Time: 3 hours

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### CONCRETE TECHNOLOGY [Civil Engineering]

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 CO1 14 Marks and influences on the properties of Fresh and Hardened concretes and Durability of concretes?

#### (**OR**)

2 Write different classifications aggregates and explain the influences of CO1 14 Marks size, shape, texture and grading on the properties of Fresh and Hardened concretes and Durability of concretes.

#### UNIT-II)

3 Explain what is the workability of concrete and its influences on the CO2 14 Marks properties of Fresh and Hardened concretes and Durability of concretes.

#### (**OR**)

- 4 Explain about the following properties of hardened concrete and the CO2 14 Marks procedure to measure these properties:
  - i) Compressive strength.
  - ii) Tensile strength.
  - iii) Flexural strength.
  - iv) Maturity Concept of the concrete.

#### (UNIT-III)

- 5 a) Explain in detail how the Creep and the Drying Shrinkage will affect the CO1 10 Marks performance of the concrete.
  - 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 CO5 14 Marks due to the corrosion of reinforcing steel.

### UNIT-IV

7 Explain in detail about ACI methodology of Concrete Mix Design. CO3 14 Marks

(OR)

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| 8  | Design a concrete mix for M35 grad<br>concreting, using rounded aggregat<br>the mix design is as given below:                                                   | de for fly ash concrete for the pumped<br>e and using IS method. The data for | 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 <sup>3</sup>                                                         |     |          |
|    | 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<br>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  | <ul> <li>Write short notes on following items</li> <li>i) Mass Concreting.</li> <li>ii) Ready Mixed Concreting</li> <li>iii) Under Water Concreting.</li> </ul> | 5:<br>;.                                                                      | CO1 | 14 Marks |
| 10 |                                                                                                                                                                 | (UK)                                                                          | 001 | 1434 1   |
| 10 | Write short notes on following items                                                                                                                            | S:                                                                            | COI | 14 Marks |
|    | 1) Koller Compacted Concr                                                                                                                                       | eting.                                                                        |     |          |
|    | 11) Pumped Concreting.                                                                                                                                          |                                                                               |     |          |
|    | iii) Sprayed Concreting (Sho                                                                                                                                    | ot-Creeting).                                                                 |     |          |
|    |                                                                                                                                                                 |                                                                               |     |          |

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(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

Give a brief about scope of geology in civil engineering. CO1 14 Marks (OR)
 List the types of weathering. Give a brief about Chemical weathering of CO1 14 Marks rocks. What is the significance of weathering of rocks in civil engineering?

### 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 CO2 14 Marks characteristic features? How do you distinguish major rock types in the field?

### 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 |
|   |    |                                                          |     |         |

6 Give a brief about sub surface investigation using electrical resistivity CO4 14 Marks method. What are the applications of electrical resistivity method in civil engineering?

### UNIT-IV

| 7 |    | What do you understand about hydrological properties of rocks and | CO6 | 14 Marks |
|---|----|-------------------------------------------------------------------|-----|----------|
|   |    | highlight on measures to improve groundwater resources?           |     |          |
|   |    | (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 CO3 14 Marks for construction of dam and reservoir. (OR)

- 10 a) Present any case study of a dam how ignorance of geological factors lead CO7 7 Marks to failure of dams.
  - b) Give a brief about geological considerations in site selection for a bridge. CO3 7 Marks

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

#### ENGINEERING HYDROLOGY [Civil Engineering]

Time: 3 hours

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Max. Marks: 70

CO3

7 Marks

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

### UNIT-I

The isohyets drawn for a storm which occurred over a drainage basin of CO2 14 Marks area 950 sq.km yielded the following information. Determine the average depth of rainfall over the basin.

| Isohyetal interval in mm           | 85-75 | 75-65 | 65-55 | 55-45 | 45-35 |  |  |  |
|------------------------------------|-------|-------|-------|-------|-------|--|--|--|
| Area between<br>isohyetes in sq.km | 125   | 236   | 264   | 175   | 150   |  |  |  |
|                                    |       |       |       |       |       |  |  |  |

#### (OR)

2 The average annual rainfalls in cm at 4 existing raingauge stations in a CO2 14 Marks 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.

### UNIT-II)

List infiltration indices and In a 140 min storm the following rates of CO2 14 Marks 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.

#### (OR)

- 4 a) Differentiate between evaporation and Evapotranspiration. What are the CO1 7 Marks various factors affecting Evapotranspiration?
  - b) Describe interception and draw typical interception loss curve with a neat CO1 7 Marks sketch.

### (UNIT-III)

5 During a recuperation test conducted on an open well in a region, the CO4 14 Marks 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.

#### (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.
  - b) Describe the most commonly used two techniques for routing of floods CO5 7 Marks through reservoir.

#### (OR)

8 Route the following flood hydrograph through a river reach for which CO4 14 Marks K=12.0 hr, and x=0.20. At the start of the inflow flood, the outflow discharge is 10 cumec.

| Time(hr)       | 0  | 6  | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 |
|----------------|----|----|----|----|----|----|----|----|----|----|
| Inflow (cumec) | 10 | 20 | 50 | 60 | 55 | 45 | 35 | 27 | 20 | 15 |

|          |          | <u> </u> |
|----------|----------|----------|
| (        | LINITT V | - 1      |
| <u>ا</u> | UNITI-V  |          |
| $\sim$   |          | ~        |

- 9 Discuss erosion and reservoir sedimentation problems in India. (OR) CO6 14 Marks 10 Discuss about reservoir sedimentation control. CO7 14 Marks

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Time: 3 hours

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

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

# STRUCTURAL ANALYSIS - I

### [Civil Engineering]

Max. Marks: 70

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

### UNIT-I

A point with in a loaded beam in under a bending stress of 35Mpa CO1 14 Marks (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.

#### (OR)

2 The stresses on two perpendicular planes through a point in a body are CO1 14 Marks 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

### UNIT-II)

3 Derive expression to find out the equations for slope and deflection of a CO1 14 Marks simply supported beam of length L and uniform EI with a central point load P. evaluate its maximum slope and deflection.

#### (**OR**)

- 4 a) Using moment area theorem, find the maximum deflection in the simply CO3 7 Marks supported beam carrying uniformly distributed load of intensity w per metre length
  - b) A cantilever AB of span 6m is fixe at the end A and propped at end B. It CO2 7 Marks 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.

### UNIT-III)

5 a) Mention the assumptions and limitations of the Euler's formula.
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<sup>2</sup> and tensile stress of 25N/mm<sup>2</sup>, 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?

#### (OR)

6 A hollow cost iron column with fixed ends supports an axial load of CO3 14 Marks 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  $80N/mm^2$ .

SVEC-16

### UNIT-IV)

CO4

7 Marks

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



b) A beam AB of span 5m fixed at both ends carries a uniformly distributed CO4 7 Marks 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<sup>2</sup> and  $I = 7.5 \times 10^7$ mm<sup>4</sup>. Find the Fixed end moments for the given beam, support A sinks by 2mm and support B sinks by 3mm.  $E = 2 \times 10^5$ N/mm<sup>2</sup>, I = 40000cm<sup>4</sup>.

(OR)

Analyze the given continuous beam by Clapreyon's theorem of three CO4 14 Marks moments also draw shear force and bending moment diagrams.



### UNIT-V

- A bolt is subjected to an axial pull of 12kN together with a transverse CO2 14 Marks shear force of 6kN. Determine the required diameter of the bolt by using:
  - i) Maximum principal stress theory.
  - ii) Maximum Strain theory.
  - iii) Maximum shear stress theory.

Use the following data:

elastic limit in tension= 300 N/mm<sup>2</sup>, factor of safety = 3 and poisons ratio = 0.3

#### (OR)

A cylindrical shaft made of steel of yield strength 350MPa is subjected to CO1 14 Marks static load consisting of bending moment of 10kN.m and a torsional moment of 30kN.m. Determine the shaft using:

- 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.

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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 Ouestion 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 CO<sub>2</sub> 10 Marks source for a water supply scheme. How does the quality of ground water differ from surface water?
  - Find the alkalinity if the water sample is having  $CO_3^{-2}$  ions of 90 mg/L CO1 b) 4 Marks and  $HCO_3^{-1}$  of 61 mg/L.

#### (**OR**)

2 Classify the different types of springs. a)

water as per IS 10500:2012.

- b) Explain how water is drawn from infiltration galleries with a neat sketch. CO1 7 Marks UNIT-II)
- 3 Draw a neat sketch of canal intake and explain the working principle. CO1 4 Marks a) State its merit and demerits.
  - The population of a town as per past census records are furnished below. b) CO<sub>2</sub> 10 Marks Predict the population in the year 2031 and 2041 using the Geometrical increase method.

| Census Year | 1941  | 1951  | 1961  | 1971  | 1981  | 1991  | 2001  | 2011   |
|-------------|-------|-------|-------|-------|-------|-------|-------|--------|
| Population  | 44642 | 50487 | 56816 | 63859 | 71458 | 78543 | 88131 | 100290 |

#### (**OR**)

Explain the working principle of a reservoir intake with a neat sketch. 4 CO1 7 Marks a) Recommend desirable and permissible quality standards for drinking CO7 7 Marks b)

- UNIT-III)
- Explain working of rapid sand filter with the help of neat sketch. 5 CO1 7 Marks a) Estimate the settling velocity of a particle of 0.06mm diameter having 7 Marks b) CO2 specific gravity of 2.65 in temperature of 20°C. The kinematic viscosity of  $\gamma = 1.007 \times 10^{-6} \text{ m}^2/\text{ sec.}$

#### (**OR**)

Explain the sedimentation by coagulation process using alum and state the 6 CO5 7 Marks a) merits and demerits of using alum. Design a slow sand filer for a town of population 60000 persons, provided b) CO3 7 Marks water supply rate 160Lpcd. Take filtration rate as 2.5 litres per minute, m<sup>2</sup>, L/B ratio as 2, maximum demand as 1.8 times average demand.

### UNIT-IV

7 What are the effects of excess concentration of Fluoride in water? List the a) CO6 7 Marks methods available for defluoridation and explain any one of them. Write short notes on types of valves. CO6 7 Marks b) (**OR**) Discuss about the Ion exchange method of water softening with a sketch. 7 Marks 8 a) CO4 Describe the types of hardness present in water. 7 Marks b) CO1 UNIT-V 9 Explain the methods of detection of leakage in the distribution pipes. CO<sub>5</sub> 14 Marks (**OR**) Briefly discuss the design principles involved the design of water supply 10 CO6 14 Marks

network to be laid in a multi storied buildings.

CO1 7 Marks

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

### ELECTRICAL MEASUREMENTS

[Electrical and Electronics Engineering]

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                                                                                                                                 | CO4   | 7 Marks |
|   |    | 15mm x 12mm. The flux density In the air gap is $1.8 \times 10^{-a}$ Wb/m <sup>2</sup> and                                                                                                         |       |         |
|   |    | the spring constant is $0.14 \times 10^{-6}$ Nm/rad. Determine the number of turns required to produce an angular deflection of 90 <sup>6</sup> when a current of 5 mA is flowing through the soil |       |         |
|   |    | UNIT-II                                                                                                                                                                                            |       |         |
| 3 | a) | Explain the function of a current transformer. How does a current                                                                                                                                  | CO2   | 7 Marks |
|   | ,  | transformer differ from an ordinary power transformer?                                                                                                                                             |       |         |
|   | b) | List the various parameters that affect the characteristics of current                                                                                                                             | CO4   | 7 Marks |
|   |    | transformer.                                                                                                                                                                                       |       |         |
|   | `  | (OR)                                                                                                                                                                                               | 004   |         |
| 4 | a) | A current transformer has a single turn primary and a 200 turns secondary winding. The secondary supplies a surrent of 5 A to a non-inductive                                                      | CO4   | / Marks |
|   |    | burden of 10 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                                                                                                                            |       |         |
|   |    | $1000 \text{ mm}^2$ .                                                                                                                                                                              |       |         |
|   | b) | Why secondary of current transformer should never be open when the                                                                                                                                 | CO4   | 7 Marks |
|   | ,  | Primary winding is energized?                                                                                                                                                                      |       |         |
|   |    | UNIT-III                                                                                                                                                                                           |       |         |
| 5 | a) | Draw a neat sketch and explain the operation of a single phase induction                                                                                                                           | CO1   | 7 Marks |
|   | h) | In a dynamometer wattmeter the moving coil has 500 turns of mean                                                                                                                                   | CO4   | 7 Marks |
|   | 0) | diameter 30 mm. Estimate the torque if the axes of the field and moving                                                                                                                            | 001   | / Winns |
|   |    | coils are at (i) 60° (ii) 90° when the density in the field coils is $15 \times 10^{-3}$                                                                                                           |       |         |
|   |    | $Wb/m^2$ , the current in moving coil is 0'05 Å and the power factor is 0.866.                                                                                                                     |       |         |
|   |    | (OR)                                                                                                                                                                                               |       |         |
| 6 | a) | Explain the working of Low power factor Electrodynamometer type                                                                                                                                    | CO5   | 7 Marks |
|   |    | wattmeter with a neat diagram.                                                                                                                                                                     | ~ ~ . |         |
|   | b) | A 230V, single phase, watt hour meter has a constant lead of 4 A passing                                                                                                                           | CO4   | 7 Marks |
|   |    | 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 $kWh^2$ 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.                                                                                                                                                                                       |       |         |

Time: 3 hours

#### UNIT-IV) 7 What are the different difficulties encountered in the measurement of high CO3 7 Marks a) resistances? Explain how these difficulties are overcome. b) In the Wheatstone bridge, the values of resistances of various arms are CO5 7 Marks $P = 1000\Omega$ , $Q = 100\Omega$ , $R = 2,005\Omega$ and $S = 200\Omega$ . The battery has an emf of 5V and negligible internal resistance. The galvanometer has a current sensitivity of $10 \text{mm}/\mu\text{A}$ and an internal resistance of $100\Omega$ . Calculate the deflection of galvanometer and the sensitivity of the bridge in terms of deflection per unit change in resistance. (**OR**) 8 List the advantages and disadvantages of Desauty's Bridge. CO1 5 Marks a) A bridge consists of the following : CO3 9 Marks b) Arm ab - a choke coil having a resistance R<sub>1</sub> and inductance L<sub>1</sub>. Arm bc - a non-inductive resistance R<sub>3</sub>. Arm cd - a mica condenser C<sub>4</sub> in series with a non-inductive resistance R<sub>4</sub>. Arm da - a non-inductive resistance R<sub>2</sub> when this bridge is fed from a source of 500 Hz, balance is obtained under following conditions: $R_2 = 2410\Omega$ ; $R_3 = 750\Omega$ ; $C_4 = 0.35\mu$ F, $R_4 = 64.5\Omega$ . The series resistance of capacitor is = $0.4\Omega$ . 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**. UNIT-V 9 A simple slide wire is used for measurement of current in a circuit. The CO<sub>4</sub> 7 Marks a) voltage drop across a standard resistor of $0.1\Omega$ is balanced at 75cm. Find the magnitude of current if the standard cell emf of 1.45V is balanced at 50cm. Explain the operation of DC crompton potentiometer with a neat diagram. b) CO1 7 Marks **(OR)** 10 Explain how lissajous figures can be used in frequency measurement. CO1 7 Marks a) b) Explain about each block of digital voltmeter and mention its advantages. CO1 7 Marks

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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 Explain the growth in Electrical power sector in India. CO7 7 Marks a) List out the site selection factor for hydroelectric power station and CO5 7 Marks b) thermal power plant. (**OR**) Draw the water circuit in a thermal power plant. Explain the state of water 2 7 Marks a) CO1 in each stage. Compare impulse and reaction turbines CO<sub>2</sub> 7 Marks b) UNIT-II ) 3 Classify the nuclear reactors based on fossil fuels, moderators and control CO1 7 Marks a) rods used. Explain them briefly. Explain Breeder reactor with neat diagram. Also list out its advantages b) CO1 7 Marks and limitations. (**OR**) 4 Discuss the advantages and disadvantages of Diesel power plant. Also CO2 7 Marks a) mention the reason for not using diesel power plants for generating bulk powers. Draw the layout of gas turbine power plant and briefly explain the b) CO<sub>2</sub> 7 Marks function of various components. UNIT-III) 5 i) Explain the factors affecting the performance of PV Cell. CO6 6 Marks a) ii) Mention advantages and disadvantages of PV Cell. Explain the classification of wind turbines based on orientation with neat b) CO8 8 Marks sketches. (**OR**) Explain anaerobic digestion for biogas with neat sketch. CO6 7 Marks 6 a) Briefly describe on microgrid. Mention its significance. CO8 7 Marks b) (UNIT-IV) 7 A generating station has the following daily load cycle. CO2 8 Marks a) Time (Hours) 0-6 6–10 10-12 12-16 16-20 20 - 24Load (MW) 20 25 30 25 20 35 Draw the load curve and load duration curve. Determine: i) Maximum demand. ii) Units generated per day. iv) Load factor. iii) Average load and. Explain Diminishing Value method to determine the depreciation cost of CO4 b) 6 Marks the power plant.

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CO2 7 Marks

8 A generating station has the following daily loads: a)

| 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. Determine the cost of generation per kW-hr from the following data.

|    | 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 / kŴ-hr.                        |     |         |
|    |    | Fuel cost -                             | Rs. 40 tone                            |     |         |
|    |    | Salaries, wages, repairs and            |                                        |     |         |
|    |    | maintenance -                           | 6,00,000 / year.                       |     |         |
|    |    | The maximum demand is 80 MW ar          | nd load factor is 40%.                 |     |         |
|    |    |                                         | UNIT-V                                 |     |         |
| 9  | a) | Explain the various operation mod       | es of cogeneration systems with neat   | CO6 | 7 Marks |
|    | ,  | block diagrams.                         |                                        |     |         |
|    | 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 | CO8 | 6 Marks |
|    |    | practical constraints to install cogene | eration plant.                         |     |         |
|    | b) | Explain the series and shunt com        | nection of capacitors with necessary   | CO3 | 8 Marks |
|    |    | equations and phasor diagrams.          |                                        |     |         |

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(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

3

4

Max. Marks: 70

#### **Answer One Question from each Unit** All questions carry equal marks

### UNIT-I

1 Compare between core type and shell type transformers. CO1 6 Marks a) Derive the EMF equation of a 1-phase transformer and calculate the emf / b) CO<sub>2</sub> 8 Marks turn, if the flux is 0.015 Wb at a frequency of 50 Hz. (**OR**) 2 a) Develop the equivalent circuit of a single-phase transformer. CO1 6 Marks A 200 kVA, 1- phase, 3300 / 400 V transformer gave the following results CO4 8 Marks b) 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.

UNIT-II

| a)       | Explain the O.C. and S.C. tests on the transformer and hence explain the | CO1 | 9 Marks |
|----------|--------------------------------------------------------------------------|-----|---------|
|          | evolution of equivalent circuit from it.                                 |     |         |
| b)       | Explain the autotransformer with neat diagram.                           | CO4 | 5 Marks |
|          | (OR)                                                                     |     |         |
| a)       | With neat phasor diagram, explain the voltage regulation of three-phase  | CO1 | 8 Marks |
| <i>,</i> | transformer.                                                             |     |         |

b) The maximum efficiency of a 500kVA. 3,300 V/500 V, 50Hz single phase CO4 6 Marks transformer is 97% and occurs at <sup>3</sup>/<sub>4</sub> full load, unity power factor. If the impedance is 10%, calculate the regulation at full load, power factor 0.8 lagging.

### UNIT-III

- 5 Determine the following impedance parameters of a 3-phase transformer CO1 6 Marks a) ii) Z<sub>s</sub>, iii) Z<sub>t</sub> i) Z<sub>p</sub>,
  - A 5000 KVA, 3-Phase transformer 6.6/33 KV,  $\Delta$ /Y, has no load loss of CO3 8 Marks b) 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.

#### (**OR**)

6 Explain about 3- Phase transformation. CO1 5 Marks a) A 3-Phase step-down transformer is connected to 7.8 KV mains and takes 9 Marks b) CO4 12A. Calculate the secondary line voltage, line current and output for the following connections.

i)  $\Delta/\Delta$ ii) Y/Y iii)  $Y/\Delta$ The ratio of turns per phase is 15. Neglect losses.

### UNIT-IV

- 7 Describe briefly the working principle of slip ring induction motor. CO1 9 Marks a) Explain how its speed control is effected. 5 Marks
  - Explain about torque-slip characteristics. CO2 b)

#### (**OR**)

- 8 Draw and explain the equivalent circuit of Induction Motor with the help CO1 8 Marks a) of phasor diagram.
  - A 3-phase, 50Hz induction motor has a full-load speed of 960rpm. CO4 6 Marks b) Calculate i) no. of poles; ii) slip frequency; iii) speed of rotor field w.r.t rotor structure, stator structure and stator field.

### UNIT-V

9 Explain about No-load and blocked rotor tests. CO1 6 Marks a) A 25KW, 415V, 8-pole, delta connected squirrel cage induction motor CO4 8 Marks b) 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  $0.6\Omega$ . Calculate the additional losses and equivalent circuit parameters.

#### (**OR**)

- Explain about the speed control of induction motor by cascade operation. 10 a) CO1 7 Marks Explain the following: CO2 7 Marks b)
  - i) Crawling ii) Cogging.

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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

#### DESIGN OF MACHINE ELEMENTS-I [Mechanical Engineering]

Max. Marks: 70

8 Marks

6 Marks

8 Marks

CO1

#### 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? CO1 6 Marks Explain.

#### (OR)

- 2 a) What are the different theories of failure? Explain briefly.
  - b) An unknown weight falls through 10 mm on a collar rigidly attached to CO2 6 Marks the lower end of a vertical bar 3m long and  $600 \text{mm}^2$  in cross section. If the maximum instantaneous extension is known to be 2mm, determine the corresponding stress and the value of unknown weight. Take  $E = 200 \text{kN/mm}^2$ .

### UNIT-II)

3 A cantilever beam made of cold drawn steel 40C8 ( $\sigma_{ut} = 600$ N/mm<sup>2</sup> and CO4 14 Marks  $\sigma_{yt} = 380$ N/mm<sup>2</sup>) 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.



#### (OR)

- 4 a) What is stress concentration? How does it affect the fatigue strength? CO1
  - b) A machine member is made of plain carbon steel of ultimate strength CO2 650N/mm<sup>2</sup> and endurance limit of 300N/mm<sup>2</sup>. 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.

### (UNIT-III)

- 5 a) What is bolt of uniform strength? Explain the two methods to make a bolt CO1 6 Marks of uniform strength.
  - b) Explain the method of determining the size of the bolt when the bracket CO3 8 Marks carries an eccentric load perpendicular to the axis of the bolts.

#### (**OR**)

# DE

- 6 With neat sketches, explain different types of welded joints. a)
  - A steel plate 100mm wide and 10mm thick is joined with another steel b) 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<sup>2</sup> respectively. Find the length of each parallel fillet weld. Assume tensile force acting on the plates as static.



What type of stresses induced in shafts? Explain. a)

7

Compare the weight, strength and stiffness of a hollow shaft of the same CO4 b) 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.

#### (OR)

- 8 Design a bushed pin type flexible coupling for connecting a motor shaft to CO3 14 Marks 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 0.8 N/mm<sup>2</sup> and the material of the pin is same as that of shaft and key. Draw neat sketch of the coupling. UNIT-V
- 9 Design and draw a socket and spigot cotter joint to support a load varying CO3 14 Marks 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.

#### (**OR**)

Distinguish between cotter joint and knuckle joint. 10 a) CO1 4 Marks Describe in detail the design procedure of knuckle joint. CO1 10 Marks b)

> (P) (P) (P)

6 Marks CO1

CO4 8 Marks

2

CO1 5 Marks

9 Marks

Max. Marks: 70

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu) II B.Tech II Semester (SVEC-16) Supplementary Examinations, March 2021 DYNAMICS OF MACHINERY [Mechanical Engineering]

Time: 3 hours

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

### UNIT-I

1 Briefly explain the working of cone clutch with neat diagram. a) CO1 4 Marks A plate clutch has three discs on the driving shaft and two discs on the CO2 10 Marks b) 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.

#### (OR)

- 2 a) Discuss the working of prony brake dynamometer with neat sketch and CO1 4 Marks derive the expression for brake power.
  - b) A simple band brake operates on a drum of 600 mm in diameter that is CO2 10 Marks 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<sup>2</sup>?

### UNIT-II

- 3 a) Explain the effect of Gyroscopic couple on Naval ship, when it takes right CO2 7 Marks and left turn, engine is rotating both clockwise and anti clockwise looking from bow side with neat sketches.
  - b) Find the angle of inclination with respect to the vertical of a two wheeler CO3 7 Marks 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<sup>2</sup>; moment of inertia of each road wheel 1 kg-m<sup>2</sup>; 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.

#### (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<sup>2</sup>, 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.

### UNIT-III)

- 5 Briefly discuss about the sensitiveness and stability of governor? a)
  - In a spring loaded governor of the Hartnell type, the mass of each ball is CO3 b) 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.

#### (**OR**)

- 6 Derive the expression for mean speed of a porter governor. CO<sub>2</sub> a) CO3 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  $30^{\circ}$  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°.

### UNIT-IV)

7 What is the need of balancing in rotary and reciprocating engine? Explain CO1 4 Marks a) in detailed? CO4 A, B, C and D are four masses carried by a rotating shaft at radii 100,125, 10 Marks b) 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. (**OR**) 8 Derive the expression for variation of tractive force induced due the partial a) CO<sub>2</sub> 4 Marks balancing of two cylinder locomotives. The following data apply to an outside cylinder uncoupled locomotive: CO<sub>4</sub> 10 Marks b) Mass of rotating parts per cylinder = 360 kg; Mass of reciprocating parts per cylinder = 300 kg; Angle between cranks =  $90^{\circ}$ ; 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.

6 Marks

CO1

4 Marks

10 Marks

8 Marks

## UNIT-V

CO6

6 Marks

- 9 a) Derive the expression for whirling speed of the shaft.
  - b) A machine of mass 75 kg is mounted on springs and is fitted with a CO5 8 Marks 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.

#### (OR)

- 10 a) Derive the natural frequency of transverse vibrations of shaft subjected to CO2 6 Marks different loads by using Dunkerley's method.
  - b) The mass of a single degree damped vibrating system is 7.5 kg and makes CO5 8 Marks 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.

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Time: 3 hours

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

# FLUID MECHANICS

[Mechanical Engineering]

Max. Marks: 70

CO1

14 Marks

#### 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 CO5 14 Marks 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.

#### (OR)

2 Explain the following fluid properties.

i) Surface tension.ii) Viscosity.iii) Weight density.iv) Specific gravity.

### UNIT-II

3 State the force momentum equation. How will you apply momentum CO4 14 Marks equation for determining the force exerted by a flowing liquid in a pipe bend?

#### (OR)

4 The water is flowing through a pipe having diameters 20cm and 10cm at CO2 14 Marks 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<sup>2</sup>, find the intensity of pressure at section 2.

### UNIT-III

5 a) Give explanation of equivalent pipe and flow through parallel pipes.
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.

#### (OR)

6 Derive an expression for the force exerted by a jet of water on a stationary CO5 14 Marks curved vane in the direction of flow.

### UNIT-IV

7 a) Give the classification of turbines with detailed explanation.
b) Describe briefly the function of various main components of pelton CO1 8 Marks turbine with neat sketches.

#### (OR)

8 A turbine develops 7460 kW under a head of 24.7m at 135 r.p.m. What is CO3 14 Marks the specific speed? What would be its normal speed and output under a head of 20.5m?

### UNIT-V

- 9 a) Define centrifugal pump and explain the working procedure of a single- CO1 7 Marks stage centrifugal pump with neat sketch.
  - b) A centrifugal pump is to discharge 0.118m<sup>3</sup>/s at a speed of 1450 r.p.m CO3 7 Marks 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.

### (OR)

10 Explain construction and working principle of a single acting CO1 14 Marks reciprocating pump with a neat diagram.

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Time: 3 hours

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

# MACHINE TOOLS AND MODERN MACHINING PROCESSES

### [Mechanical Engineering]

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 |
| 2  | `` | (OR)                                                                             | 001 | 7 1 1   |
| 2  | a) | Enumerate the factors affecting tool life.                                       | COI | / Marks |
|    | D) | Discuss the Merchant's circle diagram and its importance in machining.           | COI | / 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.                           | COI | 7 Marks |
|    |    | UNIT-III)                                                                        |     |         |
| 5  | a) | Explain the working principle and principal parts of Planer with a neat          | CO1 | 7 Marks |
|    |    | diagram.                                                                         |     |         |
|    | 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.                       | COI | 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 |
|    |    | \$P \$P \$P                                                                      |     |         |

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### THERMAL ENGINEERING-I [Mechanical Engineering]

Time: 3 hours

#### Max. Marks: 70

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

### UNIT-I

| 1 | a) | Discuss the relative merits and demerits of internal combustion and external combustion engines                                                                                                                                                                                                                                                                                                                                                                                                | CO1 | 7 Marks |
|---|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------|
|   | b) | Draw the valve-timing diagram of four-stroke engine and explain the various processes.                                                                                                                                                                                                                                                                                                                                                                                                         | CO1 | 7 Marks |
|   |    | (OR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |         |
| 2 | a) | Describe with working principle theoretical and actual valve timing diagrams of four stroke C.I Engine                                                                                                                                                                                                                                                                                                                                                                                         | CO1 | 7 Marks |
|   | b) | Explain the effect of temperature on specific heats. What is the physical explanation for this variation on the performance of I.C Engine?                                                                                                                                                                                                                                                                                                                                                     | CO2 | 7 Marks |
|   |    | UNIT-II )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     |         |
| 3 | a) | What are the basic parameters that influence the flame speed? Discuss the influence of Engine variables on the flame speed.                                                                                                                                                                                                                                                                                                                                                                    | CO1 | 7 Marks |
|   | b) | What is meant by abnormal combustion? Explain the phenomena of knock in S.I Engines.                                                                                                                                                                                                                                                                                                                                                                                                           | CO1 | 7 Marks |
|   |    | (OR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |         |
| 4 | a) | What are the different required characteristics of a good combustion chamber for S.I. Engine? Explain.                                                                                                                                                                                                                                                                                                                                                                                         | CO1 | 7 Marks |
|   | b) | Explain the different stages of combustion in C.I Engines.                                                                                                                                                                                                                                                                                                                                                                                                                                     | CO1 | 7 Marks |
|   |    | UNIT-III)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     |         |
| 5 | a) | Explain the measurement of brake power of I.C Engine by using rope brake dynamometer.                                                                                                                                                                                                                                                                                                                                                                                                          | CO4 | 7 Marks |
|   | b) | A four cylinder, four stroke diesel engines has brake mean effective pressure of 5.5 bar at full load speed of 600 r.p.m and specific fuel consumption of 0.25 kg/kWh. The cylinder has bore of 25cm and stroke length of 35cm. The air fuel ratio is measured as 26 from the exhaust gas analysis. The ambient conditions are 1 bar, 27°C. 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 |
| 6 | a) | Define indicated power and how it can be determined experimentally for                                                                                                                                                                                                                                                                                                                                                                                                                         | CO1 | 7 Marks |
|   | ,  | multi cylinder engine.                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |         |
|   | b) | A six cylinder, gasoline engine operates on the four stroke cycle. The bore<br>of each cylinder is 80mm and the stroke is 100mm. The clearance volume<br>in each cylinder is 70cc. At a speed of 4000 r.p.m and the fuel<br>consumption is 20 kg/h. The torque developed is 150 N-m. Calculate:<br>i) the brake power.                                                                                                                                                                         | CO3 | 7 Marks |

- 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.

### UNIT-IV

- 7 a) How the exhaust and flue gas analysis carried out?
  - b) The percentage composition of sample of liquid fuel by weight is CO4 7 Marks

CO5

7 Marks

- 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.

#### (OR)

- 8 a) What is the difference between Higher Heating Value (HHV) and Lower CO1 7 Marks Heating Value (LHV) of the fuel?
  - b) One kg of octane ( $C_8H_{18}$ ) is burned with 200% theoretical air. Assuming CO2 7 Marks complete combustion determine.
    - i) Air-fuel ratio.
    - ii) Dew point of the products at a total pressure 100 kPa.

### UNIT-V

- 9 a) Define volumetric efficiency and explain the effect of clearance volume CO1 7 Marks and pressure ratio on volumetric efficiency.
  - b) A single stage double acting air compressor running at 300 r.p.m, delivers CO2 7 Marks 15m<sup>3</sup> of free air per minute at 700 kPa and 200°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°C.

#### (**OR**)

- 10 a) Explain the working principle of single stage single acting reciprocating CO1 7 Marks air compressor with the help of neat sketch.
  - b) A single-stage, double acting compressor has a free air delivery of CO2 7 Marks 14 m<sup>3</sup>/min, measured at 1.013 bar and 15°C. The pressure and temperature in the cylinder during induction are 0.95 bar and 15°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.

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

#### **ANALOG COMMUNICATIONS**

[Electronics and Communication Engineering]

Max. Marks: 70

Time: 3 hours

### 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 $m(t) = A_1 \cos \omega_1 t + A_2 \cos \omega_2 t + A_3 \cos \omega_3 t$ . The signal $m(t)$ modulates carrier $A_c \cos \omega_c t$ . Plot the single-sided spectrum and find the bandwidth of the modulated signal. Assume that $\omega_2 \ge \omega_2 \ge \omega_1$ and $A_1 \ge A_2 \ge A_2$ . | 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)<br>b) | Explain coherent detection of DSBSC modulated wave.<br>Considering the modulating and carrier waves as sinusoids, explain the<br>single tone modulation of SSB wave with necessary expressions, wave-<br>forms and spectrums. Find the percentage of power saved in SSB when<br>compared with AM system.                                                                    | CO1<br>CO5 | 7 Marks<br>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            |
|   |          |                                                                                                                                                                                                                                                                                                                                                                             |            |                    |
| ~ | ``       |                                                                                                                                                                                                                                                                                                                                                                             | 002        | 7 1 1              |
| 3 | a)<br>b) | Draw the AM receiver model and determine the SNK of the AM System.                                                                                                                                                                                                                                                                                                          | $CO_2$     | / Marks            |
|   | D)       | Derive the figure of merit of DSB-SC.                                                                                                                                                                                                                                                                                                                                       | 002        | / Marks            |
| 6 | a)       | (UK)<br>What is pre-emphasis and de-emphasis and explain their operation                                                                                                                                                                                                                                                                                                    | $CO^{2}$   | 0 Marks            |
| 0 | a)<br>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                                                                                                                                                                                                                                                                                                        | CO3        | 7 Marks            |
|   |          | quality factor of the antenna coupling circuit (at the input to the mixer) is                                                                                                                                                                                                                                                                                               |            |                    |
|   |          | i) The image frequency is 455 kHz, calculate:                                                                                                                                                                                                                                                                                                                               |            |                    |
|   |          | i) The image frequency and its rejection ratio at 1000 kHZ.                                                                                                                                                                                                                                                                                                                 |            |                    |
|   |          | $n_j$ The image nequency and its rejection ratio at 25 MinZ.                                                                                                                                                                                                                                                                                                                |            |                    |

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| 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:                                                                         | CO2 | 7 Marks |
|    |    | i) Sensitivity.                                                                                      |     |         |
|    |    | ii) Selectivity.                                                                                     |     |         |
|    |    | iii) Image frequency and its rejection.                                                              |     |         |
|    |    | iv) Fidelity of a super heterodyne receiver.                                                         |     |         |
|    |    | UNIT-V                                                                                               |     |         |
| 9  | a) | Explain the principle of PAM generation with a help of block diagram.                                | CO1 | 8 Marks |
|    |    | Derive the mathematical expressions.                                                                 |     |         |
|    | 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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### 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                                                                                                                                |                |         |
|               |    |                                                                                                                                                                   |                |         |
|               |    | UNIT-I                                                                                                                                                            |                |         |
| 1             | a) | Explain the following terms with reference to CMOS logic.<br>i) Logic '0' and Logic '1'.<br>ii) Noise margin.<br>iv) Propagation delay.                           | CO1            | 7 Marks |
|               | b) | Assess the characteristics of CMOS Dynamic Electrical behavior.<br>(OR)                                                                                           | CO5            | 7 Marks |
| 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 |
| 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 |
| 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 |
| 5             | a) | Draw the IC diagram of 74 $\times$ 999 adder and explain its operation.                                                                                           | CO1            | 7 Marks |
| -             | b) | Explain clearly about 74 $\times$ 148 priority encoder with its logic symbol.<br>Give its truth table and write Verilog HDL code in any one of the model.<br>(OR) | CO4            | 7 Marks |
| 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 |
| 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 |
| 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.<br>Explain the operation with the help of timing waveforms.                            | CO3            | 7 Marks |
| 9             | a) | Suggest alternative ways of representing the ROM                                                                                                                  | CO5            | 7 Marks |
| /             | b) | Write short notes on 2-D decoding commercial types-ROM.<br>(OR)                                                                                                   | CO1            | 7 Marks |
| 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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(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu) II B.Tech II Semester (SVEC-16) Supplementary Examinations, March 2021 ELECTROMAGNETIC THEORY AND TRANSMISSION LINES [Electronics and Communication Engineering]

Time: 3 hours

Max. Marks: 70

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

### UNIT-I

| 1 | a)       | Define electric field strength. Derive an expression for electric field strength of an infinite line charge.                                                                                     | CO1 | 7 Marks    |  |  |  |
|---|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------------|--|--|--|
|   | b)       | Two point charges $-4\mu c$ and $5\mu c$ 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    |  |  |  |
| 2 | a)       | State Ampere's circuital law Derive an expression for the magnetic field                                                                                                                         | CO1 | 7 Marks    |  |  |  |
| _ | )        | intensity of an infinite coaxial transmission line.                                                                                                                                              |     | ,          |  |  |  |
|   | 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 :                                                                                                                                         | CO2 | 7 Marks    |  |  |  |
|   |          | i) Displacement current density.                                                                                                                                                                 |     |            |  |  |  |
|   |          | (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 $\leq 0$ , where $\mu_1=5\mu_0$ . Calculate                                                                                                     | CO2 | 7 Marks    |  |  |  |
|   | ,        | $b_2$ in region y-x-2 $\ge 0$ , where $\mu = 2\mu_0$ .                                                                                                                                           |     |            |  |  |  |
|   |          | 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                                                                                                                                        | CO4 | 7 Marks    |  |  |  |
|   |          | $(\varepsilon_r=4,\mu_r=1,\sigma=10^{-2}$ S/m) has E=30 cos(10 <sup>9</sup> $\pi$ t+ $\pi/4$ ) a <sub>z</sub> V/m at y=0.                                                                        |     |            |  |  |  |
|   |          | Find (i) E at $y=1m$ , $t=2ns$ (ii) H at $y=2m$ , $t=2ns$ .                                                                                                                                      |     |            |  |  |  |
| 6 | a)       | ( <b>UK</b> )<br>Explain about Reflection of a plane wave at an oblique incidence                                                                                                                | COS | 7 Marks    |  |  |  |
| 0 | h)       | In free space $H=0.2 \cos (\omega t - \beta x) a_{a}A/m$ Find the total power passing                                                                                                            | CO4 | 7 Marks    |  |  |  |
|   | 0)       | through a square plate of side 10cm on plane $x+y=1$ .                                                                                                                                           | 001 | / IVIUIIIO |  |  |  |
|   |          |                                                                                                                                                                                                  |     |            |  |  |  |
| 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,                                                                                                               | CO1 | 7 Marks    |  |  |  |
|   | ,        | where C is velocity of light in vacuum. Find R,L,G,C and $\lambda$ at 100MHz.                                                                                                                    |     |            |  |  |  |
|   |          | (OR)                                                                                                                                                                                             |     |            |  |  |  |
| 8 | 8)       | Derive an expression for the input impedance of a transmission line                                                                                                                              | CO6 | 7 Marke    |  |  |  |
| 0 | a)<br>b) | A telephone line has $R=30\Omega/km$ , $L=100mH/km$ G=0 and C=20µF/km At                                                                                                                         | CO1 | 7 Marks    |  |  |  |
|   | ~)       | f=1KHz, calculate                                                                                                                                                                                | 201 | ,          |  |  |  |
|   |          | i) the characteristic impedance of the line                                                                                                                                                      |     |            |  |  |  |

ii) propagation constant and phase velocity.

### UNIT-V

| 9  | a) | Explain the significance of an infinite length line. Also explain about lossless lines                                                                              | CO1 | 7 Marks |
|----|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------|
|    | b) | A lossless $60\Omega$ line with input impedance $Z_{in}=120$ -j $60\Omega$ and load impedance $Z_{I}=60+i60\Omega$ .                                                | CO6 | 7 Marks |
|    |    | <ul><li>i) Find the reflection coefficient and VSWR at load.</li><li>ii) Find the distance between load and generator.</li></ul>                                    |     |         |
|    |    | (OR)                                                                                                                                                                |     |         |
| 10 | a) | Discuss about SC and OC lines and explain with their input impedances.                                                                                              | CO1 | 7 Marks |
|    | b) | A 75 $\Omega$ lossless line is to be matched to a load of 100-j80 $\Omega$ with a shorted stub. Calculate the stub length, its distance from load and the necessary | CO6 | 7 Marks |

stub admittance.

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Time: 3 hours

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### LINEAR IC APPLICATIONS

[Electronics and Communication Engineering]

Max. Marks: 70

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

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| 1 | a)            | Discuss the pole-zero and dominant pole compensation techniques for an                                                     | 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            |
| 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                                                   | CO2        | 7 Marks            |
|   | 1 \           | square wave generator using Op-Amp.                                                                                        | <b>GO2</b> |                    |
|   | b)            | How does negative feedback affect the performance of an inverting amplifier?                                               | CO2        | / Marks            |
|   |               | UNIT-III)                                                                                                                  |            |                    |
| 5 | a)            | Design a second order Butterworth high pass filter having lower cutoff                                                     | CO3        | 7 Marks            |
|   |               | frequency of 1KHz.                                                                                                         |            |                    |
|   | b)            | Differentiate between band pass and band reject filters.                                                                   | CO1        | 7 Marks            |
| 6 |               | (OR)                                                                                                                       | $CO^{2}$   | 7 Martia           |
| 0 | $\frac{a}{b}$ | Explain the following filters                                                                                              | CO3        | 7 Marks<br>7 Marks |
|   | 0)            | i) Notch filter. ii) Band pass filter.                                                                                     | 001        |                    |
|   |               | (UNIT-IV)                                                                                                                  |            |                    |
| 7 | a)            | The monostable multivibrator in the below figure, is to be used as Divide-                                                 | CO4        | 7 Marks            |
|   | ,             | By-3. The frequency of input trigger is 12KHZ. If the value of C is                                                        |            |                    |
|   |               | $0.05\mu$ F, what should be the value of R <sub>A</sub> ?                                                                  |            |                    |
|   |               | • V cc                                                                                                                     |            |                    |
|   |               |                                                                                                                            |            |                    |
|   |               |                                                                                                                            |            |                    |
|   |               |                                                                                                                            |            |                    |
|   |               |                                                                                                                            |            |                    |
|   |               |                                                                                                                            |            |                    |
|   |               | 5 C.                                                                                                                       |            |                    |
|   |               |                                                                                                                            |            |                    |
|   |               | 0 01 µF                                                                                                                    |            |                    |

b) Realize the Schmitt trigger using a 555 timer IC. (OR)

CO5 7 Marks

- 8 a) For a free running oscillator using IC555, for  $R_A$ =6.8 K $\Omega$ ,  $R_B$ =3.3 K $\Omega$  and CO4 7 Marks C=0.5  $\mu$ F, calculate:
  - i) $t_{high}$ .ii) $t_{low}$ .iii)duty cycle.iv) osci

iv) oscillation frequency.

b) How a 555 timer can be used to realize square waveform generator of CO5 7 Marks frequency 3 kHz and duty cycle 50%?

### UNIT-V

- 9 a) Draw the schematic of a DAC. Draw and explain the working principle of CO1 7 Marks a weighted-resistor DAC.
  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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**II B.Tech II Semester (SVEC-16) Supplementary Examinations March – 2021** 

### PROBABILITY AND STOCHASTIC PROCESS

[Electronics and Communication Engineering]

Max. Marks: 70

#### **Answer One Question from each Unit** All questions carry equal marks

### UNIT-I

1 Explain about joint and conditional probability. CO1 a) 6 Marks Three regular dice are thrown. Assign probabilities to the following b) CO3 8 Marks events: the sum of the points appearing on the three dice is. ii) 9. i) 4. iii) 15. (**OR**) 2 How do you explain statistically independent events using Baye's rule? CO1 6 Marks a) In a manufacturing process where glass products are produced, defects or b) CO3 8 Marks 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. (UNIT-II) State and prove the properties of probability density function. 3 CO1 6 Marks a) A continuous random variable X has a PDF  $f_X(x)=3x^2$ ,  $0 \le x \le 1$ , Find 'a' b) CO<sub>2</sub> 8 Marks and 'b' such that: i)  $P\{X \le a\} = P\{x > a\}$ . ii)  $P\{x > b\} = 0.05$ . (**OR**) Define and explain the following distribution and densities with an CO1 4 a) 6 Marks application. i) Exponential. ii) Uniform. b) In an experiment, a trial consists of four successive tosses of a coin. If we CO2 8 Marks define a random variable as the number of heads appearing in a trial, determine the CDF,  $F_{\mathbf{X}}(x)$ . (UNIT-III) 5 State and prove the joint density function properties. CO1 6 Marks a) If statistically independent random variables X and Y having respective CO2 8 Marks b) 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. (**OR**) 6 Identify the value of moment  $\mu_{22}$ , if statistically independent random CO3 8 Marks a) variables X and Y have moments  $m_{10} = 2$ ,  $m_{20} = 14$ ,  $m_{02} = 12$  and  $m_{11} = -6.$ Explain about the monotonic transformation for a continuous random CO2 b) 6 Marks variable.
#### UNIT-IV)

7 a) A stationary random process X(t) with zero mean and autocorrelation CO2 8 Marks  $R_{xx}(\tau) = [e^{-2|\tau|}]$  is applied to a system of function  $H(\omega) = \frac{1}{2 + j\omega}$  develop

the PSD of output.

- b) Derive the expression for mean and mean squared value of system CO2 6 Marks response. (OR)
- a) Define the terms:

8

- i) Random process.
- ii) Stationary random process.
- iii) Wide sense stationary random process.
- iv) Ergodic random process.
- b) Consider a linear system as shown in figure:

$$X(t) \longrightarrow \boxed{\frac{1}{6+j\omega}} \longrightarrow Y(t)$$

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.

#### 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, CO3 8 Marks by a resistor of 2KΩ operating at 20°C. Find the available noise power over this bandwidth. Find the noise PSD.

#### (**OR**)

- 10 a) Two thermal resistors  $R_1$  and  $R_2$  at temperatures  $T_1$  and  $T_2$  are connected CO4 7 Marks in series. Find the noise temperature of the combination. Find the noise temperature when  $R_1 = R_2$ .
  - b) Obtain an expression to find noise band width of the system. CO4 7 Marks

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CO2 8 Marks

6 Marks

CO1

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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

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

#### UNIT-I

- 1 a) In an RC low pass circuit R=2 k $\Omega$  and C=1  $\mu$ F. A square with half period CO2 7 Marks of 5  $\mu$ Sec. is applied as input to this circuit. Determine the output waveform.
  - 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 CO4 8 Marks the output waveforms for the cases (i) T = 0.2 RC (ii) T = RC (iii) T = 5RC.
  - b) Why does a resistive attenuator need to be compensated? Explain different CO5 6 Marks methods of compensation.

#### UNIT-II

3 a) Determine  $V_0$  for the network shown in figure for the given waveform. CO4 8 Marks Assume ideal Diodes.



b) Draw the basic circuit diagram of negative peak clamper circuit and explain CO1 6 Marks its operation.

#### (**OR**)

- 4 a) Design a Clipper circuit for a sinusoidal input of 50V(P-P) which produces CO3 8 Marks an output with double sided clipper with  $VR_1 = +7V$  and  $VR_2 = -10V$  and assume diodes are ideal.
  - b) Draw the basic circuit diagram of positive peak clamper circuit and explain CO2 6 Marks its operation.

#### UNIT-III)

- 5 a) Design a transistor switch with the following data:  $V_{CC} = 12 \text{ V}$ ,  $V_{BB} = 6 \text{ V}$ ; CO3 7 Marks Ic(sat) = 10mA;  $h_{FE}(\text{min}) = 40$ . Assume the junction voltages as  $V_{CE}(\text{sat}) = 0.3 \text{ V}$  and  $V_{BE}(\text{sat}) = 0.7 \text{ V}$ .
  - b) With the help of a neat circuit diagram and waveforms explain the working CO2 7 Marks of Collector-coupled astable multivibrator.

#### (OR)

- 6 a) Draw the neat circuit diagram of a collector coupled monostable CO1 8 Marks multivibrator and explain its operation with the help of waveforms.
  - b) Draw and explain about the response of Schmitt circuit for the following. CO3 6 Marks i) for loop gain  $\leq 1$  ii) loop gain > 1.

Max. Marks: 70

#### 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 CO2 7 Marks base circuits define the following terms:

i) Fly back time. ii) Transmission error.

#### (OR)

- 8 a) The specifications of UJT are given as  $\eta = 0.6 V_v = 2V$ ,  $R_{BB} = 5 K\Omega$ ,  $I_v = 1.5 CO4$  8 Marks 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.
  - b) What is meant by triggered sweep? What are the merits and demerits of CO2 6 Marks triggered sweep circuits.

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

#### **COMPUTER GRAPHICS**

[Computer Science and Engineering]

| Time | Time: 3 hours<br>Answer One Question from each Unit<br>All questions carry equal marks |                                                                                                                                        | Max. I     | Marks: 70           |  |  |  |
|------|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|------------|---------------------|--|--|--|
|      |                                                                                        |                                                                                                                                        |            |                     |  |  |  |
| 1    | a)<br>b)                                                                               | What is Cathode Ray Tube? Explain its usage.<br>Explain the working of Direct View Storage Tube.                                       | CO1<br>CO1 | 7 Marks<br>7 Marks  |  |  |  |
| 2    | a)<br>b)                                                                               | Generate a Line between (12, 10) and (20, 18) using DDA algorithm.<br>Derive the equations for Ellipse generation.                     | CO3<br>CO3 | 7 Marks<br>7 Marks  |  |  |  |
| 3    | a)                                                                                     | <b>UNIT-II</b><br>Derive a transformation matrix for the Reflection with respect to a line                                             | $CO^2$     | 7 Marks             |  |  |  |
| 5    | u)<br>h)                                                                               | passing through origin.<br>Explain the Scan Line polygon fill algorithm                                                                | CO3        | 7 Marks             |  |  |  |
|      | 0)                                                                                     | (OR)                                                                                                                                   | 005        | / 10101185          |  |  |  |
| 4    | a)<br>b)                                                                               | Illustrate the Associative property of 2D Transformations.<br>What is Homogenous coordinate? Explain.                                  | CO2<br>CO1 | 7 Marks<br>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             |  |  |  |
| 6    | a)<br>b)                                                                               | Explain the 2-D Viewing pipeline.<br>Explain the Bezier curves and surfaces.                                                           | CO1<br>CO5 | 7 Marks<br>7 Marks  |  |  |  |
|      |                                                                                        | UNIT-IV                                                                                                                                |            |                     |  |  |  |
| 7    | a)<br>b)                                                                               | Explain basic 3-D Geometric Transformations.<br>Derive a composite matrix for 3-D Rotation with respect to an axis parallel to Y-axis. | CO2<br>CO2 | 7 Marks<br>7 Marks  |  |  |  |
| 0    | ``                                                                                     | (OR)                                                                                                                                   | 004        | 10.16 1             |  |  |  |
| 8    | a)<br>b)                                                                               | Explain the 3-D Viewing pipeline.                                                                                                      | CO4<br>CO1 | 10 Marks<br>4 Marks |  |  |  |
|      |                                                                                        | UNIT-V                                                                                                                                 |            |                     |  |  |  |
| 9    | a)                                                                                     | Explain the Depth sorting method.                                                                                                      | CO5        | 7 Marks             |  |  |  |
|      | b)                                                                                     | Explain Area-subdivision and Octree methods.<br>(OR)                                                                                   | CO5        | 7 Marks             |  |  |  |
| 10   | a)<br>b)                                                                               | Classify visible-surface detection algorithms.<br>List and explain the steps involved in Gouraud shading                               | CO5<br>CO5 | 4 Marks<br>10 Marks |  |  |  |
|      | -)                                                                                     | କ୍ କ୍ କ୍                                                                                                                               |            |                     |  |  |  |

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu) II B.Tech II Semester (SVEC-16) Supplementary Examinations, March 2021 DATABASE MANAGEMENT SYSTEMS [Computer Science and Engineering, Information Technology, Computer Science and Systems Engineering]

Time: 3 hours Max. Marks: 70 **Answer One Question from each Unit** All questions carry equal marks UNIT-I 1 Explain the drawbacks of conventional file processing system. CO1 6 Marks a) List and explain various database languages with examples. 8 Marks b) CO1 (**OR**) 2 Explain the following: CO2 14 Marks i) Entity set ii) Relationship set iii) Weak-entity set. UNIT-II Discuss in detail about Entity set, Relationship set and different types of 3 CO2 8 Marks a) relationships. List and explain about structural constraints of ER model. 6 Marks b) CO<sub>2</sub> (**OR**) 4 What is relational algebra? How it is different from other relational CO1 8 Marks a) languages? List out and explain different relational algebraic operations with example. Differentiate TRC and DRC. b) CO<sub>2</sub> 6 Marks UNIT-III 5 By considering an example describe various data update operations in CO1 7 Marks a) SQL. Write and explain the structure of SQL SELECT statement with suitable b) CO1 7 Marks example. (**OR**) Explain the need of normalization. 6 a) CO<sub>2</sub> 6 Marks Describe 4NF and 5NF with suitable examples. CO2 8 Marks b) UNIT-IV 7 Describe the properties of a transaction. CO4 6 Marks a) Define Serializability. What is the difference between conflict equivalence b) CO4 8 Marks and view equivalence? (**OR**) 8 Explain about different types of failures occurred in the system. CO1 a) 7 Marks Explain the concept of locking mechanism. State and explain two-phase b) CO2 7 Marks locking protocol. UNIT-V Describe various methods of defining indexes on multiple keys. 9 CO1 a) 6 Marks What is an index structure? Explain how to use hash table as an index CO2 8 Marks b) structure for a database. (**OR**) 10 Write short notes on: CO2 14 Marks i) Hash based indexing; ii) B-trees. <del>(</del>) <del>(</del>@} (j)

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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

#### **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 CO5 14 Marks an ideal OP-AMP.

#### (**OR**)

- 2 Identify the limitations of an op-amp differential amplifier and derive the CO5 a) 7 Marks output voltage of an op-amp based differential amplifier.
  - Sketch the circuit diagram and explain the operation of an inverting CO1 b) 7 Marks amplifier.

#### UNIT-II

Design a Integrator to integrate an I/P signal that varies in frequency from 3 a) CO4 7 Marks 1KHz to 10 KHz and plot the O/P wave forms if the I/P is a sine wave of1Vpeak at 1 KHz. In a second-order high pass Butterworth filter  $C2 = C3 = 0.047 \mu f$ , CO4 b) 7 Marks R2=R3= 3.3K $\Omega$ , R1 = 27 K $\Omega$  and RF=15.8 KW. Determine the low cutoff frequency fL of the filter (**OR**) Determine the order of the Butterworth low-pass filter so that at 4 a) CO3 7 Marks w=1w3dB, the magnitude response is down by at least 20 dB. Design a second order low pass filter for a cutoff frequency of 2KHz. CO3 7 Marks b) (UNIT-III) 5 A 12-bit D to A converter has a full-scale range of 15 volts. Its maximum CO4 9 Marks a) differential linearity error is  $\pm 1/2$  LSB. i) What is the percentage resolution? ii) What are the minimum and maximum possible values of the increment in its output voltage? Distinguish between astable, monostable multivibrators. CO2 5 Marks b) **(OR)** Describe in detail the operation of a dual slope Analog to digital converter. 6 CO1 7 Marks a) A PLL has a free running frequency of 500 KHz, the bandwidth of the CO4 7 Marks b) LPF=10KHz. Will the PLL lock in if  $f_i = 60$  KHz? What is the frequency of the VCO outputs? UNIT-IV) Explain the following terms with reference to CMOS logic. 7 a) CO1 7 Marks i) Logic Levels. ii) DC Noise margin. iii) Power supply rails. iv) Propagation delay. Asses the behavior of CMOS Inverter for LOW and HIGH outputs and CO6 7 Marks b) sketch its equivalent resistive model. (**OR**) Design CMOS transistor circuit for 2-input NOR gate. With the help of 8 CO3 7 Marks a) function table explain the circuit. CO4 b) Design a CMOS transistor circuit that has the functional behaviour. 7 Marks f(X) = (A + B).(B + C).

Max. Marks: 70

#### UNIT-V Use appropriate structure to develop 8:1 Multiplexer using 2:1 CO5 9 7 Marks a) multiplexer. Write a verilog program for an edge triggered RS flip-flop. 7 Marks b) CO4 (OR) Design a 4-bit binary synchronous counter using 74 x 74. 10 a) CO3 7 Marks Design a module-10 counter using two 74 x 163 binary counters. b) CO4 7 Marks

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#### 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 On what parameters the computers are classified? Explain the types of CO1 7 Marks a) computers with their applications. Briefly explain about the functional units of a computer. b) CO1 7 Marks (**OR**) 2 Explain the construction and working of one cell of DRAM and ROM. 7 Marks a) CO1 Compare SRAM and DRAM. 7 Marks CO<sub>2</sub> b) UNIT-II 3 Draw the timing diagram for the instruction ADI 35H. Analyze the CO2 10 Marks a) sequence of operations involved in the execution of the said instruction. The content of the Accumulator of 8085 processor is 56H. Write the steps b) CO5 4 Marks to mask the lower nibble of Accumulator using suitable i) Arithmetic. ii) Logical instructions. (**OR**) If the 8085 microprocessor adds the bytes 87H and 79H, specify the 4 CO2 8 Marks a) contents of the accumulator and the status of all the flags. Discuss the following instructions of 8085 microprocessor. CO1 6 Marks b) i) RIM. ii) SIM. UNIT-III)
- 5 a) Differentiate vectored and non-vectored interrupts. Explain the interrupt CO1 8 Marks handling mechanism of 8085.
  - b) For the interface shown below, show the address map of the device CO4 6 Marks connected to Y5.



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 CO5 7 Marks cumulatively add eight bytes of data stored in eight consecutive memory locations.

| 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     | CO5 | 7 Marks |  |  |
|    |      | and subtraction.                                                          |     |         |  |  |
|    | b)   | Differentiate between hardwired control and microprogrammed control. Is   | CO2 | 7 Marks |  |  |
|    |      | it possible to have a hardwired control associated with a control memory? |     |         |  |  |
|    |      | (OR)                                                                      |     |         |  |  |
| 10 | a)   | Develop an efficient algorithm perform binary multiplication using Booth  | CO5 | 7 Marks |  |  |
|    |      | algorithm.                                                                |     |         |  |  |
|    | b)   | "Pipelining increases speed of execution". Justify.                       | CO6 | 7 Marks |  |  |
|    |      |                                                                           |     |         |  |  |

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# (UNIT-IV)

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#### 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:                        | CO4 | 7 Marks |
|   |    | T(n) = 1, if n=1 or                                             |     |         |
|   |    | $T(n) = T(n-1) + n(n-1)$ , if $n \ge 2$                         |     |         |
|   |    | (OR)                                                            |     |         |
| 2 | a) | Define pseudocode. Explain its significance with example.       | CO1 | 7 Marks |
|   | b) | Evaluate the time complexity of the below pseudocode:           | CO4 | 7 Marks |
|   |    | Algorithm Sample                                                |     |         |
|   |    | {                                                               |     |         |
|   |    | temp=1                                                          |     |         |
|   |    | repeat {                                                        |     |         |
|   |    | for $i=1$ to n                                                  |     |         |
|   |    | {                                                               |     |         |
|   |    | temp = temp + 1;                                                |     |         |
|   |    | n = n/2;                                                        |     |         |
|   |    | }                                                               |     |         |

} until  $n \le 1$ ;

}

#### UNIT-II)

3 a) Explain disjoint set operations with an example.
b) Outline UNION and FIND algorithms and calculate their time CO3 7 Marks complexities.

#### (OR)

4 a) Outline an algorithm of DFS and calculate its time complexityCO27 Marksb) Apply DFS algorithm for the following graph:CO37 Marks



# UNIT-III

# 5 a) Outline the merge sort algorithm and calculate time complexityCO47 Marksb) Apply merge sort algorithm on the following elementsCO37 Marks35, 57, 23, 2, 56, 68, 10, 20, 65, 457 Marks

#### (OR)

- 6 a) Distinguish divide and conquer and greedy algorithms. Illustrate with an CO2 7 Marks example.
  - b) Consider the digraph given in the following figure. Estimate shortest paths CO5 7 Marks from vertex 5 to other vertices. Explain each step in detail.



#### 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 CO4 7 Marks of w that sum to m. Draw the portion of the state space trees that is generated.
  b) What is graph coloring? Outline an algorithm which finds m-coloring of a CO1, 7 Marks
  - b) What is graph coloring? Outline an algorithm which finds m-coloring of a CO1, 7 Marks graph. CO3

#### 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 CO5 14 Marks Problem. Explain with an example.

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

#### JAVA PROGRAMMING

#### [Computer Science and Engineering, Information Technology]

**Answer One Ouestion from each Unit** 

All questions carry equal marks UNIT-I Java is platform independent. Justify. CO4 6 Marks 1 a) What are the different operators available in java? 8 Marks CO1 b) (**OR**) 2 Explain method overloading with example. CO2 8 Marks a) Write a program to perform the following functions using classes, objects CO5 6 Marks b) and constructors wherever necessary. i) Read 5 subjects marks of 5 students. ii) Calculate the total and print the result on the screen. UNIT-II ) Discuss about super keyword usage in inheritance with suitable programs. 3 CO2 a) 8 Marks What is abstract class? How it implemented in java? CO2 6 Marks b) (**OR**) What is interface? Explain its significance. CO3 4 a) 7 Marks How multiple inheritance is implemented in java? b) CO3 7 Marks (UNIT-III) 5 Explain with example, how we set priority to threads. CO1 7 Marks a) How to handle multiple catch blocks for a nested try block? Explain with b) CO5 7 Marks an example. (**OR**) Write a java program to implement producer consumer problem. CO5 8 Marks 6 a) b) Explain various thread states and properties. CO1 6 Marks UNIT-IV 7 a) Briefly explain about applet life cycle. CO1 7 Marks Illustrate about AWT class Hierarchy. CO3 7 Marks b) (**OR**) How to pass the parameters to an Applet? Explain with example. CO1 8 a) 6 Marks Discuss about Java Collection Frame work. CO<sub>2</sub> 8 Marks b) UNIT-V 9 Explain in detail about servlet Life cycle. CO<sub>2</sub> 6 Marks a) Discuss about Delegation event model with example. CO5 8 Marks b) (**OR**) Illustrate about servlet API. CO3 10 a) 7 Marks Elucidate about MVC Architecture. CO3 7 Marks b) (P) R

Max. Marks: 70

Time: 3 hours

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#### 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

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

Max. Marks: 70

#### cstions carry equari

#### 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:                                                                                                 | CO5         | 8 Marks  |
|    |    | i) Elicitation. ii) Validation.                                                                                |             |          |
|    |    | iii) Management. iv) Documents.                                                                                |             |          |
|    | b) | Explain different types of checks should be carried out on the                                                 | CO4         | 6 Marks  |
|    |    | requirements in the requirements document.                                                                     |             |          |
|    |    | (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,<br>CO6 | 10 Marks |

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

#### **THEORY OF COMPUTATION**

[Information Technology, Computer Science and Systems Engineering]

Time: 3 hours

#### **Answer One Question from each Unit** All questions carry equal marks

#### UNIT-I

1 Define Finite Automaton and give its mathematical representation. a) CO1 3 Marks Design equivalent NFA for the following NFA with *\varepsilon*-transition, where q1 b) CO3 7 Marks is an initial and also final state respectively.

| so mai state respectively, |    |    |    |  |  |  |  |
|----------------------------|----|----|----|--|--|--|--|
|                            | A  | b  | 3  |  |  |  |  |
| - *q1                      | Φ  | Φ  | q2 |  |  |  |  |
| q2                         | q3 | q4 | Φ  |  |  |  |  |
| q3                         | Φ  | q2 | Φ  |  |  |  |  |
| q4                         | Φ  | Φ  | q1 |  |  |  |  |

Differentiate between NFA and DFA. c)

for L1 and L2.

#### (**OR**)

- Design an NFA for the set of all strings such that the third symbol from 2 CO3 4 Marks a) the right end is '1' over  $\Sigma = \{0, 1\}$ .
  - The following are two finite automata M1 (Q1, {0,1}, q0,  $\delta1$ , {q0, q1}) CO2. 10 Marks b) and M2 (O2, {0,1}, p0,  $\delta2$ , {p2}) corresponding to regular languages CO3, L1 and L2 with the transition functions given below. CO5 For machine M1,  $\delta 1(q0,0)=q1$ ,  $\delta 1(q0,1)=q0$ ,  $\delta 1(q1,0)=q2$ ,  $\delta 1(q1,1)=q0$ ,  $\delta 1(q_{2},0)=q_{2}, \delta 1(q_{2},1)=q_{2}$ , where q0 is an initial and a final state and q2 is a final state respectively. For machine M2,  $\delta 2(p0,0)=p1$ ,  $\delta 2(p0,1)=p0$ ,  $\delta^2(p_{1,0})=p_{1,0}$ ,  $\delta^2(p_{1,1})=p_{2,0}$ ,  $\delta^2(p_{2,0})=p_{1,0}$ ,  $\delta^2(p_{2,1})=p_{0,0}$ . Here p0 is an initial state and p2 is a final state. Draw transition diagram and transition table

3 a) Derive Regular-Expression for the following FA using  $R_{ii}^{K}$  notation. CO3 10 Marks



Design NFA with €- transitions for the following regular expressions, b) CO3 4 Marks i) b(a+b)\*a. ii) (0 + 1) \* (11 + 00).

#### (**OR**)

- Summarize the properties of regular expressions. 4 CO1 4 Marks a) Is  $L = \{\text{Set of strings of equal number of } a's \text{ and } b's\}$  Regular? Justify. 4 Marks b) CO<sub>2</sub> L1 and L2 are two regular sets. Justify the following. CO2, 6 Marks c) i)  $L1 \Omega L2$  is Regular. CO5 ii) L1.L2 is Regular.
  - iii) L1UL2 is Regular.

Max. Marks: 70

CO<sub>2</sub> 4 Marks

# (UNIT-III)

| 5  | a)  | Is the following CFG is ambiguous?                                                                                          | CO4        | 7 Marks    |
|----|-----|-----------------------------------------------------------------------------------------------------------------------------|------------|------------|
|    |     | $E \rightarrow E + E/E * E/(E)/id$ . Justify your answer with valid example. Find                                           |            |            |
|    | 1-) | equivalent unambiguous grammar.                                                                                             | 004        | 7 \ ( 1    |
|    | D)  | when do you say that a CFG is Unamolguous? Is the following CFG is<br>ambiguous or not? Justify your answer with an example | CO4,       | / Marks    |
|    |     | $S \rightarrow if F$ then $S S \rightarrow if F$ then $S else S F \rightarrow O$ ther Find an equivalent                    | 005        |            |
|    |     | unambiguous CFG.                                                                                                            |            |            |
|    |     | (OR)                                                                                                                        |            |            |
| 6  | a)  | Define Useless symbol, Unit production and Null Production. Give                                                            | CO1,       | 7 Marks    |
|    |     | examples.                                                                                                                   | CO5        |            |
|    | b)  | Find an equivalent Reduced grammar from the following CFG.                                                                  | CO2,       | 7 Marks    |
|    |     | 1) $S \rightarrow ABa/Bc$ . 11) $A \rightarrow ac/Bcc$ . 11) $B \rightarrow bcc$ . 1V) $C \rightarrow a$ .                  | CO4        |            |
| -  |     |                                                                                                                             | <b>G 0</b> | 5 ) ( 1    |
| 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.                                                                               | COI        | 3 Marks    |
| 0  | a)  | (UK)                                                                                                                        | $CO^{2}$   | 7 Marka    |
| 0  | a)  | Is the following Language is fit DA of DI DA? Justify your answer<br>$I = \{a^{i}b^{j}c^{k}   l > i \text{ or } i < k\}$    | 002        | / IVIAINS  |
|    | b)  | Design PDA for the following language                                                                                       | CO1        | 7 Marks    |
|    | 0)  | $L = \{a^n b^m / m \ge n k m - n \text{ is even}\}$                                                                         | CO3        | , 1,101115 |
|    |     | Define all the elements of PDA.                                                                                             |            |            |
|    |     | UNIT-V                                                                                                                      |            |            |
| 9  | a)  | Examine the formal definition of a TM to answer the following questions                                                     | CO5        | 8 Marks    |
|    |     | and explain with your reasoning.                                                                                            |            |            |
|    |     | i) Can a TM ever write the blank symbol B on its tape?                                                                      |            |            |
|    |     | 11) Can the tape alphabet $\Gamma$ be the same as input alphabet $\Sigma$ ?                                                 |            |            |
|    |     | 111) Can a I M's head ever be in the same location in two                                                                   |            |            |
|    |     | iv) Can a TM Contain just a single state?                                                                                   |            |            |
|    | b)  | Design TM for $I = \{a^n b^{2n}   n > -1\}$                                                                                 | CO3        | 6 Marks    |
|    | 0)  | Design TW for $L = \{u, v, v, n \ge -1\}$ .                                                                                 | 005        | 0 IVIUIKS  |
| 10 | a)  | Define Turing Machine and Construct a TM accepting the language.                                                            | CO1        | 7 Marks    |
| -  | ,   | $L = \{a^{n}b^{m+n}c^{m}/m, n \ge 1\}.$                                                                                     |            |            |
|    | b)  | Design a TM to compute m-n, where m and n are positive integers and                                                         | CO3        | 7 Marks    |
|    | ,   | m > n.                                                                                                                      |            |            |
|    |     |                                                                                                                             |            |            |

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| CODE N  | No.: 19BT4HS01                                                                                                                              |                                |               | SV    | EC-19              |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------------|-------|--------------------|
|         | Roll No                                                                                                                                     | ).                             |               |       |                    |
|         | SREE VIDYANIKETHAN ENGINEERING CO                                                                                                           | LLEGE                          |               |       |                    |
|         | (An Autonomous Institution, Affiliated to JNTUA, Ananthapur<br>II B.Tech II Semester (SVEC-19) Regular Examination<br>BANKING AND INSURANCE | <sup>amu)</sup><br>18 August – | - 2021        |       |                    |
|         | [Civil Engineering, Mechanical Engineering, Computer Scient<br>Information Technology, Computer Science and System                          | ce and Engi<br>s Engineeri     | neerin<br>ng] | lg,   |                    |
| Time: 3 | hours                                                                                                                                       | 0                              | Max           | Marks | 60                 |
|         | Answer One Question from each Unit<br>All questions carry equal marks                                                                       |                                | 1,100         |       |                    |
|         | UNIT-I                                                                                                                                      |                                |               |       |                    |
| 1.      | Explain the role of banks in transferring money from surplus to deficit.                                                                    | 12 Marks                       | L3            | CO2   | PO5<br>PO12        |
|         | (OR)                                                                                                                                        |                                |               |       |                    |
| 2.      | Elaborate the role of RBI in controlling the economic conditions of the Country.                                                            | 12 Marks                       | L3            | CO1   | PO3<br>PO11        |
|         | UNIT-II                                                                                                                                     |                                |               |       |                    |
| 3.      | Explain the types of accounts and loans offered by banks. <b>(OR)</b>                                                                       | 12 Marks                       | L3            | CO1   | PO3                |
| 4.      | Explain the procedure of opening and closing an account.                                                                                    | 12 Marks                       | L3            | CO2   | PO5<br>PO12        |
|         | (UNIT-III)                                                                                                                                  |                                |               |       |                    |
| 5.      | Elaborate on the various types of e-payment systems.                                                                                        | 12 Marks                       | L3            | CO1   | PO3<br>PO11        |
|         | (OR)                                                                                                                                        |                                |               |       |                    |
| 6.      | Differentiate between B2C and B2B.                                                                                                          | 12 Marks                       | L3            | CO2   | PO3<br>PO5<br>PO12 |
| 7       |                                                                                                                                             | 10.14                          | т о           | 000   | DO2                |
| 7.      | Elaborate the role of insurance in minimizing risk.                                                                                         | 12 Marks                       | L3            | 002   | PO3<br>PO5<br>PO12 |
| 0       | (OR)                                                                                                                                        |                                |               |       |                    |
| 8.      | Explain the elements of Insurance.                                                                                                          | 12 Marks                       | L3            | CO2   | PO3<br>PO12        |
| 0       | UNIT-V                                                                                                                                      | 10.14                          | тa            | 0.01  | DOA                |
| 9.      | Outline the fundamental principles of insurance.                                                                                            | 12 Marks                       | L3            | COI   | PO3<br>PO11        |
| 10      | (OR)<br>According to insurance agreement, enlist the rights and<br>responsibilities of insured.                                             | 12 Marks                       | L3            | CO2   | PO3<br>PO5<br>PO12 |

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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. Explain the role of social media networks in business 6 Marks L4 CO1 **PO1** a) communication. 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 12 Marks L5 CO<sub>2</sub> PO<sub>6</sub> you overcome them? UNIT-II 3. a) How do you improve cross cultural communication in a global 6 Marks L3 CO<sub>2</sub> **PO6** firm? Illustrate the use of communication in a business crisis. 6 Marks L3 CO3 b) PO3 (**OR**) 4. How do you use communication to be a responsible corporate 12 Marks L3 CO1 PO<sub>6</sub> citizen? (UNIT-III) Advocate the need for effective business correspondence. 6 Marks L3 CO3 5. a) PO5 List out the Common components of business letters. b) 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 Explain the need for follow-up letters after sending a resume. b) 6 Marks L2 CO3 **PO10** (**OR**) 8. Discuss the need and process for online recruitment to tap global 12 Marks L3 CO1 PO5 talent. UNIT-V 9. Suggest important preparation tips for conducting interviews. 6 Marks L3 CO4 PO5 a) How do you plan to use different types of questions in interview b) 6 Marks L6 CO4 **PO1** process? (OR)How do you use different styles of interviewing in selecting 10 12 Marks L4 CO<sub>4</sub> PO<sub>6</sub> executive cadres?

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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

#### COST ACCOUNTING AND FINANCIAL MANAGEMENT

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

| Т  | Time: 3 hours |                                                                        |         |            |              | Max. Marks: 60      |  |  |
|----|---------------|------------------------------------------------------------------------|---------|------------|--------------|---------------------|--|--|
|    |               | Answer One Question from each Unit                                     |         |            |              |                     |  |  |
|    |               | All questions carry equal marks                                        |         |            |              |                     |  |  |
|    |               |                                                                        |         |            |              |                     |  |  |
|    |               |                                                                        |         | <b>.</b> . | <b>G A A</b> | DOI                 |  |  |
| 1. | a)            | Explain the meaning of Cost and Cost Accounting.                       | 6 Marks | L1         | COl          | PO1                 |  |  |
|    | b)            | Discuss the Objectives of Cost Accounting.                             | 6 Marks | L3         | CO2          | PO5                 |  |  |
| •  |               | (OR)                                                                   |         | <b>T</b> 1 | 001          | <b>D</b> O <b>0</b> |  |  |
| 2. | a)            | Explain the meaning of Management Accounting and how it is             | 6 Marks | LI         | COI          | PO2                 |  |  |
|    | 1 \           | different from Cost Accounting.                                        |         | т о        | 000          | 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       | 6 Marks | L3         | CO2          | PO2                 |  |  |
|    |               | 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/-                                           |         |            |              |                     |  |  |
| ~  |               | (OR)                                                                   |         | <b>T</b> 1 | 001          | DOA                 |  |  |
| 6. | a)            | Explain about Material variances. How do you calculate?                | 6 Marks |            | COI          | PO3                 |  |  |
|    | b)            | From the following information, calculate Direct Labour cost variance: | 6 Marks | L3         | CO2          | PO5                 |  |  |
|    |               | Standard wage rate per hour : Rs. 5                                    |         |            |              |                     |  |  |
|    |               | Standard time set : 1000 hours                                         |         |            |              |                     |  |  |
|    |               | Actual wage rate per hour : Rs. 6                                      |         |            |              |                     |  |  |
|    |               | Actual time taken : 980 hours                                          |         |            |              |                     |  |  |
|    |               | 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           | 6 Marks | L3         | CO2          | PO2                 |  |  |

b) Discuss different types of Ratios in analyzing the financial 6 Marks L3 CO2 PO2 statements.

| ( | (OR) | ) |
|---|------|---|
|   |      |   |

6 Marks

6 Marks

L1

L3

CO1

CO2

PO4

PO2

8. a) Explain Capital Budgeting decision of Financial Management.

| Liabilities       | Rs       | Assets           | Rs       |  |
|-------------------|----------|------------------|----------|--|
| Shara conital     | 2 00 000 | Land &           | 1 40 000 |  |
| Share capital     | 2,00,000 | Building         | 1,40,000 |  |
| Drofit & Loss a/a | 20,000   | Plant &          | 3,50,000 |  |
| FIOIT & LOSS a/C  | 30,000   | Machinery        |          |  |
| 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:

b)

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 |

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CODE No.: 19BT4HS10

Time: 3 hours

SVEC-19

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

Roll No.

(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 ]

Max. Marks: 60

Answer One Question from each Unit

All questions carry equal marks

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| 1. |               | Classify different types of personalities briefly.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 12 Marks  | L2         | CO3      | PO1         |
|----|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------|----------|-------------|
|    |               | (OR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |           |            |          |             |
| 2. | a)            | "Self-awareness is the key in personality development." Justify                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 6 Marks   | L5         | CO1      | PO1         |
|    |               | the given statement.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |           |            | ~ ~ .    |             |
|    | b)            | Explain the key leadership traits that originate from one's                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 6 Marks   | L2         | COI      | PO9         |
|    |               | personality.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           |            |          |             |
|    |               | 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)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |           | <b>T A</b> | 001      | DO 10       |
| 4. | a)            | Explain the role of feedback in self-development.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 6 Marks   | L2         | COL      | PO10        |
|    | D)            | Differentiate Mentoring and Counseling.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 6 Marks   | L4         | 003      | POIO        |
| _  |               | UNIT-III)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |           |            |          |             |
| 5. | a)            | Discuss the significance of attitude in understanding the                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 6 Marks   | L2         | CO2      | PO2         |
|    | 1 \           | personality of an individual.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |           | ти         | 000      | DOO         |
|    | b)            | Distinguish between attitude and behavior.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 6 Marks   | L4         | 002      | PO2         |
| 6  |               | (UR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 12 Montra | 15         | cor      | DOD         |
| 0. |               | Is it fearly possible to change negative autitude of a person?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 12 Marks  | LJ         | 02       | PO2         |
|    |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |           |            |          |             |
| -  |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 10.14     | т о        | 000      | DO11        |
| 7. |               | Illustrate different leadership styles.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 12 Marks  | L3         | CO3      | POTT        |
| 0  | a)            | (UR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ( Marlin  | т 4        | COL      | <b>DO10</b> |
| ð. | a)<br>b)      | Identify different ways through which a manager communication                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | o Marks   | L4         | COI      | POID        |
|    | 0)            | number of the second se | 6 Marks   | L2         | CO1      | PO10        |
|    |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |           |            |          |             |
| 0  |               | CONTI-V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 12 Maular | 1.2        | 004      | DOF         |
| 9. |               | Explain the significance of time management in real life using suitable exemples                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 12 Marks  | L2         | 004      | PO5         |
|    |               | suitable examples.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           |            |          |             |
| 10 | 8)            | Differentiate Ethics and Self-Righteousness                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 6 Marks   | I 4        | $CO^{2}$ | POS         |
| 10 | $\frac{a}{b}$ | "Being practical is the need of the hour" Defend the Statement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 6 Marks   | L5         | $CO_{2}$ | PO8         |
| •  | 0)            | Denis producti is the need of the notif. Defend the Statement.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0 muns    |            | 007      | 100         |
|    |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |           |            |          |             |

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CODE No.: 19BT4HS11

Time: 3 hours

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

#### **PROFESSIONAL ETHICS**

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

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            | 12 Marks  | L2         | CO3        | PO8          |
|    |          | between moral autonomy and moral absolutism.                           |           |            |            |              |
|    |          | (UNIT-II)                                                              |           |            |            |              |
| 3. | a)       | Explain the term 'professional accountability' with examples.          | 6 Marks   | L4         | CO1        | PO1          |
|    | b)       | Discuss the following:                                                 | 6 Marks   | L4         | COI        | PO1          |
|    |          | 1) Integrity, Self Respect. 11) Customs and religions.                 |           |            |            |              |
| 1  |          | (UK)<br>Explain briefly the terms 'profession' and 'professional' with | 12 Marks  | 12         | CO1        | PO2          |
| ч. |          | suitable examples                                                      |           | LZ         | COI        | 102          |
|    |          |                                                                        |           |            |            |              |
| 5  | a)       | Define 'conscientiousness' with suitable case illustrations            | 6 Marka   | 12         | CO1        |              |
| 5. | a)<br>b) | Write short notes on the following :                                   | 6 Marks   | L2<br>L2   | $CO^{1}$   | PO2          |
|    | 0)       | i) Engineers as responsible experimenters.                             | 0 WILLING |            | 002        | 102          |
|    |          | ii) Moral autonomy and accountability.                                 |           |            |            |              |
|    |          | (OR)                                                                   |           |            |            |              |
| 6. |          | Discuss the necessary Industrial standards and code of ethics to       | 12 Marks  | L2         | CO1        | PO1          |
|    |          | be followed at workplace by engineers.                                 |           |            |            |              |
|    |          | (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)                                                                   | 1037.1    | <b>.</b> . | <b>a a</b> | <b>D O A</b> |
| 8. |          | Discuss the following:                                                 | 12 Marks  | L4         | CO2        | PO2          |
|    |          | 1) Professionalism.                                                    |           |            |            |              |
|    |          | 11) Moral Status.                                                      |           |            |            |              |
|    |          |                                                                        |           |            |            |              |
| 0  |          | Evenlain the nale of othics in MMC's and their rights                  | 12 Montra | т <b>э</b> | $CO^{2}$   |              |
| 9. |          | Explain the role of ethics in MINC's and their rights.                 | 12 Marks  | LZ         | COS        | PU8          |
| 10 |          | (UN)<br>Explain the following in detail with illustrations             | 12 Marke  | 12         | CO1        | P∩1          |
| 10 |          | i) Necessity of Moral leadership                                       | 12 mains  |            | 001        | 101          |
| •  |          | ii) Intellectual Property Rights.                                      |           |            |            |              |

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

#### SIGNALS AND SYSTEMS

[Electronics and Instrumentation Engineering]

| Ti | ime: 3 | hours                                                                                                              |           | Max. Marks: 60 |                     |      |  |
|----|--------|--------------------------------------------------------------------------------------------------------------------|-----------|----------------|---------------------|------|--|
|    |        | Answer One Question from each Unit<br>All questions carry equal marks                                              |           |                |                     |      |  |
|    |        | UNIT-I                                                                                                             |           |                |                     |      |  |
| 1. | a)     | Determine the value of power and energy of the following signals.                                                  | 6 Marks   | L1             | CO1                 | PO3  |  |
|    | h)     | i) $e^{-2t}$ <b>u</b> (t) ii) $\cos(\pi/4)$ n<br>Find the convolution of signals                                   | 6 Marks   | L1             | CO1                 | PO2  |  |
|    | 0)     | $x(n) = [\dots, 1, 1, 1, 1, 1, 0, 0, \dots]$ and $h(n) = a^n$ for $0 \le n \le 6$ and zero elsewhere               | 0 Willing | LI             | 001                 | 102  |  |
|    |        | (OR)                                                                                                               |           |                |                     |      |  |
| 2. | a)     | Which of the following signals are periodic? Find the fundamental period, if periodic.                             | 6 Marks   | L1             | CO1                 | PO2  |  |
|    | 1)     | 1) $3\cos(4t+\pi/3)$ 11) $\cos(\pi/8)n^2$                                                                          |           | т 1            | 001                 | DOO  |  |
|    | b)     | Find the response of an LTI system with input $x(n) = a^{"}u(n)$ and<br>impulse response $h(n) = u(n)$ .           | 6 Marks   | LI             | COI                 | PO2  |  |
| 2  | ``     |                                                                                                                    |           | <b>T O</b>     | <b>G</b> 0 <b>2</b> | DO 1 |  |
| 3. | a)     | periodic signals as a linear combination of harmonically related<br>complex exponentials                           | 6 Marks   | L2             | CO2                 | POI  |  |
|    | 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. (OR)                                                         | 6 Marks   | L3             | CO3                 | PO1  |  |
| 6. | a)     | Show that the power spectral density of the auto correlation function defined by                                   | 8 Marks   | L3             | CO3                 | PO4  |  |
|    |        | $R_{xx}(\tau) = 1 -  \tau   \text{for } -1 \le \tau \le 1$                                                         |           |                |                     |      |  |
|    |        | -0 Elsewhere                                                                                                       |           |                |                     |      |  |
|    | 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.                                              | 8 Marks   | L4             | CO4                 | PO2  |  |
|    |        | i) Impulse. ii) Unit Step. iii) ASin(ωt)u(t)                                                                       |           |                |                     |      |  |
|    |        | (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:                                                                      | 8 Marks | L4 | CO4 | PO5 |
|    |    | i) $X(S) = (s+2)/s^2 + 7s + 12$ ii) $X(S) = (s-3)/(s^2 + 4s + 13)$                                                        |         |    |     |     |
|    |    | 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                                                             | 8 Marks | L5 | CO5 | PO5 |
|    |    | for the following signals.                                                                                                |         |    |     |     |
|    |    | i) $x(t) = 2\operatorname{sinc}(100\pi t)$ ii) $x(t) = \operatorname{sinc}(80\pi t) \times \operatorname{sinc}(120\pi t)$ |         |    |     |     |
|    |    | (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 |

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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.<br>(OR)                                                                             | 6 Marks        | L1       | CO1      | PO2 |
| 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<br>identify various types of actors, use cases and their relationships<br>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 |
| 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 |
| 8             | a)            | Describe the concept of art of debugging with a neat diagram                                                                                     | 6 Marks        | L2       | CO4      | PO2 |
| 0.            | u)<br>b)      | Interpret about test cases and class hierarchy of object-oriented methods with an example                                                        | 6 Marks        | L2<br>L3 | CO4      | PO2 |
|               |               |                                                                                                                                                  |                |          |          |     |
| 0             | a)            | Discuss about risk mitigation monitoring and management                                                                                          | 6 Marks        | 13       | CO5      | PO5 |
| ).            | $\frac{a}{b}$ | Compare and contrast between McCall's quality factor and ISO                                                                                     | 6 Marks        |          | $CO_{5}$ | PO1 |
|               | 0)            | 9126 quality factor in Software Quality Factors.                                                                                                 | 0 marks        | 15       | 005      | 101 |
| 10            | a)            | Identify the steps for implementing business process                                                                                             | 6 Marks        | L2       | CO5      | PO2 |
| •             | b)            | reengineering model.<br>Illustrate about reverse engineering process to understand                                                               | 6 Marks        | L2       | CO5      | PO2 |
|               |               | internal design structure of complex systems.                                                                                                    |                |          |          |     |

CODE No.: 19BT31502

SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

Roll No.

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

# **OPERATING SYSTEMS**

[Information Technology]

| Ti | me: 3 | hours                                                       |          | Max | . Marks: | 60  |
|----|-------|-------------------------------------------------------------|----------|-----|----------|-----|
|    |       | Answer One Question from each Unit                          |          |     |          |     |
|    |       | All questions carry equal marks                             |          |     |          |     |
|    |       |                                                             |          |     |          |     |
| 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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#### 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. List and discuss types of precipitation briefly. 6 Marks L2 **PO1** a) CO1 b) Differentiate between recording and non-recording rain gauge 6 Marks L2 CO1 PO<sub>2</sub> and explain weighing bucket with a neat sketch. (OR)2. a) Explain mass curve and hyetograph with figure. 6 Marks L2 CO1 PO4 There are four rain gauge stations existing in the catchment of a 6 Marks L4 CO1 b) PO5 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. UNIT-II 3. a) Define infiltration and discuss different factors affecting 6 Marks L2 CO<sub>2</sub> **PO2** infiltration process. Discuss the following terms briefly. 6 Marks L2 CO2 b) **PO2** i) Hyetograph and ii) Double mass curve. (**OR**) A storm produced rainfall intensities of 7, 18, 25, 12, 10, and 4. a) 6 Marks L4 CO<sub>2</sub> PO5 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  $\Phi$  index of the basin. b) Discuss area velocity method to calculate discharge of stream. 6 Marks L2 CO<sub>2</sub> PO4 (UNIT-III) A 30cm well fully penetrates in an unconfined aquifer of 25m 6 Marks CO3 5. a) L4 PO<sub>2</sub> 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. Discuss briefly about ground water and different forms of 6 Marks L2 CO3 PO4 b) saturated formations in sub-surface of the earth. (**OR**) Derive an expression for discharge from a well fully penetrating 6. a) 6 Marks L4 CO3 PO5 a confined aquifer under steady state flow. 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 6 Marks L2 CO4 PO4 components.
  - b) Given the ordinates of a 4-h unit hydrograph as below. Derive 6 Marks L6 CO4 PO7 the ordinates of a 12-h unit hydrograph for the same catchment using method of superposition.

| 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  |

efficiency in reservoir.

#### (OR)

- 8. a) Describe the most commonly used two methods for routing of 6 Marks L4 CO5 PO2 floods through reservoir and differentiate channel routing and reservoir routing.
  b) Discuss rational methods for estimation of peak discharge for a 6 Marks L2 CO5 PO4
  - watershed.

# UNIT-V

| 9. | a) | Discuss about reservoir sedimentation and different measure to     | 6 Marks | L2 | CO6 | PO2 |
|----|----|--------------------------------------------------------------------|---------|----|-----|-----|
|    |    | control sedimentation.                                             |         |    |     |     |
|    | b) | Distinguish universal soil loss equation and modified universal    | 6 Marks | L2 | CO6 | PO4 |
|    |    | soil loss equation for the estimation of soil erosion.             |         |    |     |     |
|    |    | (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 | 6 Marks | L2 | CO6 | PO7 |

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# ENVIRONMENTAL ENGINEERING

[ Civil Engineering ]

| Ti | me: 3    | hours                                                                                                                                                                                                                                                                                                                                                                 |                    | Max      | 60         |                                                |
|----|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------|------------|------------------------------------------------|
|    |          | Answer One Question from each Unit<br>All questions carry equal marks                                                                                                                                                                                                                                                                                                 |                    |          |            |                                                |
|    |          |                                                                                                                                                                                                                                                                                                                                                                       |                    |          |            |                                                |
| 1. | a)<br>b) | Draw a typical reservoir intake and describe various parts.<br>Compute the population using arithmetic, geometric and<br>incremental increase methods for the decades 2031 and 2041, if a<br>town had the population 1,20,000; 2,10,000; 2,70,000; 3,20,000;<br>and 4,10,000 at the end of 1981, 1991, 2001, 2011 and 2021<br>respectively as per the census records. | 6 Marks<br>6 Marks | L1<br>L3 | CO1<br>CO1 | PO1<br>PO1<br>PO2<br>PO3<br>PO4<br>PO5         |
| 2. | a)       | Describe biological characteristics of surface and subsurface water sources                                                                                                                                                                                                                                                                                           | 6 Marks            | L2       | CO1        | PO1<br>PO2                                     |
|    | b)       | What are points should be kept in mind while selecting a site for intake structure?                                                                                                                                                                                                                                                                                   | 6 Marks            | L2       | CO1        | PO1<br>PO2<br>PO7                              |
|    |          |                                                                                                                                                                                                                                                                                                                                                                       |                    |          |            | 107                                            |
| 3. | a)       | Prove that the settling of particles is independent of depth of sedimentation tank.                                                                                                                                                                                                                                                                                   | 6 Marks            | L4       | CO2        | PO1<br>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<br>PO2<br>PO3<br>PO4<br>PO6<br>PO8<br>PO10 |
| 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<br>PO2<br>PO3<br>PO4<br>PO6<br>PO8         |
|    | b)       | Design rapid sand filter for treating 1.0 MLD water. Assume filtration rate as $2500 \text{ L/m}^2/\text{hr}$ .                                                                                                                                                                                                                                                       | 6 Marks            | L4       | CO2        | PO1<br>PO2<br>PO4<br>PO6<br>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<br>flow in sewers. Explain their applicability or suitability.<br>(OR)                                                                                                                                                                                                                                | 6 Marks            | L2       | CO3        | PO1<br>PO2                                     |

| 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<br>PO2<br>PO5                                     |
|----|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----|-----|-------------------------------------------------------|
|    | b) | A 300mm diameter sewer is to flow at 0.3 depth on a grade<br>ensuring a degree of self cleansing equivalent to that obtained at<br>full depth at a velocity of 0.9 m/sec. Find the required grade and<br>associated velocity and rate of discharge at this depth. Assume<br>Manning's rugosity coefficient $n = 0.013$ . The variation of <b>n</b> with<br>depth may be neglected.       | 6 Marks | L3 | CO3 | PO6<br>PO1<br>PO2<br>PO4<br>PO5<br>PO6<br>PO8         |
| 7. | a) | Explain design criteria of construction operation of UASB process.                                                                                                                                                                                                                                                                                                                       | 6 Marks | L2 | CO4 | PO1<br>PO2<br>PO5<br>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. <b>(OR)</b> | 6 Marks | L2 | CO4 | PO1<br>PO2<br>PO5<br>PO10<br>PO12                     |
| 8. | a) | Explain sludge digestion and its stages in digestion process. Also                                                                                                                                                                                                                                                                                                                       | 6 Marks | L2 | CO4 | PO1<br>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 | PO2<br>PO1<br>PO2<br>PO3<br>PO5<br>PO6<br>PO8<br>PO10 |
| 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<br>PO2<br>PO3<br>PO5<br>PO6<br>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<br>PO2<br>PO10                                    |
| 10 | a) | (OR)<br>What is the purpose of sludge digestion in sewage treatment?<br>Describe various stages of sludge digestion in an anaerobic<br>digester and the characteristic and final method of disposal of the<br>digested sludge.                                                                                                                                                           | 6 Marks | L2 | CO5 | PO1<br>PO2<br>PO5<br>PO6                              |
|    | b) | What are different methods for solid waste collection and disposal? Explain clearly.                                                                                                                                                                                                                                                                                                     | 6 Marks | L6 | CO5 | PO1<br>PO2<br>PO4<br>PO5<br>PO6<br>PO8                |

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#### HYDRAULIC ENGINEERING

[ Civil Engineering ]

| Ti | Time: 3 hours |                                                                                                                                                                                                                                                                                                                               |                    |          |            |                   |  |
|----|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------|------------|-------------------|--|
|    |               | Answer One Question from each Unit<br>All questions carry equal marks                                                                                                                                                                                                                                                         |                    |          |            |                   |  |
|    |               | UNIT-I                                                                                                                                                                                                                                                                                                                        |                    |          |            |                   |  |
| 1. | a)<br>b)      | Describe boundary layer concept.<br>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 <sup>2</sup> /s. The fluid is moving with a velocity of 6 m/s. Determine the boundary layer thickness.                                                       | 6 Marks<br>6 Marks | L1<br>L4 | CO1<br>CO1 | PO1<br>PO1<br>PO2 |  |
| 2  | ``            | (OR)                                                                                                                                                                                                                                                                                                                          |                    | т о      | 001        | DO 1              |  |
| 2. | a)<br>b)      | Explain boundary conditions for the velocity profiles.<br>Derive equation for momentum thickness.                                                                                                                                                                                                                             | 6 Marks<br>6 Marks | L2<br>L3 | CO1<br>CO1 | PO1<br>PO1<br>PO2 |  |
|    |               | UNIT-II)                                                                                                                                                                                                                                                                                                                      |                    |          |            |                   |  |
| 3. | a)<br>b)      | Describe specific energy with diagram.<br>Water flow in a wide rectangular channel of concrete ( $n = 0.014$ )<br>laid at a slope of 1 in 900. Determine the depth of flow and the<br>unit discharge for the flow to take place in critical condition.                                                                        | 6 Marks<br>6 Marks | L1<br>L4 | CO2<br>CO2 | PO1<br>PO1<br>PO2 |  |
| 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<br>PO2        |  |
|    |               | UNIT-III)                                                                                                                                                                                                                                                                                                                     |                    |          |            |                   |  |
| 5. | a)<br>b)      | Describe the force exerted by a jet on stationary inclined plate.<br>A jet of water of diameter 10cm strikes a flat plate normally with<br>a velocity of 15 m/s. The plate is moving with a velocity of 6 m/s<br>in the direction of the jet and away from the jet. Find the work<br>done by the jet on the plate per second. | 6 Marks<br>6 Marks | L1<br>L4 | CO3<br>CO3 | PO1<br>PO1<br>PO2 |  |
| 6  | a)            | (UR)<br>Explain the force exerted by a jet of water on series of vanes                                                                                                                                                                                                                                                        | 6 Marka            | 12       | $CO^{2}$   |                   |  |
| 0. | a)<br>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°. Find the force exerted by the jet on the plate in the direction normal to the plate.                                                                                    | 6 Marks            | L2<br>L3 | CO3        | PO1<br>PO2        |  |
| 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 $1.5 \text{ m/s}$ . Determine the discharge through the runner, and width of the turbine at outlet if the width of the turbine at inlet = 200mm. (OR)     | 6 Marks            | L4       | CO4        | PO1<br>PO2        |  |
| 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<br>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                     | 6 Marks | L4 | CO5 | PO1 |
|    |    | 0.03 m <sup>3</sup> /s of water against a total head of 20m is 0.40m. The    |         |    |     | PO2 |
|    |    | pump is running at 1500 r.p.m. Find the head, discharge for a                |         |    |     | PO3 |
|    |    | geometrically similar pump of diameter 0.25m when it is running              |         |    |     |     |
|    |    | at 3000 r.p.m.                                                               |         |    |     |     |
|    |    | (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 |

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Roll No.

<u>SVEC-1</u>9

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 ]

|               |    | [ Civit Engineering ]                                                                                                                                                                                                                                                                       |         |           |     |                   |
|---------------|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------|-----|-------------------|
| Time: 3 hours |    | hours<br>Answer One Question from each Unit<br>All questions carry equal marks                                                                                                                                                                                                              |         | Max. Mark |     |                   |
|               |    |                                                                                                                                                                                                                                                                                             |         |           |     |                   |
| 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<br>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<br>PO2        |
|               |    | (OR)                                                                                                                                                                                                                                                                                        |         |           |     |                   |
| 2.            | a) | In its natural condition, a soil sample has a mass of 1.980 kg and a volume of $0.001 \text{ m}^3$ . 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 <sup>3</sup> . What is the degree of saturation? | 6 Marks | L3        | CO1 | PO1<br>PO2<br>PO8 |
|               | b) | The laboratory test results of a soil sample are given below:<br>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<br>PO2        |
|               |    | UNIT-II                                                                                                                                                                                                                                                                                     |         |           |     |                   |
| 3.            | a) | A soil has a discharge velocity of 3 $\times 10^{-7}$ 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<br>permeameter equal time intervals are noted for a drop of head<br>from $L_1$ and $L_2$ and against $L_2$ and $L_3$ . What will be the relation<br>between $L_1$ , $L_2$ , and $L_3$ ?                                  | 6 Marks | L4        | CO2 | PO1<br>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 <sup>3</sup> /sec, then what is the coefficient of permeability of dam material?                                                | 6 Marks | L2        | CO2 | PO1<br>PO2<br>PO8 |
|               | b) | A soil deposit has three layers having same thickness each but<br>the permeability of the layers is in the ratio of 1:2:4 from top to<br>bottom. What is the ratio of average permeability in the<br>horizontal direction to that in the vertical direction?                                | 6 Marks | L3        | CO2 | PO1<br>PO2        |
| 5.            | a) | A vertical concentrated force of 40 kN is acting at a point on the                                                                                                                                                                                                                          | 6 Marks | L2        | CO3 | PO1               |
|               | ,  | ground surface. Determine the vertical stress intensities due to<br>this load at a depth of 2.5m below GL on the line of action of<br>load and at a depth of 1.5m below GL and a radial distance of<br>3m.                                                                                  |         |           |     | PO2<br>PO4        |
|               | b) | A rectangular footing with dimensions of $2mx3m$ has to carry a uniformly distributed load of $100 \text{ kN/m}^2$ . 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<br>PO2<br>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<br>PO2                      |
| 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 <sup>3</sup> and the density of clay is $17 \text{ kN/m}^3$ .                                                                                                          | 6 Marks | L3 | CO3 | PO1<br>PO2<br>PO10              |
|    | b) | A laboratory compaction test on soil having specific gravity<br>equal to 2.67 gave a maximum dry unit weight of 17.8 kN/m <sup>3</sup><br>and a water content of 15%. Determine the degree of saturation,<br>air content and percentage air voids at the maximum dry unit<br>weight. What would be theoretical maximum dry unit weight<br>corresponding to zero air voids at the optimum water content?<br>(OR)                                                                                                             | 6 Marks | L4 | CO3 | PO1<br>PO2<br>PO4<br>PO6        |
| 8. | a) | There is a bed of compressible clay of 4m thickness with<br>pervious sand on top and impervious rock at the bottom. In a<br>consolidation test in the laboratory on an undisturbed specimen<br>of clay from this deposit, 90% settlement was reached in 4 hours.<br>The specimen was 20mm thick. Estimate the time in years for the<br>building founded over this deposit to reach 90% of its final<br>settlement                                                                                                           | 6 Marks | L4 | CO3 | PO1<br>PO2<br>PO5<br>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<br>PO2                      |
| 9. | a) | In a triaxial shear test conducted on a soil sample having a cohesion of $12 \text{ kN/m}^2$ and angle of shearing resistance of $36^\circ$ , the cell pressure was 200 kN/m <sup>2</sup> . Determine the value of the deviator stress at failure                                                                                                                                                                                                                                                                           | 6 Marks | L3 | CO4 | PO1<br>PO2                      |
|    | b) | Two drained triaxial tests are performed on the material. In the first test the all-round pressure is $200 \text{ kN/m}^2$ and failure occurs at an added axial stress of $600 \text{ kN/m}^2$ . In the second test all-round pressure is $350 \text{ kN/m}^2$ and failure occurs at an added axial stress of $1050 \text{ kN/m}^2$ . What values of <b>c'</b> and <b>ø</b> ' correspond to these results?                                                                                                                  | 6 Marks | L3 | CO4 | PO1<br>PO2<br>PO4               |
| 10 | a) | Differentiate the Consolidated Drained and Consolidated                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 6 Marks | L1 | CO4 | PO1                             |
|    | b) | Undrained Triaxial test, with respect to field conditions.<br>Calculate the potential shear strength on a horizontal plane at a<br>depth of 3m below the surface in a formation of cohesionless soil<br>when the water table is at a depth of 3.5m. The degree of<br>saturation may be taken as 0.5 on the average. Void ratio = 0.50;<br>grain specific gravity = 2.70; angle of internal friction = $30^{\circ}$ .<br>What will be the modified value of shear strength if the water<br>table reaches the ground surface? | 6 Marks | L4 | CO4 | PO2<br>PO1<br>PO2<br>PO4<br>PO5 |

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Time: 3 hours

SVEC-19 Roll No.

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### STRUCTURAL ANALYSIS

#### [Civil Engineering]

Max. Marks: 60

PO4 PO5 PO10

PO1

PO2 PO4

PO5 PO10

CO2

L4

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

| 1. | a) | Determine the ratio of deflections Y1:Y2 of a simply supported<br>beam carrying a concentrated load W at mid-span deflects by<br>'Y1' under the load. If the same beam carries the load W such that<br>it is distributed uniformly over entire length and undergoes a<br>deflection Y2 at the mid span                                                                         | 4 Marks | L3 | CO1 | PO1<br>PO2<br>PO4<br>PO5<br>PO10 |
|----|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----|-----|----------------------------------|
|    | b) | A Cantilever beam of 3m span is 150mm wide and 250mm deep.<br>It carries an UDL of 20 kN/m over its whole span and 25 kN at<br>the free end. Calculate the maximum slope and deflection. Take<br>$E = 2 \times 10^5 \text{ N/mm}^2$ . Use Moment-area method.                                                                                                                  | 8 Marks | L4 | CO1 | PO1<br>PO2<br>PO4<br>PO5<br>PO10 |
|    |    | (OR)                                                                                                                                                                                                                                                                                                                                                                           |         |    |     |                                  |
| 2. | a) | Determine the mid span deflection of simply supported beam<br>with concentrated load 'W' at mid span by Double Integration<br>method.                                                                                                                                                                                                                                          | 4 Marks | L3 | CO1 | PO1<br>PO2<br>PO4<br>PO5<br>PO10 |
|    | b) | A beam of uniform section 10m long is simply supported at its<br>ends. It carries Point loads of 100 kN and 60 kN at a distance of<br>2m and 5m respectively from the left end. Calculate:<br>i) The deflection under each load.<br>ii) The maximum deflection. Using Macaulay's method.<br>$E = 200 \times 10^{6} \text{ N/m}^{2}$ and $I = 118 \times 10^{-4} \text{ m}^{4}$ | 8 Marks | L4 | CO1 | PO1<br>PO2<br>PO4<br>PO5<br>PO10 |
|    |    |                                                                                                                                                                                                                                                                                                                                                                                |         |    |     |                                  |

- 3. a) Using strain energy method, determine the deflection of the free 4 Marks L4 CO2 PO1 end of a cantilever of length 'L' subjected to an UDL. PO2
  - b) Find the horizontal deflection at joint C of the pin-jointed frame 8 Marks as shown in Fig. 1. AE is constant for all members.



UN

Draw shear force and bending moment diagrams for the fixed 12 Marks L4 CO2 PO1 beam shown in Fig. 2. Take w = 20 kN/m and L = 10 m. PO2

PO4 PO5 PO10

PO5 PO10

PO4

PO5

**PO10** 

PO4

PO5 PO10



4.

6.

5. Analyze the continuous beam as shown in the Fig. 3 by three 12 Marks L4 CO3 PO1 moment equation theorem. E is constant. Draw the BMD. PO2 40 kN 50 kN PO4



(OR)

Analyze the continuous beam shown in Fig. 4 by slope deflection 12 Marks L4 CO3 PO1 method and draw the bending moment diagram. 100 kN PO4 PO5 PO10 45m



7. Analyze the continuous beam as shown in Fig. 5 by moment 12 Marks L4 CO4 PO1 distribution method. Draw the bending moment diagram. PO2



8. Analyse the continuous beam shown in Fig. 6 by Kani's method. 12 Marks L4 CO4 PO1 Draw BMD. PO2


## UNIT-V

- 9. A system of four loads 80kN, 160kN, 160kN and 120kN crosses 12 Marks L4 CO5 PO1 a simply supported beam of span 25m with the 120kN load **PO2** leading. The loads are equally spaced at 1m. Determine the PO4 values of the maximum bending moment and shear force at a PO5 section 10m from left support and absolute maximum shear force **PO10** and bending moment in the beam uniform ILD. Use Influence Lines method.
- (OR) 10 a) Determine the shape factor for the T-section shown in Fig. 7. 4 Marks L4 CO5 PO1 . PO2



b) Calculate the plastic moment capacity required for the 8 Marks L4 CO5 PO1 continuous beam with working loads shown in Fig. 8. PO2

|    |       | 20 kN | 15 kN | I I   |   | PO4  |
|----|-------|-------|-------|-------|---|------|
| ₿A | В     |       | с     | ↓ D   | E | PO5  |
| Ű  | 4     | 4.    | XIXI  | M.    | 8 | PO6  |
| ]  | 2.0 m | 2.0 m | 2.0 m | 2.0 m |   | PO10 |
| Ţ  | 4     | .0 m  | 4.    | 0 m   |   |      |



| C  | ODE N     | No.: 19BT40106                                                                                                | . <u> </u>          |        | SV       | E <b>C-19</b>     |
|----|-----------|---------------------------------------------------------------------------------------------------------------|---------------------|--------|----------|-------------------|
|    |           | Roll No                                                                                                       | •                   |        |          |                   |
|    |           | SREE VIDYANIKETHAN ENGINEERING COU<br>(An Autonomous Institution, Affiliated to JNTUA, Ananthapura            | <b>LEGE</b><br>amu) |        |          |                   |
|    |           | II B.Tech II Semester (SVEC-19) Regular Examination                                                           | s August -          | - 2021 |          |                   |
|    |           | DISASTER MITIGATION AND MANAGEM                                                                               | ENT                 |        |          |                   |
|    |           | [ Civil Engineering, Mechanical Engineering, Computer Scien                                                   | ce and Eng          | ineeri | ng,      |                   |
|    |           | Information Technology, Computer Science and System                                                           | s Engineeri         | ing]   |          |                   |
| Ti | ime: 3    | hours                                                                                                         |                     | Max    | . Marks: | 60                |
|    |           | Answer One Question from each Unit                                                                            |                     |        |          |                   |
|    |           |                                                                                                               |                     |        |          |                   |
|    |           | UNIT-I                                                                                                        |                     |        |          |                   |
| 1. | a)        | Write an account on the impact of disasters on life and environment.                                          | 6 Marks             | L2     | CO1      | PO1<br>PO2        |
|    |           |                                                                                                               |                     |        |          | PO6               |
|    | b)        | Explain how the public awareness is helpful in risk reduction.                                                | 6 Marks             | L2     | CO1      | PO7<br>PO1        |
|    | -)        | r                                                                                                             |                     |        |          | PO2               |
|    |           |                                                                                                               |                     |        |          | PO7               |
| 2  | a)        | (OR)<br>Explain about Hazard Assessment                                                                       | 6 Marks             | 12     | CO1      |                   |
| 4. | <i>a)</i> | Explain about mazaru Assessment.                                                                              | 0 Iviaiks           | LZ     | COI      | PO2               |
|    |           |                                                                                                               |                     |        |          | PO6               |
|    | 1 \       |                                                                                                               |                     | 1.0    | 001      | PO7               |
|    | b)        | Explain about basic principles and elements of disaster mitigation.                                           | 6 Marks             | L2     | COI      | PO1<br>PO2<br>PO7 |
|    |           |                                                                                                               |                     |        |          | 107               |
| 3. | a)        | Give adverse effects of tsunami. Also discuss the tsunami                                                     | 6 Marks             | L2     | CO2      | PO1               |
|    | ,         | mitigation measures.                                                                                          |                     |        |          | PO2               |
|    | 1 \       |                                                                                                               |                     | т 4    | 000      | PO4               |
|    | b)        | Distinguish between active control and passive control systems.<br>Draw the block diagram of both the systems | 6 Marks             | L4     | 02       | PO1<br>PO2        |
|    |           |                                                                                                               |                     |        |          | PO5               |
|    |           |                                                                                                               |                     |        |          | PO10              |
| 4  | 2)        | (OR)                                                                                                          | 6 Mortes            | 1.2    | cor      |                   |
| 4. | a)        | view of earth quakes.                                                                                         | o Marks             | LZ     | 002      | PO1<br>PO2        |
|    | b)        | Consider a worst affected Earthquake hazard and what was                                                      | 6 Marks             | L5     | CO2      | PO1               |
|    |           | government role in its remedial measures?                                                                     |                     |        |          | PO2               |
|    |           |                                                                                                               |                     |        |          | PO3               |
|    |           |                                                                                                               |                     |        |          | FOO               |
| 5  | a)        | Explain the necessary steps to be taken to avoid dangerous                                                    | 6 Marks             | L4     | CO3      | PO1               |
| 0. | u)        | epidemics after a flood disaster.                                                                             | 0 101001110         | 2.     | 005      | PO2               |
|    |           |                                                                                                               |                     |        |          | PO4               |
|    | b)        | Write a short note on the drought control measures adopted                                                    | 6 Marks             | 12     | CO3      | PO6<br>PO1        |
|    | 0)        | across the globe.                                                                                             | U IVIAIKS           | LZ     | 005      | PO2               |
|    |           |                                                                                                               |                     |        |          | PO4               |
|    |           |                                                                                                               |                     |        |          | PO7               |

| 6. | a)       | Discuss the consequences of natural disasters in Urban areas in view of i) cyclones ii) floods.                      | 6 Marks            | L2       | CO3        | PO1<br>PO2                 |
|----|----------|----------------------------------------------------------------------------------------------------------------------|--------------------|----------|------------|----------------------------|
|    | b)       | Explain the disaster flood with the help of a case study.                                                            | 6 Marks            | L4       | CO3        | PO7<br>PO1<br>PO2<br>PO4   |
|    |          |                                                                                                                      |                    |          |            | 101                        |
| 7. | a)       | Explain briefly different causes for landslides.                                                                     | 6 Marks            | L4       | CO4        | PO1<br>PO2                 |
|    | b)       | Discuss the types of landslides.                                                                                     | 6 Marks            | L2       | CO4        | PO1<br>PO2                 |
|    |          | (OR)                                                                                                                 |                    |          |            |                            |
| 8. | a)<br>b) | Discuss the consequences of the natural disaster landslide.<br>Discuss the various methods of preventing landslides. | 6 Marks<br>6 Marks | L2<br>L4 | CO4<br>CO4 | PO1<br>PO1<br>PO2<br>PO4   |
|    |          |                                                                                                                      |                    |          |            |                            |
| 9. | a)       | Explain cost-benefit analysis with respect to various disaster management programs.                                  | 6 Marks            | L4       | CO5        | PO1<br>PO2                 |
|    | b)       | Discuss about a few emerging trends in disaster management.                                                          | 6 Marks            | L2       | CO5        | PO1<br>PO2<br>PO5          |
|    |          | (OR)                                                                                                                 |                    |          |            | r012                       |
| 10 | a)       | Discuss the role of knowledge based expert system in disaster Management.                                            | 6 Marks            | L3       | CO5        | PO1<br>PO2<br>PO10<br>PO11 |
|    | b)       | Discuss the various functions of disaster mitigation organization.                                                   | 6 Marks            | L4       | CO5        | PO1<br>PO2<br>PO5<br>PO11  |
|    |          |                                                                                                                      |                    |          |            |                            |

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Roll No.

SVEC-19

#### **SREE VIDYANIKETHAN ENGINEERING COLLEGE**

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### SUSTAINABLE ENGINEERING

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

| T  | Time: 3 hours |                                                                                                       |         |     |     |            |  |  |
|----|---------------|-------------------------------------------------------------------------------------------------------|---------|-----|-----|------------|--|--|
|    |               | Answer One Question from each Unit<br>All questions carry equal marks                                 |         |     |     |            |  |  |
|    |               | UNIT-I                                                                                                |         |     |     |            |  |  |
| 1. | a)            | What are the essential components of sustainability?                                                  | 6 Marks | L1  | CO1 | PO1<br>PO2 |  |  |
|    | b)            | Illustrate the three-pillar model of sustainability.                                                  | 6 Marks | L3  | CO1 | PO4        |  |  |
|    |               | $(\mathbf{OR})$                                                                                       |         |     |     | PU0        |  |  |
| 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<br>PO6 |  |  |
|    |               | UNIT-II)                                                                                              |         |     |     |            |  |  |
| 3. | a)            | Give the list of important activities that can reduce carbon                                          | 6 Marks | L3  | CO2 | PO5<br>PO6 |  |  |
|    | b)            | What is environmental management system and list out the                                              | 6 Marks | L2  | CO2 | PO1        |  |  |
|    |               | functions of EMS?                                                                                     |         |     |     | PO/        |  |  |
| 4. | a)            | How does economic input output-life cycle analysis help to<br>achieve sustainability? Explain         | 6 Marks | L1  | CO2 | PO1<br>PO2 |  |  |
|    | b)            | What are the steps involved in the environmental health risk                                          | 6 Marks | L4  | CO2 | PO6<br>PO7 |  |  |
|    |               |                                                                                                       |         |     |     | 107        |  |  |
| 5  | a)            | Compare and contrast conventional and nonconventional energy                                          | 6 Marks | 1.3 | CO3 | PO1        |  |  |
| 5. | u)            | with reference to sustainability.                                                                     | 0 Marks | 15  | 005 | 101        |  |  |
|    | b)            | Categorize the various energy sources in the increasing order of<br>their carbon footprint            | 6 Marks | L4  | CO3 | PO1        |  |  |
|    |               | (OR)                                                                                                  |         |     |     |            |  |  |
| 6. | a)            | Compare the feasibility of different sources of renewable energy<br>with current scenario.            | 6 Marks | L5  | CO3 | PO1        |  |  |
|    | b)            | Is there a best energy source that will have the minimum                                              | 6 Marks | L6  | CO3 | PO1        |  |  |
|    |               | environmental impact? Justify your answer.                                                            |         |     |     |            |  |  |
|    |               | (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<br>PO2<br>PO4<br>PO6 |
|    |    | (OR)                                                                                                          |         |    |     |                          |
| 10 | a) | Give any three examples of air pollutants and their effect on<br>human health and explain control techniques. | 6 Marks | L5 | CO5 | PO2<br>PO4<br>PO5        |
|    | b) | What are the main causes of urbanization? Discuss.                                                            | 6 Marks | L3 | CO5 | PO5<br>PO6<br>PO8        |

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CODE No.: 19BT40201

SVEC-19

## SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### **DIGITAL ELECTRONICS**

[Electrical and Electronics Engineering]

| Ti | Max                             | 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<br>of sums for $\mathbf{f} = \mathbf{b'c'd'} + \mathbf{bcd} + \mathbf{acd'} + \mathbf{ab'bc'd}$ .            | 6 Marks | L3 | CO1 | PO2 |  |  |  |  |  |  |  |
|    | b)                              | Simplify the following function using K-map $F(A,B,C,D)=\sum(0,1,2,3,4,6,9,10)+d(7,11,12,13,15)$                                                                       | 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 |  |  |  |  |  |  |  |
|    |                                 |                                                                                                                                                                        |         |    |     |     |  |  |  |  |  |  |  |
| 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 $f(A,B,C,D)=\sum m(1,3,4,6,7,9,10,11,14)$ .                                                   | 6 Marks | L2 | CO2 | PO5 |  |  |  |  |  |  |  |
| 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 |  |  |  |  |  |  |  |
|    |                                 |                                                                                                                                                                        |         |    |     |     |  |  |  |  |  |  |  |
| 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 $4 \rightarrow 6 \rightarrow 7 \rightarrow 3 \rightarrow 1 \rightarrow 4$ | 6 Marks | L3 | CO3 | PO3 |  |  |  |  |  |  |  |
|    | b)                              | Design Mod-9 counter using D flip-flop                                                                                                                                 | 6 Marks | L2 | CO3 | PO5 |  |  |  |  |  |  |  |
|    |                                 |                                                                                                                                                                        |         |    |     |     |  |  |  |  |  |  |  |
| 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)= $\Sigma_m(2,4,5,6)$ using Hazard Free logic gate network.                                                                    | 8 Marks | L2 | CO4 | CO4 |  |  |  |  |  |  |  |
|    |                                 |                                                                                                                                                                        |         |    |     |     |  |  |  |  |  |  |  |

(OR)

Minimize the sequential machine represented in the state table 8. 8 Marks CO4 PO5 a) L2 Minimize the sequences and shown below using merger table. Table

|    |    |                     |               | Table        |              | _                |         |    |     |     |
|----|----|---------------------|---------------|--------------|--------------|------------------|---------|----|-----|-----|
|    |    |                     | Present       | Next S       | tate , Z     |                  |         |    |     |     |
|    |    |                     | State         | X=0          | X=1          |                  |         |    |     |     |
|    |    |                     | А             | B,1          | H,1          |                  |         |    |     |     |
|    |    |                     | В             | F,1          | D,1          |                  |         |    |     |     |
|    |    |                     | С             | D,0          | E,1          |                  |         |    |     |     |
|    |    |                     | D             | С,0          | E,1          |                  |         |    |     |     |
|    |    |                     | Е             | D,1          | C,1          |                  |         |    |     |     |
|    |    |                     | F             | C,1          | C,1          |                  |         |    |     |     |
|    |    |                     | G             | C,1          | D,1          |                  |         |    |     |     |
|    |    |                     | Н             | С,0          | A,1          |                  |         |    |     |     |
|    | b) | Explain finite sta  | te machine    | S.           |              | -                | 4 Marks | L1 | CO4 | PO1 |
|    |    |                     |               | (            | UNIT-        | $\mathbf{v}$     |         |    |     |     |
| 9. | a) | What are program    | nmable log    | ic devices?  | ? Explain t  | them in brief.   | 6 Marks | L1 | CO5 | PO1 |
|    | b) | Draw the logic d    | liagram for   | implemen     | tation of 1  | 16 x 8 ROM and   | 6 Marks | L2 | CO5 | PO1 |
|    |    | explain its archite | ecture.       | -            |              |                  |         |    |     |     |
|    |    |                     |               |              | (OR)         |                  |         |    |     |     |
| 10 | a) | Design using PA     | L the follow  | ving Boole   | ean function | ons.             | 6 Marks | L2 | CO5 | PO1 |
|    |    | W(A,B,C,D)=(2,      | 12,13)        |              |              |                  |         |    |     |     |
|    |    | X(A,B,C,D)=(7,8     | 8,9,10,11,12  | 2,13,14,15   | )            |                  |         |    |     |     |
|    |    | Y(A,B,C,D)=(0,2)    | 2,3,4,5,6,7,8 | 8,10,11,15   | )            |                  |         |    |     |     |
|    | b) | Briefly explain th  | ne binary m   | ultiplicatio | on and divi  | ision algorithm. | 6 Marks | L2 | CO5 | PO1 |
|    |    |                     |               |              |              |                  |         |    |     |     |

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(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### **ELECTRICAL MACHINES-II**

#### [Electrical and Electronics Engineering]

| Т  | Time: 3 hours Answer One Question from each Unit |                                                                                                                                                                                                                                                                                                                                  |         |          | Max. Marks: 60 |     |  |
|----|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------|----------------|-----|--|
|    |                                                  | All questions carry equal marks                                                                                                                                                                                                                                                                                                  |         |          |                |     |  |
|    |                                                  |                                                                                                                                                                                                                                                                                                                                  |         |          |                |     |  |
| 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<br>of 120V across slip rings on open circuit, when at rest and<br>supplied with normal supply voltage. The rotor impedance per<br>phase is $0.3 + j1.5\Omega$ . Find the rotor current and torque when<br>machine is running at 5 % slip.                      | 6 Marks | L3       | CO1            | PO4 |  |
| _  |                                                  | (OR)                                                                                                                                                                                                                                                                                                                             |         |          |                |     |  |
| 2. | a)<br>b)                                         | Explain Torque-Slip characteristics of Induction motor.<br>If an 8-pole induction motor running from a supply of 50HZ has                                                                                                                                                                                                        | 8 Marks | L1       | COl            | PO1 |  |
|    |                                                  | an <b>emf</b> in the rotor of frequency 1.5HZ, compute the slip and speed of the motor.                                                                                                                                                                                                                                          | 4 Marks | L2       | COI            | PO5 |  |
|    |                                                  |                                                                                                                                                                                                                                                                                                                                  |         |          |                |     |  |
| 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<br>wound rotor. The rotor <b>emf</b> is 50V between the slip rings at<br>standstill. The rotor resistance and standstill reactance are $0.4\Omega$<br>and $2.0\Omega$ respectively. Calculate:<br>i) Rotor current per phase at starting when slip rings are short | 8 Marks | L3       | CO1            | PO4 |  |
|    |                                                  | <ul> <li>circuited.</li> <li>ii) Rotor current per phase at starting if 50Ω per phase resistance is connected between slip rings.</li> <li>iii) Rotor emf when the motor us running at full load at 1440 r.p.m.</li> <li>iv) Rotor current at full load and Rotor power factor at full load</li> </ul>                           |         |          |                |     |  |
| 1  | a)                                               | (UR)<br>Explain the principle of induction generator operation                                                                                                                                                                                                                                                                   | 6 Marks | T 1      | CO1            | PO1 |  |
| 4. | a)<br>b)                                         | Discuss in detail about Crawling and Cogging.                                                                                                                                                                                                                                                                                    | 6 Marks | L1<br>L2 | C01            | 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. Explain the principle of operation of a synchronous generator. a)
  - A 220V, 50Hz, 6-pole star-connected alternator with ohmic b) resistance of  $0.06\Omega$  per phase are the following data for open circuit and full load ZPF characteristics:

| Field<br>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<br>Voltage<br>(Volts) | 29.0 | 58.0 | 87.0 | 116 | 146  | 172 | 194 | 232 | 261.5 | 284 | 300 | 310 |
| ZPF voltage<br>(Volts)             | -    | -    | -    | -   | -    | 0   | 29  | 88  | 140   | 177 | 208 | 230 |

6 Marks L1 CO2 PO1

6 Marks L3 CO2 PO4

L3

CO3

PO1

**PO7** 

Find the percentage voltage regulation at full load current of 40Amps at power factor of 0.8 lagging.

#### UNIT-IV)

- 7. Derive an expression for synchronizing torque when a 3-phase a) 6 Marks L2 CO3 alternator is connected to infinite bus-bar.
  - 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 6 Marks adjusted to 0.92 lag. Find the Power Factor of alternator B.
    - 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<br>synchronous motor has a resistance and synchronous reactance<br>of $0.04\Omega$ and $0.4\Omega$ respectively. Compute for full load 0.8pf<br>lead the open circuit <b>emf</b> per phase and gross mechanical<br>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 |

ନ୍ଦ୍ରେ <del>(</del>) ණි Time: 3 hours

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

Roll No.

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### **ELECTRICAL MEASUREMENTS**

[ Electrical and Electronics Engineering ]

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<br>and how are they classified.                                                                                                                                                                                                                                                                        | 6 Marks | L2         | CO1        | PO1                 |
|    |    | (OR)                                                                                                                                                                                                                                                                                                                                                                |         |            |            |                     |
| 2. | a) | Explain the construction details of attraction type moving iron<br>instrument. Derive the Torque equation for moving iron<br>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 $\Omega$ and galvanometer has a resistance of 2000 $\Omega$ . Determine the multiplying power of shunt for 1000 $\Omega$ , 2000 $\Omega$ and 3000 $\Omega$ tapping.                                                                                                                                       | 6 Marks | L3         | CO1        | PO2                 |
| 3. | a) | Explain with a neat circuit of single phase Dynamometer type<br>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<br>a wattmeter and compare the errors.                                                                                                                                                                                                                                                             | 6 Marks | L2         | CO2        | PO4                 |
|    | `` | (OR)                                                                                                                                                                                                                                                                                                                                                                |         | <b>T A</b> | <b>a a</b> | <b>D</b> O <b>0</b> |
| 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         | 002        | PO2                 |
|    | b) | Draw the connection diagram of a 3-phase energy meter and<br>explain its working. How do you correct it, if it is found to be<br>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<br>and explain how to overcome.                                                                                                                                                                                                                                                                | 6 Marks | L4         | CO3        | PO1                 |
|    |    | (OR)                                                                                                                                                                                                                                                                                                                                                                |         |            |            |                     |
| 6. | a) | Draw the circuit diagram of Crompton's potentiometer and<br>explain its working. Describe the steps used when measuring an<br>unknown resistance.                                                                                                                                                                                                                   | 6 Marks | L1         | CO3        | PO5                 |
|    | b) | A Potentiometer consisting of a resistance dial having 15 steps of $10\Omega$ each and a series connected slide wire of $10 \Omega$ 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 $AB=5\Omega$ ;<br>BC=500 $\Omega$ ; CD=1000 $\Omega$ ; DA=100 $\Omega$ . The galvanometer has a<br>resistance of 100 $\Omega$ , a sensitivity of 5mm/ $\mu$ A and it is connected<br>across AC. A source of 5V DC is connected across BD. Calculate<br>the current through the galvanometer and its deflection, if the<br>resistance of arm DA is changed from 100 $\Omega$ to 102 $\Omega$ .                         | 6 Marks    | L3 | CO4 | PO4 |
| 8  | a) | Show how the Wien's bridge can be used for the measurement of                                                                                                                                                                                                                                                                                                                                                                                                             | 6 Marks    | L2 | CO4 | PO1 |
| 0. | u) | frequency in audio range. Derive the equation for frequency <b>f</b> .                                                                                                                                                                                                                                                                                                                                                                                                    | 0 10101110 | 22 | 001 | 101 |
|    | b) | The four arms of an A.C. bridge network are as follows:                                                                                                                                                                                                                                                                                                                                                                                                                   | 6 Marks    | L3 | CO4 | PO4 |
|    |    | Arm AB: an unknown capacitance; Arm BC: a standard capacitor C3 of 1000pF; Arm CD: a non-inductive resistor R4 of 100 $\Omega$ in parallel with a capacitor C4 of 0.01 $\mu$ F; Arm DA: a non – inductive resistor R2 of 1000 $\Omega$ . 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. |            |    |     |     |
| 9. | a) | Explain how frequency can be measured using Lissajous patterns                                                                                                                                                                                                                                                                                                                                                                                                            | 6 Marks    | L2 | CO5 | PO5 |
|    | b) | <ul><li>Explain in detail about the following characteristics of Digital meters:</li><li>i) Resolution ii) Sensitivity iii) Accuracy, and compare with respect to analog meters.</li></ul>                                                                                                                                                                                                                                                                                | 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 |

\$\$ \$\$ \$\$

Time: 3 hours

### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

Roll No.

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

#### TRANSMISSION AND DISTRIBUTION

[Electrical and Electronics Engineering]

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 |
| 2. | a) | Derive the expression for capacitance of single core cable with                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 6 Marks  | L2  | CO1   | PO1 |
|    | )  | conductor diameter d and inner sheath diameter D.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |          |     |       |     |
|    | 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 |
| 2  | 2) | UNIT-II                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ( Manlea | T A | cor   |     |
| 3. | a) | 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  | 02    | PO4 |
|    | b) | An overhead 3-phase transmission line delivers 5000 kW at 22kV<br>at 0.8 p.f lagging, the resistance and reactance of each conductor<br>is $4\Omega$ and $6\Omega$ respectively. Determine i) sending end voltage,<br>ii) percentage regulation, iii) Transmission efficiency.                                                                                                                                                                                                                                    | 6 Marks  | L3  | CO2   | PO2 |
| 4. | a) | Derive the expressions for reflected voltage and current waves,<br>when the transmission line is terminated by the conscitive load                                                                                                                                                                                                                                                                                                                                                                                | 6 Marks  | L2  | CO2   | PO1 |
|    | b) | A cable with surge impedance of $100\Omega$ is terminated by the capacitive load.<br>A cable with surge impedance of $100\Omega$ is terminated in two parallel connected open wires having surge impedances of $600\Omega$ , and $1000\Omega$ 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 |
| 5. | a) | Derive the expressions for sag and tension when the supports are                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 6 Marks  | L2  | CO3   | PO1 |
|    |    | at unequal heights. Comment how it is useful in power system.                                                                                                                                                                                                                                                                                                                                                                                                                                                     |          |     | ~ ~ • |     |
|    | b) | A transmission line has a span of 150m between level supports. The line conductor has a cross-sectional area of $1.25$ cm <sup>2</sup> and it weighs 120kg per 100m. If the breaking stress of copper conductor is 4220 kg per cm <sup>2</sup> . Calculate the maximum sag for a safety factor of 4. Assume maximum wind pressure of 90 kg per m <sup>2</sup> .                                                                                                                                                   | 6 Marks  | L3  | CO3   | PO7 |

|    | (OR)                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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| a) | Define string efficiency. Why is it necessary to have high string efficiency? How can it be achieved?                                                                                                                                                                                                                                                                                                                         | 6 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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| b) | The three bus-bar conductors in an outdoor sub-station are<br>supplied by units of post insulators. Each unit consists of a stack<br>of 3-pin insulators fixed one on the top of the other. The voltage<br>across the lowest insulator is 8.45 kV and that across the next is<br>7.25 kV. Find the bus-bar voltage of the station.                                                                                            | 6 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            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| a) | Explain the different types of loads and it's characteristics with realistic examples.                                                                                                                                                                                                                                                                                                                                        | 6 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           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| b) | A two conductor main AB, 500m in length is fed from both ends<br>at 250 volts. Loads of 50A, 60A, 40A and 30A are tapped at<br>distance of 100m, 250m, 350m and 400m from end A<br>respectively. If the X-section of conductor be $1 \text{cm}^2$ and specific<br>resistance of the material of the conductor is $1.7\mu\Omega\text{cm}$ , determine<br>the minimum consumer voltage.                                         | 6 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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| a) | Discuss for solving AC distribution problems when power factors referred to receiving end voltage                                                                                                                                                                                                                                                                                                                             | 6 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           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| b) | A single phase distributor AB has a total impedance of $(0.1 + j \ 0.2)\Omega$ . 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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| a) | Explain the various factors to be considered to decide the ideal location of substation                                                                                                                                                                                                                                                                                                                                       | 6 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           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| 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           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| a) | Explain different bus bar arrangements with a neat sketch.                                                                                                                                                                                                                                                                                                                                                                    | 6 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           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|    | <ul> <li>a)</li> <li>b)</li> <li>a)</li> <li>b)</li> <li>a)</li> <li>b)</li> <li>a)</li> <li>b)</li> </ul>                                                                                                                                                                                                                                                                                                                    | <ul> <li>(OR)</li> <li>a) Define string efficiency. Why is it necessary to have high string efficiency? How can it be achieved?</li> <li>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.</li> <li>UNIT-IV</li> <li>a) Explain the different types of loads and it's characteristics with realistic examples.</li> <li>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 is 1-7µΩcm, determine the minimum consumer voltage.</li> <li>a) Discuss for solving AC distribution problems when power factors referred to receiving end voltage.</li> <li>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<sub>A</sub>; ii) Phase angle between V<sub>A</sub> and V<sub>B</sub>. The load power factors are with respect to the voltage at the far end.</li> <li>UNIT-V</li> <li>a) Explain the various factors to be considered to decide the ideal location of substation.</li> <li>b) Show that if the voltage drops are limited, six feeders can carry only 1.25 times as much load as the four feeders.</li> <li>(OR)</li> <li>a) Explain different bus bar arrangements with a neat sketch.</li> </ul> | (OR)a)Define string efficiency. Why is it necessary to have high string<br>efficiency? How can it be achieved?6 Marksb)The three bus-bar conductors in an outdoor sub-station are<br>supplied by units of post insulators. Each unit consists of a stack<br>of 3-pin insulators fixed one on the top of the other. The voltage<br>across the lowest insulator is 8.45 kV and that across the next is<br>7.25 kV. Find the bus-bar voltage of the station.6 Marksa)Explain the different types of loads and it's characteristics with<br>realistic examples.6 Marksb)A two conductor main AB, 500m in length is fed from both ends<br>at 250 volts. Loads of 50A, 60A, 40A and 30A are tapped at<br>distance of 100m, 250m, 350m and 400m from end A<br>respectively. If the X-section of conductor is 1.7μΩcm, determine<br>the minimum consumer voltage.6 Marksa)Discuss for solving AC distribution problems when power factors<br>referred to receiving end voltage.6 Marksb)A single phase distributor AB has a total impedance of<br>(0·1 + j 0·2)Ω. At the far end B, a current of 80A at 0.8 p.f.<br>lagging and at mid-point C a current of 100A at 0.6 p.f. lagging<br>are tapped. If the voltage of the far end is maintained at 200V,<br>determine: i) Supply end voltage $V_A$ , ii) Phase angle between $V_A$<br>and $V_B$ . The load power factors are with respect to the voltage at<br>the far end.6 Marksb)Show that if the voltage drops are limited, six feeders can carry<br>only 1.25 times as much load as the four feeders.6 Marksc)Marks6 Marks | (OR)6 MarksI.4a)Define string efficiency. Why is it necessary to have high string<br>efficiency? How can it be achieved?6 MarksI.4b)The three bus-bar conductors in an outdoor sub-station are<br>supplied by units of post insulators. Each unit consists of a stack<br>of 3-pin insulators fixed one on the top of the other. The voltage<br>across the lowest insulator is 8+45 kV and that across the next is<br>7-25 kV. Find the bus-bar voltage of the station.6 MarksL3a)Explain the different types of loads and it's characteristics with<br>realistic examples.6 MarksL1b)A two conductor main AB, 500m in length is fed from both ends<br>at 250 volts. Loads of 50A, 60A, 40A and 30A are tapped at<br>distance of 100m, 250m, 350m and 400m from end A<br>respectively. If the X-section of conductor is 1·7μΩcm, determine<br>the minimum consumer voltage.6 MarksL2a)Discuss for solving AC distribution problems when power factors<br>referred to receiving end voltage.6 MarksL2b)A single phase distributor AB has a total impedance of<br>(0·1 + j 0·2)Ω. At the far end B, a current of 100A at 0·6 p.f. lagging<br>are tapped. If the voltage of the far end is maintained at 200V,<br>determine: i) Supply end voltage V <sub>A</sub> , ii) Phase angle between V <sub>A</sub><br>and V <sub>B</sub> . The load power factors are with respect to the voltage at<br>the far end.6 MarksL1a)Explain the various factors to be considered to decide the ideal<br>location of substation.6 MarksL1b)Show that if the voltage drops are limited, six feeders can carry<br>only 1.25 times as much load as the four feeders.<br>(OR)6 MarksL1 | (OR)6 MarksL4CO3a) Define string efficiency. Why is it necessary to have high string<br>efficiency? How can it be achieved?6 MarksL4CO3b) The three bus-bar conductors in an outdoor sub-station are<br>supplied by units of post insulators. Each unit consists of a stack<br>of 3-pin insulators fixed one on the top of the other. The voltage<br>across the lowest insulator is 8·45 kV and that across the next is<br>7·25 kV. Find the bus-bar voltage of the station.6 MarksL3CO3UNIT-IVa) Explain the different types of loads and it's characteristics with<br>realistic examples.6 MarksL1CO4CO4condition of 100m, 250m, 350m and 400m from end A<br>respectively. If the X-section of conductor is $1.7\mu\Omega$ cm, determine<br>the minimum consumer voltage.6 MarksL2CO4Of 0:<br>(0:1 + j 0·2)Ω. At the far end B, a current of 80A at 0·8 p.f.<br>lagging and at mid-point C a current of 100A at 0·6 p.f. lagging<br>are tapped. If the voltage of the far end is maintained at 200V,<br>determine:<br>i) Supply end voltage VA, ii) Phase angle between VA<br>and VB. The load power factors to be considered to decide the ideal<br>location of substation.6 MarksL1CO5a) Explain the various factors to be considered to decide the ideal<br>location of substation.6 MarksL1CO5ONON<br>ONON<br>ON<br>ONON<br>ON<br>ONON<br>ONON<br>ON<br>ONON<br>ON<br>ON<br>ON<br>ON<br>ONCO4ON<br>ON<br>ON<br>ON<br>ON |

b) Discuss in detail the present design practice of secondary 6 Marks L6 CO5 PO3 distribution system.

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### **DYNAMICS OF MACHINERY**

Time: 3 hours

| [ Mechanical Engineering ]         |                |
|------------------------------------|----------------|
|                                    | Max. Marks: 60 |
| Answer One Question from each Unit |                |
| All questions carry equal marks    |                |
|                                    |                |

A centrifugal clutch is to transmit 15 kW at 900 r.p.m. The shoes 1. 12 Marks L5 CO1 **PO2** are four in number. The speed at which the engagement begins is PO<sub>3</sub> 3/4th of the running speed. The inside radius of the pulley rim is PO4 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° and the pressure exerted on the shoes is  $0.1 \text{ N/mm}^2$ .

#### (**OR**)

- Define brake and classify them according to the means used for 2. 4 Marks L1 CO1 PO1 a) transforming the energy and according to the direction of acting force. L5 CO1 PO<sub>2</sub>
  - A single block brake is shown in figure below. The diameter of 8 Marks b) 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.



## 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                                                                   | 8 Marks | L4 | CO2 | PO2 |
|    |    | ship steers towards left/right and rotor rotates in counter                                                                    |         |    |     | PO3 |
|    |    | clockwise /clockwise direction and direction of viewing is from<br>rear end or stern                                           |         |    |     | PO4 |
|    |    | (OR)                                                                                                                           |         |    |     |     |
| 4. | a) | Differentiate coefficient of fluctuation of speed and coefficient fluctuation of energy. Explain why fluctuations of speed and | 4 Marks | L2 | CO3 | PO1 |
|    |    | energy occurs in a engine.                                                                                                     |         |    |     |     |
|    | b) | A punching press is driven by a constant torque electric motor.                                                                | 8 Marks | L5 | CO3 | PO2 |
|    |    | The press is provided with a flywheel that rotates at maximum                                                                  |         |    |     | PO3 |
|    |    | speed of 225 r.p.m. The radius of gyration of the flywheel is                                                                  |         |    |     | PO4 |
|    |    | 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.                                                                            |         |    |     |     |

PO<sub>3</sub>

PO4

## UNIT-III

| 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                                                                                                                                | L1<br>L5                                                                                                                                                                                                                             | CO4<br>CO4    | PO1<br>PO2<br>PO3<br>PO4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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| (UR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 12 Marka                                                                                                                               | 12                                                                                                                                                                                                                                   | CO4           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <ul> <li>i) Sensitiveness of a Governor.</li> <li>ii) Stability of a Governor.</li> <li>iii) Isochronous of a Governor.</li> <li>iv) Hunting.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 12 Iviaiks                                                                                                                             | LZ                                                                                                                                                                                                                                   | 04            | PO2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| (UNIT-IV)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                        |                                                                                                                                                                                                                                      |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| A shaft carries four masses in parallel planes A, B, C and D in<br>this order along its length. The masses at B and C are 18 kg and<br>12.5 kg respectively, and each has an eccentricity of 60 mm. The<br>masses at A and D have an eccentricity of 80 mm. The angle<br>between the masses at B and C is 100° and that between the<br>masses at B and A is 190°, both being measured in the same<br>direction. The axial distance between the planes A and B is<br>100 mm and that between B and C is 200 mm. If the shaft is in<br>complete dynamic balance, determine : i) the magnitude of the<br>masses at A and D ; ii) the distance between planes A and D ;<br>and iii) the angular position of the mass at D. | 12 Marks                                                                                                                               | L5                                                                                                                                                                                                                                   | CO5           | PO2<br>PO3<br>PO4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Obtain expressions for primary and secondary unbalanced forces<br>in V- engines and explain how to balance them in detail.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 12 Marks                                                                                                                               | L4                                                                                                                                                                                                                                   | CO5           | PO2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Define Longitudinal, Transverse and Torsinal vibrations.<br>A shaft 1.5 m long supported in flexible bearings at the ends<br>carries two wheels each of 50 kg mass. One wheel is situated at<br>the centre of the shaft and the other at a distance of 375 mm from<br>the centre towards left. The shaft is hollow of external diameter<br>75 mm and internal diameter 40 mm. The density of the shaft<br>material is 7700 kg/m <sup>3</sup> and its modulus of elasticity is<br>200 GN/m <sup>2</sup> . Find the lowest whirling speed of the shaft, taking<br>into account the mass of the shaft.                                                                                                                    | 3 Marks<br>9 Marks                                                                                                                     | L1<br>L5                                                                                                                                                                                                                             | CO6<br>CO6    | PO1<br>PO2<br>PO3<br>PO4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <ul> <li>(OR)</li> <li>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 : <ul> <li>i) Stiffness of each spring.</li> <li>ii) Dynamic force transmitted to the base at the operating speed.</li> <li>iii) Natural frequency of the system.</li> </ul> </li> </ul>                                                                                                                          | 12 Marks                                                                                                                               | L5                                                                                                                                                                                                                                   | CO6           | PO2<br>PO3<br>PO4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <text><text><text><list-item><list-item><list-item><text><text></text></text></list-item></list-item></list-item></text></text></text> | <text><text><text><text><list-item><list-item><text><text><text><text><text><text><text><text><text><text></text></text></text></text></text></text></text></text></text></text></list-item></list-item></text></text></text></text> | <text></text> | <ul> <li>A make a function of the Porter type, the upper and lower arises of rotation. The mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the central load is 15 kg, the mass of the load is 15 kg, the mass of the load kg, the l</li></ul> |

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<br>All questions carry equal marks |                                                                                                                                                                                                                    |                |    |     |     |
|               |                                                                       |                                                                                                                                                                                                                    |                |    |     |     |
| 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<br>examples:<br>Accuracy, precision, calibration, interchange ability and selective<br>assembly.                                                     | 6 Marks        | L2 | CO1 | PO2 |
| •             | 、<br>、                                                                | (OR)                                                                                                                                                                                                               |                |    | 001 |     |
| 2.            | a)                                                                    | Explain the different types of fits used in engineering practice with neat sketches.                                                                                                                               | 6 Marks        | L2 | COI | 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<br>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<br>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 |
|               |                                                                       |                                                                                                                                                                                                                    |                |    |     |     |
| 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 |

| 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 | 6 Marks | L3 | CO4 | PO1 |
|    |    | and external screw threads using a pitch measuring machine.      |         |    |     |     |
|    |    | 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:                                                 | 6 Marks | L2 | CO5 | PO1 |
|    |    | i) Thermocouple material.                                        |         |    |     |     |
|    |    | ii) Advantages and disadvantages of Thermocouples.               |         |    |     |     |
|    | b) | Explain the working principle of an electrical resistance        | 6 Marks | L2 | CO5 | PO1 |
|    |    | thermometer.                                                     |         |    |     |     |

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(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 |                                    | hours                                                                                                                                                                                                                                                                                                           |          |            |          | Max. Marks: 60    |  |  |
|---------------|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|----------|-------------------|--|--|
|               | Answer One Question from each Unit |                                                                                                                                                                                                                                                                                                                 |          |            |          |                   |  |  |
|               |                                    | An 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<br>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<br>PO2<br>PO3 |  |  |
| •             | ``                                 | (OR)                                                                                                                                                                                                                                                                                                            |          | <b>T</b> 0 | 001      | DO 1              |  |  |
| 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 $1.53 \times 10^3 \text{ kg/m}^3$ , if the atmospheric pressure is equivalent to 750mm of mercury? The specific gravity of mercury is 13.6 and density of water = $1000 \text{ kg/m}^3$ . | 6 Marks  | L3         | COI      | PO1<br>PO2<br>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 linesii) Streak lines.iii) Path lines.                                                                                                                                                                                                                        | 6 Marks  | L2         | CO2      | PO1               |  |  |
|               | b)                                 | A 30cm diameter pipe, conveying water, branches into two pipes<br>of diameters 20cm and 15cm respectively. If the average velocity<br>in the 30cm diameter pipe is 2.5 m/s, find the discharge in this<br>pipe. Also determine the velocity in 15cm pipe, if the average<br>velocity in 20cm pipe is 2 m/s.     | 6 Marks  | L3         | CO2      | PO1<br>PO2<br>PO3 |  |  |
| Δ             | a)                                 | Name the different forces present in a fluid flow. For the Fuler's                                                                                                                                                                                                                                              | 6 Marks  | 12         | $CO^2$   | PO1               |  |  |
|               | u)                                 | equation of motion, which forces are considered and also derive<br>the equation.                                                                                                                                                                                                                                | 0 Iviumb | 12         | 002      | 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<br>PO2<br>PO3 |  |  |
| 5             |                                    | Define the dignle company thickness of a hour damy lawar or d device                                                                                                                                                                                                                                            | 6 Martra | тэ         | $CO^{2}$ |                   |  |  |
| 5.            | a)                                 | an expression for it.                                                                                                                                                                                                                                                                                           | o Marks  | L2         | 003      | PO1<br>PO2        |  |  |
|               | b)                                 | what do you mean by boundary layer separation? List the methods of preventing this separation.                                                                                                                                                                                                                  | 6 Marks  | L2         | 03       | POI               |  |  |

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| 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: | 6 Marks  | L3  | CO3      | PO1<br>PO2<br>PO3 |
|----|-----|-----------------------------------------------------------------------------------------------------------------------------------------|----------|-----|----------|-------------------|
|    |     | i) Darcy formula.                                                                                                                       |          |     |          |                   |
|    |     | ii) Chezy's formula, where $C = 60$ .                                                                                                   |          |     |          |                   |
|    | b)  | Define and explain the terms:                                                                                                           | 6 Marks  | L2  | CO3      | PO1               |
|    |     | i) Hydraulic gradient line.                                                                                                             |          |     |          |                   |
|    |     | ii) Total energy line.                                                                                                                  |          |     |          |                   |
|    |     | (UNIT-IV)                                                                                                                               |          |     |          |                   |
| 7. | a)  | Obtain an expression for the force exerted by a jet of water on a                                                                       | 6 Marks  | L2  | CO4      | PO1               |
|    |     | moving vertical plate in the direction of the jet.                                                                                      |          |     |          | PO2               |
|    | b)  | Water is flowing through a pipe at the end of which a nozzle is                                                                         | 6 Marks  | L3  | CO4      | PO1               |
|    |     | fitted. The diameter of the nozzle is 100mm and the head of                                                                             |          |     |          | PO2               |
|    |     | water at the center nozzle is 100m. Find the force exerted by the                                                                       |          |     |          | PO3               |
|    |     | jet of water on a fixed vertical plate. The coefficient of velocity is                                                                  |          |     |          |                   |
|    |     | given as 0.95.                                                                                                                          |          |     |          |                   |
|    |     | (OR)                                                                                                                                    |          |     |          |                   |
| 8. |     | Obtain an expression for the work done per second by water on                                                                           | 12 Marks | L3  | CO4      | PO1               |
|    |     | the runner of a Pelton wheel. Hence derive an expression for                                                                            |          |     |          | PO2               |
|    |     | maximum efficiency of the Pelton wheel giving the relationship                                                                          |          |     |          | PO3               |
|    |     | between the jet speed and bucket speed.                                                                                                 |          |     |          |                   |
|    |     | UNIT-V                                                                                                                                  |          |     |          |                   |
| 9. | a)  | Obtain an expression for the work done by impeller of a                                                                                 | 6 Marks  | L2  | CO5      | PO1               |
|    |     | centrifugal pump on water per second per unit weight of water.                                                                          |          |     |          |                   |
|    | b)  | Find the number of pumps required to take water from a deep                                                                             | 6 Marks  | L3  | CO5      | PO1               |
|    |     | well under a total head of 89m. All the pumps are identical and                                                                         |          |     |          | PO2               |
|    |     | are running at 800 rpm. The specific speed of each pump is given                                                                        |          |     |          | PO3               |
|    |     | as 25 while the rated capacity of each pump is 0.16 m <sup>3</sup> /s.                                                                  |          |     |          |                   |
|    |     | (OR)                                                                                                                                    |          |     |          |                   |
| 10 | a)  | Obtain expressions for discharge and work done to drive a                                                                               | 6 Marks  | L2  | CO5      | PO1               |
| •  | 1 \ | double acting reciprocating pump.                                                                                                       |          | т о | <u> </u> | DO 1              |
|    | b)  | A single acting reciprocating pump running at 30 r.p.m delivers                                                                         | 6 Marks  | L3  | CO5      | POI               |
|    |     | 0.012 m/s of water. The diameter of the piston is 25cm and the                                                                          |          |     |          | PO2               |
|    |     | stroke length is 50cm. Determine:                                                                                                       |          |     |          | PO3               |
|    |     | 1) theoretical discharge.                                                                                                               |          |     |          |                   |
|    |     | 11) coefficient of discharge.                                                                                                           |          |     |          |                   |
|    |     | 111) slip and % of slip.                                                                                                                |          |     |          |                   |

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**CODE No.: 19BT40304** SVEC-19 Roll No. SREE VIDYANIKETHAN ENGINEERING COLLEGE (An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu) II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021 **METAL CUTTING AND MACHINE TOOLS** [Mechanical Engineering] **Time: 3 hours** Max. Marks: 60 **Answer One Ouestion from each Unit** All questions carry equal marks UNIT-I Explain the purpose and basic elements of machining. 6 Marks L2 CO1 PO1 1. a) b) Draw the neat sketch of single point cutting tool and show the 6 Marks L1 CO1 PO1 different parts and angles on it. (**OR**) 2. Describe the conversion of tool angles using graphical method. 6 Marks L2 CO1 PO1 a) b) Explain the concept of rake and clearance angles with neat 6 Marks L2 CO1 PO1 sketch. UNIT-II 3. Explain briefly about ductile and brittle materials. 6 Marks L2 CO<sub>2</sub> **PO1** a) PO7 What are the different types of chip breakers and explain it? 6 Marks CO2 PO1 b) L2 **PO7** (**OR**) Derive the expression for the various cutting forces using CO<sub>2</sub> PO1 4. 12 Marks L3 Merchant's circle diagram. **PO2** PO<sub>3</sub> PO7 UNIT-III What is the principle of operation and specifications of lathe? 5. a) 6 Marks L2 CO<sub>3</sub> PO1 PO<sub>2</sub> PO3 Write different operations performed on lathe machine. 6 Marks L1 CO3 PO1 b) PO<sub>2</sub> (**OR**) 6. Write the classification of Automatic lathes with neat sketch. 12 Marks L1 CO3 PO1 PO2 PO7 UNIT-IV 7. List the specifications and different operations in slotting 6 Marks L1 CO<sub>4</sub> PO1 a) machine. PO<sub>2</sub> PO3 PO7 Write the principle of operation of planning machine. 6 Marks CO4 b) L1 PO1 **PO2** (**OR**) 8. Explain the differences between drilling and boring machines. 12 Marks L2 CO<sub>4</sub> 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     | 12 Marks | L2 | CO6 | PO1 |
|    |    | machines with neat sketch.                                    |          |    |     | PO7 |

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Time: 3 hours

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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]

Max. Marks: 60

Answer One Question from each Unit All questions carry equal marks

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| 1. | a)<br>b) | Give the differences between four stroke and two stroke engines.<br>Draw and explain VTD for four stroke petrol engine and PTD for                                                                                                                                          | 6 Marks<br>6 Marks | L2<br>L2 | CO1<br>CO1 | PO1<br>PO1        |
|----|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------|------------|-------------------|
|    |          | two stroke Diesel engines.                                                                                                                                                                                                                                                  |                    |          |            | PO2               |
| 2. | a)       | Briefly explain the stages of combustion in S.I Engine and<br>explain the various factors that Influence the flame speed.                                                                                                                                                   | 6 Marks            | L2       | CO1        | PO1<br>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,<br>two stroke cycle engines.<br>Indicated mean effective pressure = 50 KPa, Cylinder diameter = $21 \text{ cm}$ . Piston Stroke = $28 \text{ cm}$ . Engine speed = $360 \text{ r.p.m}$ . Brake         | 6 Marks            | L3       | CO1        | PO1<br>PO2<br>PO3 |
|    |          | Torque = 628 Nm, Fuel Consumption = 8.16 Kg/h, Calorific value of fuel = 42700 kJ/kg. calculate:                                                                                                                                                                            |                    |          |            |                   |
|    |          | <ul> <li>i) Mechanical Efficiency.</li> <li>ii) The indicated thermal efficiency.</li> <li>iii) Brake thermal efficiency</li> </ul>                                                                                                                                         |                    |          |            |                   |
|    |          | iv) Brake specific fuel consumption.                                                                                                                                                                                                                                        |                    |          |            |                   |
|    |          | (OR)                                                                                                                                                                                                                                                                        |                    |          |            |                   |
| 4. | a)       | List out the methods of obtaining Friction Power and explain any one of them in detail.                                                                                                                                                                                     | 4 Marks            | L3       | CO1        | PO1<br>PO2        |
|    | b)       | A single cylinder, four stroke diesel engine works on the following data.                                                                                                                                                                                                   | 8 Marks            | L2       | CO1        | PO3<br>PO1        |
|    |          | Cylinder bore = 15cm, Stroke = 25cm, Speed = 250 r.p.m,<br>Area of Indicator diagram = $6cm^2$ , Length of the indicator<br>diagram = 9cm, Spring Constant = 7.5 bar/cm, Brake Specific<br>Fuel Consumption = $0.24 \text{ kg/KWh}$ , C.V of fuel = $42000 \text{ kJ/kg}$ , |                    |          |            |                   |
|    |          | Diameter of brake wheel = $70$ cm, Rope diameter = $3.5$ cm, Brake load = $40$ Kg.                                                                                                                                                                                          |                    |          |            |                   |
|    |          | Calculate:                                                                                                                                                                                                                                                                  |                    |          |            |                   |
|    |          | i) Brake power.                                                                                                                                                                                                                                                             |                    |          |            |                   |
|    |          | ii) Indicated mean.<br>iii) Effective pressure                                                                                                                                                                                                                              |                    |          |            |                   |
|    |          | iv) Mechanical efficiency.                                                                                                                                                                                                                                                  |                    |          |            |                   |
|    |          | v) Indicated thermal efficiency                                                                                                                                                                                                                                             |                    |          |            |                   |
|    |          |                                                                                                                                                                                                                                                                             |                    |          |            |                   |

|    |          | (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<br>PO2<br>PO3 |
|    | b)       | In a gas turbine power plant, operating on Joule cycle, air is<br>compressed from 1 bar and 15 <sup>o</sup> C through a pressure ratio of 6. It<br>is then heated to 727 <sup>o</sup> C in the combustion chamber and expanded<br>back to a pressure of 1 bar. Calculate the net work done, cycle<br>efficiency and work ratio. Assume isentropic efficiencies of<br>turbine and compressor are 90 and 85% respectively.                             | 6 Marks            | L3       | CO2        | PO1<br>PO2<br>PO3 |
| 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               |
| 7. | a)       | Explain the effects of clearance volume in reciprocating air<br>compressor and derive an expression for volumetric efficiency in<br>terms of clearance ratio and pressure ratio.                                                                                                                                                                                                                                                                     | 6 Marks            | L3       | CO3        | PO1<br>PO2        |
|    | b)       | 2 kg/s of air enter the L.P cylinder of a two stage, reciprocating<br>air compressor. The overall pressure ratio is 9. The air at inlet to<br>compressor is at 100 kPa and 35°C. The index of compression in<br>each cylinder is 1.3. Find the Inter Cooler pressure for perfect<br>inter cooling. Also find the minimum power required for<br>compression and percentage saving over single stage<br>compression.                                   | 6 Marks            | L3       | CO3        | PO1<br>PO2<br>PO3 |
|    |          | (OR)                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |          |            |                   |
| 8. | a)<br>b) | Explain the working principle of roots blower with a neat sketch.<br>Describe the principle of operation, construction and working of<br>centrifugal compressor.                                                                                                                                                                                                                                                                                     | 6 Marks<br>6 Marks | L3<br>L2 | CO3<br>CO3 | PO1<br>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<br>PO2<br>PO3 |
|    | b)       | Steam at 20 bar, 360°C 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               |
| 10 | a)       | What are methods which can lead to increase in thermal efficiency of Rankine cycle?                                                                                                                                                                                                                                                                                                                                                                  | 6 Marks            | L4       | CO4        | PO1<br>PO2        |
|    | b)       | The steam is the working fluid in an ideal Rankine cycle with<br>superheat and reheat. The steam enters the first stage turbine at<br>8 MPa, 480°C and expands to 0.7 MPa. It is then reheated to<br>440°C before entering the second stage turbine. Where it expands<br>to the condenser pressure of 0.008 MPa. The net output of the<br>cycle is 100 MW. Determine:<br>i) thermal efficiency of the cycle.<br>ii) mass flow rate of steam in kg/h. | 6 Marks            | L3       | CO4        | PO1<br>PO2<br>PO3 |

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|      | E NU.: 19D14    | 0307                           |                                       |                     |                                |                          |                          |                  | SV       | E <b>C-19</b> |
|------|-----------------|--------------------------------|---------------------------------------|---------------------|--------------------------------|--------------------------|--------------------------|------------------|----------|---------------|
|      |                 |                                |                                       |                     |                                | Roll No                  | ).                       |                  |          |               |
|      |                 | SR                             | <b>EE VIDYANI</b><br>(An Autonomous I | KETHA<br>nstitution | Affiliated to JN               | EERING CO                | LLEGE<br>ramu)           |                  |          |               |
|      | II E            | B.Tech II                      | Semester (SV                          | EC-19               | 9) Regular                     | Examination              | ns August                | - 2021           |          |               |
|      |                 |                                | ŇA                                    | NAGE                | EMENT SCI                      | IENCE                    | U                        |                  |          |               |
|      | [ Civil<br>]    | Engineeri<br>Informatio        | ng, Mechanica<br>on Technology        | al Engi<br>, Comp   | neering, Co<br>outer Science   | e and System             | ce and Eng<br>s Engineer | jineerii<br>ing] | ng,      |               |
| Time | 3 hours         |                                |                                       |                     |                                |                          |                          | Max              | . Marks: | 60            |
|      | • 10010         |                                | Answer<br>All qu                      | One Q<br>uestion    | uestion from<br>s carry equ    | m each Unit<br>al marks  |                          |                  |          |               |
|      |                 |                                |                                       | $\Box$              |                                |                          |                          |                  |          |               |
|      | Give de example | etails abou<br>e.              | it functions of                       | f mana              | igement wit                    | h a suitable             | 12 Marks                 | L2               | CO1      | PO1           |
|      | -               |                                |                                       |                     | (OR)                           |                          |                          |                  |          |               |
| •    | Write sand role | hort notes<br>of a mana        | on conceptual ger.                    | , techn             | ical skills o                  | of a manager             | 12 Marks                 | L2               | CO1      | PO1<br>PO2    |
|      | <u> </u>        |                                |                                       | Q                   | <u>INIT-II</u>                 |                          | 10.14                    | <b>T A</b>       |          | DO 1          |
|      | Give a develop  | ment meth                      | ods adopted in                        | on of<br>Humar      | n Resource N                   | fraining and Aanagement. | 12 Marks                 | L2               | CO2      | PO1<br>PO2    |
| -    | Compar          | e and contr                    | rast between jo                       | b analy             | vsis and job e                 | evaluation.              | 12 Marks                 | L2               | CO2      | PO1           |
|      | -               |                                | -                                     |                     |                                |                          |                          |                  |          | PO2           |
|      |                 |                                |                                       | U                   | NIT-III)                       |                          |                          |                  |          |               |
|      | Facilitie       | es location                    | and layout exp                        | lain wit            | th neat diagra<br>(OR)         | ams.                     | 12 Marks                 | L2               | CO3      | PO1           |
|      | Balance         | the line fo                    | or the following                      |                     |                                |                          | 12 Marks                 | L2               | CO3      | PO1           |
|      | Task            | Operation<br>Time<br>(in Mins) | Predecessors                          | Task                | Operation<br>Time<br>(in Mins) | Predecessors             |                          |                  |          | PO2           |
|      | 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                  |                          |                  |          |               |

- 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 12 Marks L2 CO4 PO1 strategy formulation and different components of a marketing PO2 plan.

(OR)

8. Explain channels of marketing with the help of marketing 12 Marks L2 CO4 PO1 communication. PO2

## UNIT-V

9.Draw the network for the activities whose three time estimates<br/>are given in the table. From the three time estimates obtain the<br/>expected times of all the activities and find criticalpath, project<br/>duration, slack for all events, probability of completing the<br/>projectin 20 days.12 Marks<br/>PO1<br/>PO2<br/>PO3<br/>PO4<br/>PO4<br/>PO11

| Activity | Optimistic  | Most likely | Pessimistic |
|----------|-------------|-------------|-------------|
| Activity | time (days) | time (days) | 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           |



A company is designing a new product for welding 2 different 12 Marks L4 CO5 PO1 alloys. The company has limited time and resources to complete the project. PO3

> PO4 PO11

| Activity | Immediate   | Time ( | days) | Cost (Rs) |       |  |
|----------|-------------|--------|-------|-----------|-------|--|
| retivity | predecessor | Normal | Crash | Normal    | Crash |  |
| А        | -           | 4      | 3     | 400       | 125   |  |
| В        | А           | 5      | 4     | 800       | 200   |  |
| С        | А           | 4      | 2     | 520       | 150   |  |
| D        | В           | 3      | 2     | 600       | 225   |  |
| Е        | С           | 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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II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

## ANALOG COMMUNICATIONS

#### [ Electronics and Communication Engineering ]

| Time: 3 hours |     | hours                                                                                                       |            |            |            |              |
|---------------|-----|-------------------------------------------------------------------------------------------------------------|------------|------------|------------|--------------|
|               |     | Answer One Question from each Unit<br>All questions carry equal marks                                       |            |            |            |              |
|               |     |                                                                                                             |            |            |            |              |
| 1             | a)  | Define standard form of Amplitude Modulation (AM) and                                                       | 6 Marks    | L2         | CO1        | PO2          |
|               | )   | explain the time and frequency domain expression of AM wave.                                                | 0 1110     |            | 001        | 102          |
|               | b)  | The output power of an AM Transmitter is 1KW when sinusoidal                                                | 6 Marks    | L2         | CO1        | PO2          |
|               |     | signal modulated to depth of 100%. Calculate the power in each                                              |            |            |            |              |
|               |     | (OR)                                                                                                        |            |            |            |              |
| 2.            | a)  | Discuss about frequency domain description of VSB modulation                                                | 6 Marks    | L2         | CO1        | PO1          |
|               | • ` | with neat diagram.                                                                                          |            |            | <b>G A</b> | <b>D O A</b> |
|               | b)  | Explain coherent detection of SSB waves with the help of block                                              | 6 Marks    | L3         | COI        | PO2          |
|               |     |                                                                                                             |            |            |            |              |
| 3.            | a)  | An FM radio link has a frequency deviation of 40KHz, the                                                    | 6 Marks    | L1         | CO1        | PO2          |
|               | ,   | modulating signal frequency is 4 KHz. Calculate bandwidth                                                   |            |            |            |              |
|               |     | needed for the link. What will be the bandwidth, if the frequency                                           |            |            |            |              |
|               | b)  | deviation is reduced to 20 KHz.<br>Explain the EM demodulation using first order PLI                        | 6 Marks    | 12         | CO1        | PO4          |
|               | 0)  | (OR)                                                                                                        | 0 Iviai KS |            | COI        | 104          |
| 4.            | a)  | Show that frequency modulation can be derived using phase                                                   | 6 Marks    | L4         | CO1        | PO2          |
|               | 1.) | modulation.                                                                                                 | ( Maulaa   | тa         | CO1        |              |
|               | D)  | demodulator.                                                                                                | 6 Marks    | L2         | COI        | 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) = $10 \cos (2\pi 10^8 t+6)$                                       | 6 Marks    | L4         | CO2        | PO2          |
|               |     | sin $(2\pi 10^6 t)$ . Calculate Figure of Merit of this receiver.                                           |            |            |            |              |
| (             | ``  | (OR)                                                                                                        |            | та         | 002        | DOO          |
| 6.            | a)  | Derive the expression for signal to noise ratio at the output of<br>envelope detector of a normal AM System | 6 Marks    | L4         | 002        | PO2          |
|               | b)  | A message signal band limited to 10 KHz is transmitted through                                              | 6 Marks    | L1         | CO2        | PO1          |
|               |     | channel after modulation, power loss in the channel is 40dB and                                             |            |            |            |              |
|               |     | double sided noise power spectral density is given by 10 <sup>-10</sup>                                     |            |            |            |              |
|               |     | Watt/Hz. Find the transmitted power required to get output SNR                                              |            |            |            |              |
|               |     | i) FM with $\beta=4$ .                                                                                      |            |            |            |              |
|               |     | (UNIT-IV)                                                                                                   |            |            |            |              |
| 7.            | a)  | Draw the block diagram of low level and high level AM                                                       | 6 Marks    | L1         | CO3        | PO1          |
|               |     | transmitter and explain its working.                                                                        |            | <b>.</b> . | <b>a</b>   |              |
|               | b)  | Draw the block diagram of super heterodyne receiver and explain<br>the function of each block               | 6 Marks    | L1         | CO3        | PO3          |
|               |     | the function of each block.                                                                                 |            |            |            |              |

(OR)

| 8. | a) | Explain about simple AGC and delayed AGC.                    | 6 Marks | L4 | CO3 | PO2 |
|----|----|--------------------------------------------------------------|---------|----|-----|-----|
|    | b) | A super heterodyne receiver the intermediate frequency is    | 6 Marks | L1 | CO3 | PO1 |
|    |    | 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?          |         |    |     |     |
|    |    | UNIT-V                                                       |         |    |     |     |
| 9. | a) | Explain the Time division multiplexing.                      | 6 Marks | L1 | CO4 | PO1 |
|    | b) | Explain the PWM modulation and its generation with neat      | 6 Marks | L3 | CO4 | PO2 |
|    |    | sketches.                                                    |         |    |     |     |
|    |    | (OR)                                                         |         |    |     |     |
| 10 | a) | Explain the generation and demodulation of PPM with the help | 6 Marks | L1 | CO4 | PO1 |
| •  |    | of block diagram.                                            |         |    |     |     |
|    | b) | Compare the PAM, PWM and PPM.                                | 6 Marks | L2 | CO4 | PO1 |

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

#### **ELECTRONIC CIRCUIT ANALYSIS AND DESIGN**

#### munication Engineering Electronics and Instrumentation Engineering 1 [ Floatronics a

|    | [Electronics and Communication Engineering, Electronics and first unrentation Engineering] |                                                                                                                                                                                                                                                                                    |          |     |                |     |  |  |  |  |
|----|--------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----|----------------|-----|--|--|--|--|
| T  | ime: 3                                                                                     | hours                                                                                                                                                                                                                                                                              |          | Max | Max. Marks: 60 |     |  |  |  |  |
|    |                                                                                            | Answer One Question from each Unit<br>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".                                                                                                                                                                                     | 6 Marks  | L3  | CO1            | PO2 |  |  |  |  |
|    |                                                                                            | Discuss on the above statement by giving suitable expressions with your analytical skills on multistage amplifiers.                                                                                                                                                                |          |     |                |     |  |  |  |  |
|    |                                                                                            | (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 |  |  |  |  |
| 2  | 2)                                                                                         | The hybrid - nerometers of the transister used in the circuit                                                                                                                                                                                                                      | 6 Mortes | 12  | $CO^{2}$       | DOJ |  |  |  |  |
| 3. | a)                                                                                         | shown are given at room temperature: $\mathbf{g}_{\mathbf{m}} = 50 \text{mA/V}$ ,<br>$\mathbf{r}_{\mathbf{bb'}} = 100\Omega$ , $\mathbf{r}_{\mathbf{b'e}} = 1K\Omega$ , $\mathbf{r}_{\mathbf{b'c}} = 4M\Omega$ , $\mathbf{r}_{\mathbf{ce}} = 80K\Omega$ , $C_{\mathbf{c}} = 3pF$ , | 0 WAIKS  | L3  | 02             | PO2 |  |  |  |  |
|    |                                                                                            | $C_e = 100 pr$ . Using winner's theorem and approximate analysis,                                                                                                                                                                                                                  |          |     |                |     |  |  |  |  |

compute the upper 3-dB frequency of the current gain  $A_I = I_L/I_i$ .



| b) | Derive the expression for voltage gain of an emitter follower | 6 Marks | L4 | CO2 | PO2 |  |  |  |
|----|---------------------------------------------------------------|---------|----|-----|-----|--|--|--|
|    | circuit at high frequencies.                                  |         |    |     |     |  |  |  |
|    | (OR)                                                          |         |    |     |     |  |  |  |

4. a) Derive the expression for Hybrid- $\pi$  conductance of common 6 Marks L4 CO<sub>2</sub> PO<sub>2</sub> emitter transistor.

b) Derive the expression for CE Short Circuit Current Gain A<sub>i</sub> as a 6 Marks L4 CO<sub>2</sub> PO<sub>2</sub> function of frequency. Draw the frequency Response Curve.

## (UNIT-III)

5. Elucidate the concept of negative feedback with neat block a) 6 Marks L2 CO3 PO1 diagram and give the outlines of each block.

The open loop gain of an amplifier is  $A = 5 \times 10^4$ . If the open L3 b) 6 Marks CO3 **PO2** 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 ( $\beta$ ) and the closed loop gain (A<sub>f</sub>).

|    |          | (OR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |          |            |            |
|----|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------|------------|------------|
| 6. | a)       | Derive the expressions for input and output impedance of                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 6 Marks            | L4       | CO3        | PO2        |
|    | b)       | current-series feedback amplifier.<br>A voltage-series feedback amplifier employs a basic amplifier with input and output resistances each of $2k\Omega$ and gain $A = 1000 \text{ V/V}$ . The feedback factor $\beta = 0.1 \text{ V/V}$ . 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        |
|    |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                    |          |            |            |
| 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)<br>b) | A power transistor operating in class A transformer coupled<br>amplifier is to deliver a maximum of 5W to a $4\Omega$ load<br>(i.e. $R_L = 4\Omega$ ). The quiescent point is adjusted for symmetrical<br>clipping, and the collector supply voltage is $V_{CC} = 20V$ . Assume<br>ideal characteristics with $V_{min} = 0$ . Determine:<br>i) Transformer turns ratio.<br>ii) Peak collector current.<br>iii) Quiescent operating point.<br>iv) Collector-circuit efficiency.<br>Explain the origin of crossover distortion. Describe the method to<br>minimize this distortion. | 6 Marks<br>6 Marks | L3<br>L2 | CO4<br>CO4 | PO2<br>PO1 |
|    |          | (OR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |          |            |            |
| 10 | a)       | Derive an expression for bandwidth of a single stage tuned amplifier.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 6 Marks            | L3       | CO4        | PO2        |
|    | b)       | <ul><li>Write short notes on:</li><li>i) Class S Power amplifier.</li><li>ii) Heat sinks.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 6 Marks            | L1       | CO4        | PO1        |

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**CODE No.: 19BT40403** 

SVEC-19

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

Roll No.

### 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 |    | hours                                                                                                                    |         | Max    | . Marks: | 60  |
|---------------|----|--------------------------------------------------------------------------------------------------------------------------|---------|--------|----------|-----|
|               |    | Answer One Question from each Unit                                                                                       |         |        |          |     |
|               |    |                                                                                                                          |         |        |          |     |
|               |    | (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. (OR)                                                                       | 6 Marks | L1     | CO1      | PO2 |
| 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 |
| 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 |
| 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 |
| 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 | <br>L3 | CO3      | PO5 |
| 7.            | a) | Write a VHDL program for 4x1 Multiplexer and 1x4 Demultiplexer.                                                          | 6 Marks | L3     | CO4      | PO5 |
|               | b) | Explain about parity generator and checker.<br>(OR)                                                                      | 6 Marks | L2     | CO4      | PO5 |
| 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 |
| 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. (OR)                                                                                  | 6 Marks | L3     | CO5      | PO5 |
| 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 |

| C  | CODE N | No.: 19BT40404                                                                                                                                                                                               |                       |        | SVI      | EC-19 |
|----|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------|----------|-------|
|    |        | Roll No.                                                                                                                                                                                                     |                       |        |          |       |
|    |        | An Autonomous Institution, Affiliated to JNTUA, Ananthapur                                                                                                                                                   | <b>LLEGE</b><br>ramu) |        |          |       |
|    |        | II B.Tech II Semester (SVEC-19) Regular Examination                                                                                                                                                          | ns August -           | - 2021 |          |       |
|    |        | PROBABILITY AND STOCHASTIC PROCE                                                                                                                                                                             | SSES                  |        |          |       |
|    |        | [ Electronics and Communication Engineering                                                                                                                                                                  | ng]                   |        |          |       |
| Т  | ime: 3 | hours                                                                                                                                                                                                        |                       | Max    | . Marks: | 60    |
|    |        | Answer One Question from each Unit<br>All questions carry equal marks                                                                                                                                        |                       |        |          |       |
|    |        | UNIT-I                                                                                                                                                                                                       |                       |        |          |       |
| 1. | a)     | A pack contains 4 white and 2 green pencils, another contains<br>3 white and 5 green pencils. If one pencil is drawn from each<br>pack, find the probability that:                                           | 6 Marks               | L2     | CO1      | PO4   |
|    | b)     | Explain about joint and conditional probability.                                                                                                                                                             | 6 Marks               | L1     | CO1      | PO2   |
| 2  | a)     | (OR)                                                                                                                                                                                                         | 6 Marks               | 12     | CO1      |       |
| 2. | a)     | contains 3 white and 5 black balls. Two are drawn from the first<br>urn and put into the second urn and then a ball is drawn from<br>latter. What is the probability that it is a white ball?                | 0 Marks               | L2     | COI      | 104   |
|    | 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<br>$f(x) = (x/9) + K$ $0 \le x \le 6$<br>= 0 otherwise                                                                                           | 6 Marks               | L3     | CO2      | PO4   |
|    | b)     | Find the value of K and also find $P\{2 \le X \le 5\}$ .<br>Let X and Y be the random variables defined as X=Cos $\theta$ and Y=Sin $\theta$ , where $\theta$ is a uniform random variable over (0, $2\pi$ ) | 6 Marks               | L2     | CO2      | PO4   |
|    |        | i) Are X and Y Uncorrelated? ii) Are X and Y Independent?                                                                                                                                                    |                       |        |          |       |
| 4. | a)     | Prove that $P(x_1 < X < x_2) = F_x(x_2) - F_x(x_1)$                                                                                                                                                          | 6 Marks               | L2     | CO2      | PO1   |
|    | b)     | If X is a normal variate with mean 30 and standard deviation 5.                                                                                                                                              | 6 Marks               | L2     | CO2      | PO2   |
|    | ŕ      | Estimate the probabilities when.                                                                                                                                                                             |                       |        |          |       |
|    |        | i) $26 \le X \le 40$ . ii) $X \ge 45$ .                                                                                                                                                                      |                       |        |          |       |
| _  | ,      | (UNIT-III)                                                                                                                                                                                                   |                       |        | ~ ~ ~    |       |
| 5. | a)     | Explain the Gaussian Random Variable and Exponential Random                                                                                                                                                  | 6 Marks               | L1     | CO2      | PO2   |
|    | b)     | The ranks of 16 students in Mathematics and Statistics are as                                                                                                                                                | 6 Marks               | L3     | CO2      | PO2   |
|    | 0)     | follows.                                                                                                                                                                                                     | 0 10 10 10            | 20     | 002      | 102   |
|    |        | (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                                                                                                     |                       |        |          |       |
|    |        | group in Mathematics and Statistics.                                                                                                                                                                         |                       |        |          |       |
| 6. | a)     | If the joint PDF of two dimensional random variable (x, y) is given by:                                                                                                                                      | 6 Marks               | L2     | CO2      | PO4   |
|    |        | $F_{XY}(X,Y) = 2;$ for $0 < x < 1$ , $0 < y < x$<br>= 0: otherwise                                                                                                                                           |                       |        |          |       |
|    |        | Find the marginal density function of X and Y.                                                                                                                                                               |                       |        |          |       |

|    | 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                          | 6 Marks   | L3 | CO3 | PO4 |
|    |    | power spectrum $S_{XY}(\omega) = 6/[(9+\omega^2)(3+j\omega)]^2$ .                       |           |    |     |     |
|    | b) | Write short notes on cross power density spectrum.                                      | 6 Marks   | L3 | CO3 | PO2 |
| 0  |    | (OR)                                                                                    |           |    |     | DOA |
| 8. | a) | A random process has the power density spectrum                                         | 6 Marks   | L3 | CO3 | PO4 |
|    |    | $S_{YY}(\omega) = 6 \omega^2 / [1 + \omega^4]$ . Find the average power in the process. |           |    |     |     |
|    | b) | Find the auto correlation function of the random process whose                          | 6 Marks   | L3 | CO3 | PO4 |
|    |    | psd is $16/[\omega^2+4]$ .                                                              |           |    |     |     |
|    |    | UNIT-V                                                                                  |           |    |     |     |
| 9. | a) | An amplifier has a bandwidth of 500KHz, and an input resistance                         | 6 Marks   | L2 | CO4 | PO4 |
|    |    | of 150. When a 0.5 $\times$ 10 <sup>-6</sup> v input signal level is applied to the     |           |    |     |     |
|    |    | amplifier input under matched condition, the output SNR=0dB.                            |           |    |     |     |
|    |    | Determine the noise figure of the amplifier.                                            |           |    |     |     |
|    | b) | Discuss the following external noises with examples.                                    | 6 Marks   | L1 | CO4 | PO2 |
|    |    | i) Atmospheric noise.                                                                   |           |    |     |     |
|    |    | 11) Extra-terrestrial noise.                                                            |           |    |     |     |
|    |    | 111) Manmade noise.                                                                     |           |    |     |     |
| 10 | a) | (UK)                                                                                    | 6 Mortra  | тэ | CO4 |     |
| 10 | a) | amplifier having a gain of 250dB and an equivalent poise                                | 0 IVIAIKS | LZ | C04 | rU4 |
| •  |    | handwidth of 3 5MHz. The equivalent noise temperature of the                            |           |    |     |     |
|    |    | amplifier is 270K Find the available noise power                                        |           |    |     |     |
|    | b) | Write a short note on Linear Transformations of Gaussian                                | 6 Marks   | L1 | CO4 | PO2 |
|    | -, | Random Variables.                                                                       |           | 2. | 201 |     |

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

**ANALOG ELECTRONICS** 

#### [Electrical and Electronics Engineering]

| Time: 3 hours                      |    |                                                                                                                                                                                                                   |           | Max | 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.<br>(OR)                                                                                                                                                     | 6 Marks   | L1  | CO1            | PO2 |  |
| 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-                                                                                                                                                     | 6 Marks   | L3  | CO2            | PO5 |  |
|                                    |    | series feedback amplifier having A= -300, $R_i$ = 1.5k $\Omega$ , $R_o$ = 50 k $\Omega$ and $\beta$ = -1/15.                                                                                                      |           |     |                |     |  |
|                                    |    | (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.<br>(OR)                                                                                                                                             | 6 Marks   | L4  | CO2            | PO5 |  |
| 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 $\mu$ H 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                                                                                                                                                         | 6 Marks   | L3  | CO3            | PO4 |  |
|                                    |    | resistor $R_L = 8\Omega$ , using transformer coupling, $V_m = V_{CC} = 25V$ .<br>Assume necessary data.                                                                                                           |           |     |                |     |  |
| 0                                  | a) | (UK)<br>Explain the principle of operation of class C newer amplifier                                                                                                                                             | 6 Morka   | тэ  | $CO^{2}$       | DOJ |  |
| 0.                                 | a) | with neat sketches.                                                                                                                                                                                               | U IVIAIKS | LZ  | 003            | rU2 |  |
|                                    | D) | 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  | 03             | PO4 |  |

## UNIT-V

| 9. | a) | Describe how 555 Timer IC can be used to generate a square     | 6 Marks | L2 | CO4 | PO2 |
|----|----|----------------------------------------------------------------|---------|----|-----|-----|
|    |    | wave.                                                          |         |    |     |     |
|    | b) | Design a second order low pass filter with upper frequency cut | 6 Marks | L3 | CO4 | PO3 |
|    |    | off of 12 kHz.                                                 |         |    |     |     |
|    |    | (OR)                                                           |         |    |     |     |
| 10 | a) | Explain the working of 555 Timer IC in monostable multi        | 6 Marks | L2 | CO4 | PO1 |
|    |    | vibrator mode and give its applications.                       |         |    |     |     |
|    | b) | Draw the circuit diagram and explain the operation of op-amp   | 6 Marks | L3 | CO4 | PO2 |
|    |    | based second order low-pass and high-pass filters.             |         |    |     |     |
|    |    |                                                                |         |    |     |     |

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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                                     |           |                |          |              |
|               |    |                                                                     |           |                |          |              |
| 1             | a) | Describe various types of Networks                                  | 6 Marks   | L2             | CO1      | PO1          |
| 1.            | h) | Compare OSI and TCP/IP Reference Models                             | 6 Marks   | L2<br>L4       | CO1      | PO2          |
|               | 0) | (OR)                                                                | 0 IVIUIRO | E.             | 001      | 102          |
| 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.          | 6 Marks   | L4             | CO3      | PO2          |
|               |    | 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.                            |           |                |          |              |
|               | b) | Describe Bridges, Routers and Gateways.                             | 6 Marks   | L2             | CO5      | PO1          |
|               |    | (OR)                                                                |           |                |          |              |
| 4.            | a) | Consider the delay of pure ALOHA versus slotted ALOHA at            | 6 Marks   | L2             | CO1      | PO1          |
|               |    | low load. Which one is less? Explain.                               |           |                |          |              |
|               | 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      | 6 Marks   | L2             | CO2      | PO2          |
|               |    | Count-to-Infinity Problem.                                          |           |                |          |              |
|               | 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            | 6 Marks   | L4             | CO4      | PO2          |
|               |    | top-level domains? If so, give a plausible example. If not, explain |           |                |          |              |
|               |    | why not.                                                            |           |                |          |              |
|               | b) | Describe HTTP and FTP.                                              | 6 Marks   | L2             | CO4      | PO6          |
|               |    | (OR)                                                                |           | <b>.</b> .     | <b>a</b> | <b>D</b> = 5 |
| 10            | a) | Analyze Name servers.                                               | 6 Marks   | L4             | CO4      | PO2          |
| •             | b) | Describe various Message Formats.                                   | 6 Marks   | L2             | CO4      | PO1          |

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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

#### **DATABASE MANAGEMENT SYSTEMS**

# [ Computer Science and Engineering, Information Technology,

**Computer Science and Systems Engineering**]

| Time: 3 hours |         |                                                                   |             |         | Max. Marks: 60 |     |  |
|---------------|---------|-------------------------------------------------------------------|-------------|---------|----------------|-----|--|
|               |         | All questions carry equal marks                                   |             |         |                |     |  |
|               |         |                                                                   |             |         |                |     |  |
| 1             | a)      | Define a data model. Describe various data models                 | 6 Marka     | T 1     | CO1            |     |  |
| 1.            | $a_{j}$ | Discuss about database languages with suitable example            | 6 Marks     | $1^{1}$ | C01            |     |  |
|               | 0)      | (OR)                                                              | 0 WIAIKS    | L       | COI            | 102 |  |
| 2.            | a)      | Explain the following:                                            | 6 Marks     | L3      | CO1            | PO1 |  |
|               |         | i) Entity Type. ii) Relationship Type. iii) Weak-entity set.      |             |         |                |     |  |
|               | b)      | Construct ER model for Student database of University with a      | 6 Marks     | L3      | CO1            | PO2 |  |
|               |         | neat diagram                                                      |             |         |                |     |  |
|               |         | 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     | Ll      | 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           | 6 Marks     | L1      | CO4            | PO1 |  |
|               | 1 \     | concept.                                                          | OV 1        | 1.0     | 004            | DOA |  |
|               | b)      | Describe about different normal forms used to normalize the       | 6 Marks     | L2      | CO4            | PO2 |  |
|               |         | relations.                                                        |             |         |                |     |  |
| 8             | a)      | Draw and explain Transaction state transition diagram             | 6 Marks     | 13      | CO4            | PO2 |  |
| 0.            | b)      | What is serializability? Explain its concept                      | 6 Marks     | LJ      | CO4            | PO2 |  |
|               | 0)      |                                                                   | 0 101001110 | 21      | 001            | 102 |  |
| 0             | a)      | Describe Two-Phase Locking protocol and explain about various     | 6 Marks     | 12      | COS            | PO1 |  |
| ).            | a)      | types of Two-Phase Locking                                        | 0 WILLING   |         | 005            | 101 |  |
|               | b)      | Explain about Multi-version concurrency control mechanism.        | 6 Marks     | L3      | CO5            | PO2 |  |
|               | 0)      | (OR)                                                              | 0 10100110  | 20      | 000            | 102 |  |
| 10            | a)      | State and explain various file organization methods. Give         | 6 Marks     | L2      | CO5            | PO1 |  |
|               | /       | suitable examples to each of them.                                |             |         |                |     |  |
|               | b)      | Distinguish between extendible and linear hashing.                | 6 Marks     | L1      | CO5            | PO1 |  |
|               |         |                                                                   |             |         |                |     |  |

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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

## DESIGN AND ANALYSIS OF ALGORTIHMS

[ Computer Science and Engineering, Computer Science and Systems Engineering]

| Т  | ime: 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.   | 6 Marks   | L3             | CO3        | PO3         |  |
|    |           | Show its time complexity using step count method                   |           |                |            |             |  |
| ว  | a)        | (UR)                                                               | 6 Marka   | T A            | CO1        | DOJ         |  |
| 2. | <i>a)</i> | bound on T.                                                        | 0 IVIAIKS | L4             | COI        | r02         |  |
|    |           | T(n) = 2T(n/2) + n, if $n > 1$                                     |           |                |            |             |  |
|    |           | = 1 otherwise                                                      |           |                |            |             |  |
|    | b)        | Define amortized analysis illustrate aggregate analysis with       | 6 Marks   | L3             | CO1        | PO1         |  |
|    |           | example.                                                           |           |                |            |             |  |
| 2  | `         |                                                                    |           | ти             | 002        | <b>DO</b> 2 |  |
| 3. | a)        | Sort these elements using merge sort algorithm Analyze its time    | 6 Marks   | L4             | 02         | PO2         |  |
|    |           | complexity and represent in the form of recurrence relation.       |           |                |            |             |  |
|    | b)        | Illustrate simpleFind() and collapsingFind() algorithms with       | 6 Marks   | L2             | CO2        | PO1         |  |
|    |           | suitable examples.                                                 |           |                |            |             |  |
|    | `         | (OR)                                                               |           | T 1            | <b>G Q</b> | <b>DO</b> 1 |  |
| 4. | a)<br>b)  | Describe the general method of Divide and Conquer in detail.       | 6 Marks   |                | CO2        | POI         |  |
|    | U)        |                                                                    | 0 WIAIKS  | LZ             | 002        | FUI         |  |
| 5  | a)        | Compute the length of optimal tour of traveling sales person for   | 6 Marks   | I.4            | CO3        | PO3         |  |
| 0. | u)        | the following digraph with its edge lengths.                       | 0 marks   | E.             | 005        | 105         |  |
|    |           |                                                                    |           |                |            |             |  |
|    |           |                                                                    |           |                |            |             |  |
|    |           |                                                                    |           |                |            |             |  |
|    |           |                                                                    |           |                |            |             |  |
|    |           | (a)(b)                                                             |           |                |            |             |  |
|    | b)        | Find all pairs shortest paths for the following graph using Floyd- | 6 Marks   | L4             | CO3        | PO2         |  |
|    |           | War shall algorithm.                                               |           |                |            |             |  |
|    |           |                                                                    |           |                |            |             |  |



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

# UNIT-IV

- 7. a) State Huffmann coding. Illustrate it with suitable example. 6 Marks L3 CO2 PO2
  - b) Compute all possible subsets of  $w[1:7] = \{15, 7, 20, 5, 18, 10, 6 \text{ Marks } L3 \text{ CO2 } PO2 \\ 12\}$  and m = 35 by applying sum of subsets approach.

(OR)

- 8. a) State Job sequencing with deadlines problem. Outline the steps 6 Marks L3 CO2 PO2 of algorithm to solve it.
  - b) What is Hamiltonian Cycle? Draw the portion of state space tree 6 Marks L3 CO2 PO2 for the following graph using backtracking approach?



## UNIT-V

9. Obtain the portion of the State Space tree that will be generated 12 Marks L2 CO3 PO2 by Least Cost Branch and Bound for the following cost matrix of Travelling sales person instance.

|                 |          |          |          | (OR) |  |  |  |  |
|-----------------|----------|----------|----------|------|--|--|--|--|
| 18              | 14       | 9        | 8        | 8    |  |  |  |  |
| 9               | 3        | 5        | $\infty$ | 11   |  |  |  |  |
| 5               | 8        | $\infty$ | 6        | 18   |  |  |  |  |
| 3               | $\infty$ | 6        | 14       | 9    |  |  |  |  |
| $\infty$        | 7        | 3        | 12       | 8    |  |  |  |  |
| cison instance. |          |          |          |      |  |  |  |  |

- 10 a) Compare and contrast deterministic and non-deterministic 6 Marks L3 CO4 PO2 . algorithms.
  - b) State Cook's theorem. Discuss the importance of this theorem. 6 Marks L2 CO4 PO1

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CODE No.: 19BT40504

Roll No.

SVEC-19

## **SREE VIDYANIKETHAN ENGINEERING COLLEGE**

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

## **CYBER LAWS AND SECURITY**

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

| Ti | me: 3    | hours                                                                 |           | Max       | . Marks: | 60           |
|----|----------|-----------------------------------------------------------------------|-----------|-----------|----------|--------------|
|    |          | Answer One Question from each Unit<br>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)                                                                  |           |           | 004      | <b>D</b> O 4 |
| 2. |          | Define Jurisdiction. List the three pre-requisites of Jurisdiction.   | 12 Marks  | L2        | COI      | 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        | 6 Marks   | L4        | CO2      | PO1          |
|    | ,        | Act, 2000.                                                            |           |           |          |              |
|    |          | (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:                                               | 12 Marks  | L2        | CO2      | PO1          |
|    |          | i) Cryptography. ii) UNCITRAL.                                        |           |           |          |              |
| _  |          | (OR)                                                                  |           |           |          |              |
| 6. | a)       | Briefly explain E-Money and RBI's guidelines on mobile                | 6 Marks   | L3        | CO2      | PO1          |
|    | 1)       | banking and payments                                                  |           | 1.0       | 002      | <b>DO</b>    |
|    | b)       | What is the role of certifying authority in PKI, The Indian           | 6 Marks   | L2        | CO2      | PO2          |
|    |          | Information Technology Act and Electronic signatures?                 |           |           |          |              |
| _  | ,        | UNIT-IV                                                               |           |           | ~ ~ •    |              |
| 7. | a)       | Define intellectual property rights. Explain the objectives and       | 6 Marks   | L2        | CO3      | PO1          |
|    | 1-)      | Importance of intellectual property law.                              |           | 1.2       | CON      |              |
|    | D)       | Briefly explain the copyright issues on the internet.                 | 6 Marks   | L2        | 003      | POI          |
| 8  | a)       | (UR)<br>Explain convright protection for computer software            | 6 Marka   | 12        | CO3      | DO6          |
| 0. | a)<br>b) | Discuss Digital Rights Management                                     | 6 Marks   | 12        | CO3      | PO6          |
|    | 0)       |                                                                       | 0 IviaiKS |           | 005      | 100          |
| 0  | a)       | Compare India logislations with USA in Cyber arimes                   | 6 Marka   | τ.4       | CO4      | DOO          |
| 9. | a)<br>b) | What is Cyber Stalking? How this is different with Cyber              | 6 Marks   | L4<br>I / | C04      |              |
|    | 0)       | Terrorism                                                             | 0 Iviaiks | L4        | 004      | 100          |
|    |          | (OR)                                                                  |           |           |          |              |
| 10 | a)       | What is cyber crime? Explain its categories.                          | 6 Marks   | L2        | CO4      | PO8          |
| •  | b)       | What are the challenges to right of privacy in India?                 | 6 Marks   | L2        | CO4      | PO8          |
|    | /        |                                                                       |           |           |          |              |

**CODE No.: 19BT41001** 

SVEC-19

# SREE VIDYANIKETHAN ENGINEERING COLLEGE

Roll No.

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

## INDUSTRIAL INSTRUMENTATION

[Electronics and Instrumentation Engineering]

| Ti | fime: 3 hours |                                                                                                                                   |                    | Max. Marks: 60 |            |            |  |
|----|---------------|-----------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------|------------|------------|--|
|    |               | Answer One Question from each Unit<br>All questions carry equal marks                                                             |                    |                |            |            |  |
|    |               |                                                                                                                                   |                    |                |            |            |  |
| 1. | a)<br>b)      | Discuss Hot-wire gas bridge type.<br>Compare Searle's rotating cylinder, Cone and Plate viscometer.                               | 4 Marks<br>8 Marks | L2<br>L3       | CO1<br>CO1 | PO1<br>PO1 |  |
| 2. | a)<br>b)      | Define Density, Viscosity and Humidity.<br>Write short notes on Psychrometer and hygrometer.                                      | 6 Marks<br>6 Marks | L2<br>L2       | CO1<br>CO1 | PO1<br>PO1 |  |
|    |               | UNIT-II                                                                                                                           |                    |                |            |            |  |
| 3. | a)<br>b)      | Explain Force balance and Vibrating Cylinder.<br>With necessary diagram discuss Low Pressure measurement.<br>(OR)                 | 6 Mark<br>6 Mark   | L2<br>L2       | CO2<br>CO2 | PO1<br>PO2 |  |
| 4. | a)<br>b)      | Describe McLeod and Knudsen Gage.<br>List the advantage and disadvantage of electrical types measurements.                        | 6 Marks<br>6 Marks | L2<br>L2       | CO2<br>CO2 | PO1<br>PO2 |  |
|    |               | (UNIT-III)                                                                                                                        |                    |                |            |            |  |
| 5. | a)<br>b)      | Elaborate Float–and– tape and Float–and–shaft method.<br>Distinguish Inductive and Capacitance type.                              | 7 Marks<br>5 Marks | L3<br>L2       | CO3<br>CO3 | PO1<br>PO1 |  |
| 6. | a)            | (OK)<br>Illustrate the working principle of Air-Purge type with necessary<br>diagram.                                             | 8 Marks            | L3             | CO3        | PO2        |  |
|    | b)            | Deliberate principle of the Bubbler type with advantage and disadvantage.                                                         | 4 Marks            | L1             | CO3        | PO3        |  |
|    |               |                                                                                                                                   |                    |                |            |            |  |
| 7. | a)<br>b)      | Explain the Turbo magnetic flow meter with diagram.<br>Describe with neat sketch Gyroscopic flow mete.                            | 7 Mark<br>5 Marks  | L3<br>L2       | CO4<br>CO4 | PO1<br>PO1 |  |
| 8. | a)<br>b)      | Illustrate the working of Electromagnetic flow meter.<br>Discuss the advantages and disadvantages of rotameter.                   | 8 Marks<br>4 Marks | L3<br>L1       | CO4<br>CO4 | PO2<br>PO1 |  |
|    |               | UNIT-V                                                                                                                            |                    |                |            |            |  |
| 9. | a)<br>b)      | Write short notes on Chopper and low drift amplifier.<br>Describe working principle of charge and electrometer amplifier.<br>(OR) | 4 Marks<br>8 Marks | L1<br>L3       | CO5<br>CO5 | PO1<br>PO1 |  |
| 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

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

# THEORY OF COMPUTATION

## [Computer Science and Systems Engineering]

| Т  | ime: 3 | hours                                                                         |         | Max        | . Marks: | 60           |
|----|--------|-------------------------------------------------------------------------------|---------|------------|----------|--------------|
|    |        | Answer One Question from each Unit<br>All questions carry equal marks         |         |            |          |              |
|    |        |                                                                               |         |            |          |              |
| 1. | a)     | Design a DFA for the set of all strings with exactly 3 consecutive            | 6 Marks | L4         | CO1      | PO2          |
|    | • `    | zeros. $\Sigma = \{0,1\}$ .                                                   |         |            | 004      | <b>D O A</b> |
|    | b)     | Design NFA to accept the set of all strings over {a,b} that ends              | 6 Marks | L3         | COI      | PO2          |
|    |        | (OR)                                                                          |         |            |          |              |
| 2. | a)     | Construct NFA for the following NFA with $\varepsilon$ -moves, where $q_1$ is | 6 Marks | L3         | CO1      | PO2          |
|    | ,      | an initial and the final state.                                               |         |            |          |              |
|    |        | a b e                                                                         |         |            |          |              |
|    |        | $- *q_1  \Phi  \Phi  \{q_2\}$                                                 |         |            |          |              |
|    |        | $\begin{array}{c c} q_2 & \{q_3\} & \{q_4\} & \Phi \\ \hline \end{array}$     |         |            |          |              |
|    |        | $q_3 \qquad \Phi \qquad \{q_2\} \qquad \Phi$                                  |         |            |          |              |
|    | b)     | $q_4 = \Psi = \Psi = \{q_1\}$                                                 | 6 Marks | Ι <i>Λ</i> | $CO^{2}$ | DO3          |
|    | U)     | if L is accepted by some DFA                                                  | 0 Walks | L4         | 02       | ros          |
|    |        | (UNIT-II)                                                                     |         |            |          |              |
| 3. | a)     | Write Regular-Expression for the following languages.                         | 6 Marks | L3         | CO2      | PO1          |
|    |        | 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 $\Sigma = \{0,1\}$ where the set of strings in     |         |            |          |              |
|    |        | which every 0 is immediately followed by at least two 1's.                    |         |            |          |              |
|    | 1 \    |                                                                               |         | та         | 000      | DOO          |
|    | D)     | Minimize the following DFA.                                                   | 6 Marks | L4         | 02       | PO2          |
|    |        |                                                                               |         |            |          |              |
|    |        |                                                                               |         |            |          |              |
|    |        |                                                                               |         |            |          |              |
|    |        | (q3) 0 (q4)                                                                   |         |            |          |              |
|    |        | (OR)                                                                          |         |            |          |              |
| 4. | a)     | Derive Regular-Expression for the following Finite Automaton.                 | 6 Marks | L4         | CO2      | PO3          |
|    |        | 1                                                                             |         |            |          |              |
|    |        | $\Lambda$ $\Lambda$ $\Lambda$                                                 |         |            |          |              |
|    |        |                                                                               |         |            |          |              |
|    |        |                                                                               |         |            |          |              |
|    | b)     | Write Regular-Expression for the following Languages.                         | 6 Marks | L3         | CO2      | PO1          |
|    |        | i) $L = \{\text{Set of strings of 0's and 1's ends with '01'}\}.$             |         |            |          |              |

ii)  $L = \{\text{Set of strings of a's and b's begins with 'ab' or 'ba'}\}.$ 

iii)  $L = \{$ Set of strings 0's and 1's containing substring '000' $\}$ .

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UNIT-III) Construct Parse tree and also show Left most derivation and 6 Marks L4 CO3 PO<sub>3</sub> a) Rightmost derivation for the strings 'ababbba' and 'bbbbba' from the following grammar.  $S \rightarrow aS/bS/a/b/C$ 6 Marks L4 CO<sub>4</sub> PO3 b) Generate a CFG for the language  $L=\{0^{i}1^{j}0^{k}/j > i+k\}$ . (**OR**) Convert the following CFG in Greiback Normal Form (GNF). a) 6 Marks L4 CO3 PO5  $S \rightarrow AA/a$  $A \rightarrow SS/b$ b) Find an equivalent grammar in to CNF for the following CFG. 6 Marks L4 CO3 PO5  $S \rightarrow ABCD, A \rightarrow Aa/b,$  $B \rightarrow Bb/b$ ,  $C \rightarrow Cc/c$ ,  $D \rightarrow Dd/d$ UNIT-IV a) 6 Marks L4 CO4 PO3 Consider a PDA M=( $\{s,p,q\},\{a, c\},\{a, z_0\}, \delta, s, z_0, p$ ) which accepts language  $L=\{a^ncb^n/n > = 1\}$  by final state, where  $\delta$  is defined as follows:  $\delta(s, a, z_0) = (s, az_0)$  $\delta(s, a, a) = (s, aa)$  $\delta(s, c, a) = (q, a)$  $\delta(q, a, a) = (q, \varepsilon)$  $\delta(q, \varepsilon, z_0) = (p, z_0)$ Construct an equivalent PDA M<sup>1</sup> which accepts L in empty stack Design PDA for language  $L=\{w | w \text{ contains equal number of } a's \}$ b) 6 Marks L4 CO<sub>4</sub> **PO2** and b's  $\}$ . (**OR**) a) 6 Marks L3 CO3 PO<sub>3</sub> For the PDA M =  $(\{q_0,q_1\},\{0,1\},\{0,1,z_0\},\delta,q_0,Z_0,\Phi)$  where  $\delta$  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)\},\$  $\delta(q_0,0,1) = \{(q_1,\varepsilon)\}, \ \delta(q_1,0,1) = \{(q_1,\varepsilon)\}, \ \delta(q_1,0,0) = \{(q$  $\delta(q_1,\varepsilon,Z_0) = \{(q_1,\varepsilon)\}$ Obtain the CFG generating the language accepted by M. This PDA accepts L= $\{1n0m+n/m, n \ge 0.$ Construct PDA equivalent to the following grammar. CO4 **PO2** b) 6 Marks L4  $S \rightarrow aAA$ ,  $A \rightarrow aS/bS/a$ . UNIT-V Define Turing Machine. Explain Modifications of Turing L3 a) 6 Marks CO5 PO3 Machine. Design Turing machine for language  $L = \{WW^R \mid W \text{ is in }$ L3 CO5 PO<sub>3</sub> b) 6 Marks  $(0+1)^*$ . (**OR**) a) Design a TM to perform addition of two unary numbers. 6 Marks L4 CO5 PO<sub>3</sub> Explain Language acceptability by Turing machine with an L2 CO2 PO1 b) 6 Marks example.

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is ambiguous or not?

## SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu) II B.Tech II Semester (SVEC-19) Regular Examinations August – 2021

## THEORY OF COMPUTATION

[Information Technology] Time: 3 hours Max. Marks: 60 **Answer One Ouestion from each Unit** All questions carry equal marks UNIT-I Design a DFA to accept the language where  $L = \{w | w \text{ has both }$ a) 6 Marks L3 CO<sub>2</sub> **PO2** an even number of 0's and even number of 1's}. Construct DFA for the given following NFA. b) 6 Marks L4 CO1 PO<sub>2</sub> 0, 0, 1 0 0 0, (OR)State and prove equivalence of NFA with  $\varepsilon$  – transitions and a) 6 Marks L4 CO<sub>2</sub> PO<sub>3</sub> NFA. b) Compare and contrast Moore machine and Mealy machine. 6 Marks L3 CO1 **PO2** UNIT-II) Discuss in detail the closure properties of regular sets. a) 6 Marks L4 CO<sub>2</sub> PO<sub>2</sub> Construct a finite automata equivalent to  $(0+1)^*(00+11)(0+1)^*$ . CO3 b) 6 Marks PO1 L2 (**OR**) a) Minimize the following automata. 6 Marks L4 CO<sub>2</sub> **PO2** 0. 1 0 1 а 1 Discuss in detail Applications of regular expressions. 6 Marks b) L3 CO<sub>2</sub> PO1 (UNIT-III) What is an ambiguous grammar? Check the grammar G having 12 Marks L4 CO3 PO5

(**OR**)

productions S  $\rightarrow$  aB / bA, A  $\rightarrow$  a / aS / bAA, B  $\rightarrow$  b / bS / aBB

|    |    | (01)                                                                                                 |         |    |     |     |
|----|----|------------------------------------------------------------------------------------------------------|---------|----|-----|-----|
| 6. | a) | Remove the useless symbols of the following CFG having                                               | 6 Marks | L4 | CO3 | PO3 |
|    |    | productions.                                                                                         |         |    |     |     |
|    |    | $S \rightarrow aB/aCD/aE, B \rightarrow bC, C \rightarrow aB/b, D \rightarrow aE, E \rightarrow bCD$ |         |    |     |     |
|    | b) | Convert the following grammar G having productions                                                   | 6 Marks | L4 | CO3 | PO3 |
|    |    | $E \rightarrow E + T / T, T \rightarrow T * F / F, F \rightarrow (E) / id,$                          |         |    |     |     |
|    |    | into equivalent CNF grammar.                                                                         |         |    |     |     |

1.

| a) | Design a PDA for the language $L = \{anb2n/n \ge 1\}$ .                                                    | 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)                                                                                                       |                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| a) | Convert the grammar                                                                                        | 6 Marks                                                                                                                                                             | L3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | CO4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | PO2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|    | $S \rightarrow 0AA$                                                                                        |                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|    | $A \rightarrow 0S/1S/0$                                                                                    |                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|    | to a PDA that accepts the same language by empty stack.                                                    |                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| b) | Convert the following CFG to a PDA                                                                         | 6 Marks                                                                                                                                                             | L2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | CO4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | PO1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|    | $S \rightarrow aAA, A \rightarrow aS/bS/a$                                                                 |                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|    | UNIT-V                                                                                                     |                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 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)                                                                                                       |                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|    | <ul> <li>a)</li> <li>b)</li> <li>a)</li> <li>b)</li> <li>a)</li> <li>b)</li> <li>a)</li> <li>b)</li> </ul> | <ul> <li>UNIT-IV</li> <li>a) Design a PDA for the language L= {anb2n/n≥1}.</li> <li>b) Construct PDA for the language having equal number of a's and b's.</li></ul> | UNIT-IVa)Design a PDA for the language L= $\{anb2n/n\geq 1\}$ .6 Marksb)Construct PDA for the language having equal number of a's and<br>b's.6 Marks(OR)a)Convert the grammar<br>$S \rightarrow 0AA$<br>$A \rightarrow 0S/1S/0$ 6 Marksb)Convert the grammar<br>S $\rightarrow 0AA$<br>$A \rightarrow 0S/1S/0$ 6 Marksb)Convert the following CFG to a PDA<br>S $\rightarrow aAA$ , $A \rightarrow aS/bS/a$ 6 MarksUNIT-Va)Design a Turing machine to compute factorial of a give number.<br>Briefly explain various types of Turing machine.<br>(OR)6 Marksa)Discuss in detail Techniques for Turing machine construction.<br>Explain about Universal Turing machine.6 Marks | UNIT-IVa) Design a PDA for the language L= $\{anb2n/n\geq 1\}$ .6 MarksL4b) Construct PDA for the language having equal number of a's and b's.6 MarksL4(OR)a) Convert the grammar<br>$S \rightarrow 0AA$<br>$A \rightarrow 0S/1S/0$ 6 MarksL3S $\rightarrow 0AA$<br>$A \rightarrow 0S/1S/0$ to a PDA that accepts the same language by empty stack.b) Convert the following CFG to a PDA<br>$S \rightarrow aAA$ , $A \rightarrow aS/bS/a$ 6 MarksL2UNIT-Va) Design a Turing machine to compute factorial of a give number.6 MarksL3b) Briefly explain various types of Turing machine.<br>(OR)6 MarksL2(OR)a) Discuss in detail Techniques for Turing machine construction.6 MarksL4b) Explain about Universal Turing machine.6 MarksL4 | UNIT-IVa)Design a PDA for the language $L= \{anb2n/n \ge 1\}$ .6 MarksL4CO4b)Construct PDA for the language having equal number of a's and<br>b's.6 MarksL4CO4(OR)a)Convert the grammar<br>$S \rightarrow 0AA$<br>$A \rightarrow 0S/1S/0$ 6 MarksL3CO4b)Convert the following CFG to a PDA<br>$S \rightarrow aAA$ , $A \rightarrow aS/bS/a$ 6 MarksL2CO4UNIT-Va)Design a Turing machine to compute factorial of a give number.<br>Briefly explain various types of Turing machine.<br>(OR)6 MarksL3CO5b)Discuss in detail Techniques for Turing machine construction.<br>Explain about Universal Turing machine.6 MarksL4CO5b)Explain about Universal Turing machine.6 MarksL4CO5 |

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| С  | ODE N  | No.: 19BT50107                                                                                                                                                                              |                                     |        | SV       | EC-              |
|----|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------|----------|------------------|
|    |        | Roll No                                                                                                                                                                                     | •                                   |        |          |                  |
|    |        | SREE VIDYANIKETHAN ENGINEERING COU<br>(An Autonomous Institution, Affiliated to JNTUA, Ananthapur<br>II B.Tech II Semester (SVEC-19) Regular Examination<br>ENVIRONMENTAL POLLUTION AND CON | LEGE<br>amu)<br>Is August -<br>ΓROL | - 2021 |          |                  |
|    |        | [ Electrical and Electronics Engineering, Electronics and Comm<br>Electronics and Instrumentation Engineerin                                                                                | unication E<br>g ]                  | nginee | ering,   |                  |
| Т  | ime: 3 | hours                                                                                                                                                                                       |                                     | Max    | . Marks: | : 60             |
|    |        | Answer One Question from each Unit<br>All questions carry equal marks                                                                                                                       |                                     |        |          |                  |
|    |        |                                                                                                                                                                                             |                                     |        |          |                  |
| 1. | a)     | Define air pollution. Describe classification of air pollutants with suitable examples.                                                                                                     | 6 Marks                             | L2     | CO1      | I<br>I           |
|    | b)     | What are the effects of various pollutants on human health and materials?                                                                                                                   | 6 Marks                             | L2     | CO1      | H<br>H<br>H      |
|    |        | (OR)                                                                                                                                                                                        |                                     |        |          |                  |
| 2. | a)     | Distinguish between lapse rate and inversion. Give a detailed<br>analysis on plume behavior under various atmospheric<br>conditions.                                                        | 6 Marks                             | L3     | CO1      | ł                |
|    | b)     | Define Sound pressure, Sound power and Sound intensity.<br>Explain the impacts of noise pollution.                                                                                          | 6 Marks                             | L2     | CO1      | I<br>I           |
| 3. | a)     | Draw and explain the principle and working of a bag house filter.<br>What are the applications of filters?                                                                                  | 6 Marks                             | L3     | CO2      | I<br>I           |
|    | b)     | Discuss any two methods for the control of gaseous pollutants.                                                                                                                              | 6 Marks                             | L2     | CO2      | I<br>I<br>I      |
|    |        | (OR)                                                                                                                                                                                        |                                     |        |          | -                |
| 4. | a)     | Explain working of a venturi scrubber with suitable diagram.                                                                                                                                | 6 Marks                             | L3     | CO2      | I<br>I           |
|    | b)     | Suggest various measures you adopt for the control of noise pollution.                                                                                                                      | 6 Marks                             | L4     | CO2      | H<br>H<br>H<br>T |
|    |        |                                                                                                                                                                                             |                                     |        |          | 1                |
| 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      | I                |
|    | b)     | Distinguish between surface water quality and ground water quality.                                                                                                                         | 3 Marks                             | L4     | CO3      | I                |
|    | c)     | Write the Permissible limits of the following parameters for<br>Drinking water supplies: i) Fluorides ii) Turbidity iii) Chlorides<br>iv) Hardness v) Nitrates vi) Ph.                      | 3 Marks                             | L1     | CO3      | H<br>H           |
| 6. | a)     | Examine the importance of Aeration, Softening and Disinfection processes in water treatment.                                                                                                | 6 Marks                             | L4     | CO3      | I                |

PO7 Describe primary and secondary treatment of wastewater. 6 Marks L2 CO3 PO2 b)

PO4 PO6

SVEC-19

PO1 PO2

PO1 PO4 PO7

PO1 PO2

PO1 PO6

PO1 PO2 PO5

PO2 PO7

PO1 PO5

PO1 PO2 PO3 PO7

PO2 PO3

PO1 PO4

PO7 PO8

PO2 PO4

PO6

|    |    |                                                                                                                                                 |         |            |     | PO7                              |
|----|----|-------------------------------------------------------------------------------------------------------------------------------------------------|---------|------------|-----|----------------------------------|
|    |    | UNIT-IV                                                                                                                                         |         |            |     |                                  |
| 7. | a) | Define soil pollution. Discuss the sources of soil pollution.                                                                                   | 6 Marks | L2         | CO4 | PO1<br>PO4                       |
|    | b) | <ul><li>Write short notes on the following:</li><li>i) Diseases caused by soil pollution.</li><li>ii) Minimization of soil pollution.</li></ul> | 6 Marks | L2         | CO4 | PO1<br>PO2<br>PO6<br>PO7         |
|    |    | (OR)                                                                                                                                            |         |            |     |                                  |
| 8. | a) | Explain various control measures of soil pollution.                                                                                             | 6 Marks | L4         | CO4 | PO1<br>PO2<br>PO4<br>PO7         |
|    | b) | Outline any one case study on soil pollution.                                                                                                   | 6 Marks | L4         | CO4 | PO1<br>PO2<br>PO4<br>PO6         |
|    |    | UNIT-V                                                                                                                                          |         |            |     |                                  |
| 9. | a) | Write a note on composition of municipal solid waste. What are<br>the effects of solid waste on health and environment?                         | 6 Marks | L2         | CO5 | PO1<br>PO2<br>PO6                |
|    | b) | Explain a transfer station with a neat sketch. When do you suggest transfer station?                                                            | 6 Marks | L2         | CO5 | PO1<br>PO11                      |
| 10 | ,  | (OR)                                                                                                                                            |         | <b>.</b> . | ~~~ | DOI                              |
| 10 | a) | Explain incineration, composting and open dumping methods of solid waste disposal.                                                              | 6 Marks | L4         | C05 | PO1<br>PO2<br>PO6<br>PO7<br>PO11 |
|    | b) | Write a detailed note on energy recovery from solid waste.                                                                                      | 6 Marks | L3         | CO5 | PO1<br>PO2<br>PO7<br>PO12        |

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| С  | ODE I   | No.: 19BT50109                                                                                                                                                      |                    | · · · · · ·                  |            | SVI         | EC-19                    |
|----|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------------------|------------|-------------|--------------------------|
|    |         | R                                                                                                                                                                   | oll No.            |                              |            |             |                          |
|    |         | SREE VIDYANIKETHAN ENGINEERING                                                                                                                                      | COLI               | LEGE                         |            |             |                          |
|    |         | (An Autonomous Institution, Affiliated to JN IUA, Anan<br>II B.Tech II Semester (SVEC-19) Regular Examin<br>RURAL TECHNOLOGY                                        | thapurar<br>ations | <sup>nu)</sup><br>5 August – | - 2021     |             |                          |
|    |         | [ Electrical and Electronics Engineering, Electronics and Co<br>Electronics and Instrumentation Engineering                                                         | ommu<br>eering     | nication E1                  | ıginee     | ering,      |                          |
| Т  | ime• 3  | hours                                                                                                                                                               |                    | 1                            | Max        | Marks       | 60                       |
|    | inic: 0 | Answer One Question from each U                                                                                                                                     | nit                |                              | IVIUA      | • IVIAI KS• | 00                       |
|    |         | All questions carry equal marks                                                                                                                                     |                    |                              |            |             |                          |
|    |         | UNIT-I                                                                                                                                                              |                    |                              |            |             |                          |
| 1. |         | Explain the role of rural business hubs in improving r infrastructure.                                                                                              | ural               | 12 Marks                     | L3         | CO1         | PO2<br>PO4<br>PO5        |
|    |         | (OR)                                                                                                                                                                |                    |                              |            |             |                          |
| 2. |         | Explain the role of CAPART and NIF in rural development.                                                                                                            |                    | 12 Marks                     | L4         | C01         | PO2<br>PO4<br>PO5        |
|    |         | UNIT-II                                                                                                                                                             |                    |                              |            |             |                          |
| 3. | a)      | Define Energy. Explain the structure and working of a bio<br>plant. State the uses of biogas for rural development.                                                 | ogas               | 6 Marks                      | L3         | CO2         | PO1<br>PO4<br>PO5        |
|    | b)      | State the disadvantages of incineration of biomass. Explain                                                                                                         | the                | 6 Marks                      | L2         | CO2         | PO1                      |
|    | - )     | significance of composting technology for effective utilization organic wastes.                                                                                     | n of               |                              |            |             | PO4<br>PO5               |
|    |         | (OR)                                                                                                                                                                |                    | 1036 1                       | <b>T</b> 4 |             | DO 1                     |
| 4. |         | <ul><li>Write a short note on:</li><li>i) Recycling and management.</li><li>ii) Wastes conservation.</li></ul>                                                      |                    | 12 Marks                     | L4         | CO2         | PO1<br>PO4<br>PO5<br>PO6 |
|    |         | (UNIT-III)                                                                                                                                                          |                    |                              |            |             | 100                      |
| 5. | a)      | Enlist and explain any 4 initiatives of the governments promoting cottage industries helpful in rural economic growth                                               | for                | 6 Marks                      | L2         | CO3         | PO2<br>PO5               |
|    | b)      | Write short notes on                                                                                                                                                |                    | 6 Marks                      | L3         | CO3         | PO0<br>PO2               |
|    | 0)      | i) Agro-based industries                                                                                                                                            |                    | 0 1010010                    | 20         | 000         | PO5                      |
|    |         | ii) Building and Construction technologies                                                                                                                          |                    |                              |            |             | PO6<br>PO7               |
| 6  |         | (OR)<br>Discuss foods and agra based technologies which will a                                                                                                      | ino                | 12 Mortes                    | тэ         | $CO^{2}$    |                          |
| 0. |         | employment and profits to community.                                                                                                                                | give               | 12 WAIKS                     | L2         | 005         | PO1<br>PO3<br>PO6<br>PO7 |
|    |         | UNIT-IV                                                                                                                                                             |                    |                              |            |             |                          |
| 7. | a)      | Justify fresh water and more particularly ground water a precious resource with respect to its availability for hur activities.                                     | is a<br>nan        | 6 Marks                      | L2         | CO4         | PO1<br>PO2<br>PO4        |
|    | b)      | Discuss the need for prevention of contamination of fresh w<br>resource in rural environment. Suggest measures to ensure sup<br>of safe drinking water in villages. | ater<br>oply       | 6 Marks                      | L3         | CO4         | POS<br>PO1<br>PO2<br>PO4 |
|    |         |                                                                                                                                                                     |                    |                              |            |             | PO5                      |
|    |         | (UK)                                                                                                                                                                |                    |                              |            |             |                          |

| 8. | a) | <ul><li>Write short notes on the provision of the following in rural areas.</li><li>i) Drinking water.</li><li>ii) Environment generating technologies.</li></ul> | 6 Marks  | L2 | CO4 | PO1<br>PO2<br>PO5               |
|----|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----|-----|---------------------------------|
|    | b) | Discuss any two rain water harvesting technologies employed in<br>India with suitable illustrations.                                                              | 6 Marks  | L2 | CO4 | PO6<br>PO1<br>PO2<br>PO5<br>PO7 |
|    |    |                                                                                                                                                                   |          |    |     |                                 |
| 9. |    | <ul> <li>Write a detailed note on:</li> <li>i) Saansad Adarsh Gram Yojana(SAGY).</li> <li>ii) Need and Necessity of technology in rural areas.</li> </ul>         | 12 Marks | L6 | CO5 | PO4<br>PO5<br>PO6<br>PO7        |
|    |    | (OR)                                                                                                                                                              |          |    |     |                                 |
| 10 | a) | Write a detailed note on private sector participation in development of employment in rural sector.                                                               | 6 Marks  | L2 | CO5 | PO2<br>PO5<br>PO6<br>PO7        |
|    | b) | Write a detailed note in impact of information technology in rural development.                                                                                   | 6 Marks  | L2 | CO5 | PO2<br>PO5<br>PO6<br>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 ]

Max. Marks: 60

### Time: 3 hours

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

## UNIT-I

- a) Develop and explain the Force-Voltage and Force-Current 6 Marks L1 CO1 PO1 analogy expressions.
   b) C(S) 6 Marks L2 CO1 PO2
  - b) Draw the signal flow graph and determine  $\frac{C(S)}{R(S)}$  using Mason's 6 Marks L2

gain formula for the following fig.



- 2. a) Develop the expression for transfer function of Armature 6 Marks L2 CO1 PO2 controlled DC servo motor. Draw the block diagram.
  - b) Obtain Mathematical model of the mechanical system shown in 6 Marks L2 CO1 PO2 fig.



- 3. a) Derive expressions for Rise time, Peak time, Delay time and 6 Marks L1 CO2 PO1 Maximum overshoot of second order under damped system with step input.
  - b) The open loop transfer function of a unity feed back system is 6 Marks L3 CO2 PO3 K

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%.

## (**OR**)

- 4. a) Explain briefly about the effect of adding Proportional and 6 Marks L1 CO2 PO2 Integral controllers to a control system.
  - b) For a unity feedback system the open loop transfer function is 6 Marks L3 CO2 PO3 10(s+2)

$$G(s) = \frac{10(s+2)}{s^2(s+1)}$$

i) Find the positional ,velocity and acceleration error constants .

ii) Steady state error when the input is 
$$R(s) = \frac{3}{s} - \frac{2}{s^2} + \frac{1}{s^2}$$

|    |    | UNIT-III                                                                                                                                                                       |          |    |     |     |
|----|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----|-----|-----|
| 5. |    | Draw the bode plot of $G(s)H(s) = \frac{250}{s(2.5+s)(10+s)}$ .                                                                                                                | 12 Marks | L3 | CO3 | PO4 |
|    |    | Find Gain Margin and Phase Margin.                                                                                                                                             |          |    |     |     |
| 6. |    | (OR)<br>Explain about the advantages of root locus and determine the<br>limiting value of gain 'K' for stability to the open loop transfer<br>K                                | 12 Marks | L3 | CO3 | PO4 |
|    |    | function $\frac{1}{s(1+0.1s)(1+0.2s)}$ .                                                                                                                                       |          |    |     |     |
|    |    | UNIT-IV                                                                                                                                                                        |          |    |     |     |
| 7. |    | Consider a unity feedback system with open loop transfer<br>function, $G(S) = \frac{20}{S(S+2)(S+4)}$ . Design a PD controller so                                              | 12 Marks | L4 | CO4 | PO4 |
|    |    | that the closed loop has a damping ratio of 0.8 and natural frequency of oscillation as 2 rad/sec.                                                                             |          |    |     |     |
| 8. |    | Consider a unity feedback system with open loop transfer                                                                                                                       | 12 Marks | L4 | CO4 | PO4 |
|    |    | 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%.                                                                                                                  |          |    |     |     |
|    |    | UNIT-V                                                                                                                                                                         |          |    |     |     |
| 9. | a) | Obtain the state model of the system whose transfer function is                                                                                                                | 6 Marks  | L2 | CO5 | PO5 |
|    |    | given by $\frac{y(s)}{u(s)} = \frac{10}{(s^2 + 4s^2 + 2s + 1)}$ .                                                                                                              |          |    |     |     |
|    | b) | Compute the state transition matrix of a system represented by                                                                                                                 | 6 Marks  | L3 | CO5 | PO5 |
|    |    | $\begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = \begin{bmatrix} -3 & 1 \\ -2 & 0 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u,$ |          |    |     |     |
|    |    | (OR)                                                                                                                                                                           |          |    |     |     |
| 10 |    | Define controllability and observability. Find controllability and observability of the given System                                                                           | 12 Marks | L2 | CO5 | PO5 |
| •  |    | $\begin{bmatrix} \dot{x}_1 \end{bmatrix} \begin{bmatrix} 2 & -2 & 3 \end{bmatrix} \begin{bmatrix} x_1 \end{bmatrix} \begin{bmatrix} 11 \end{bmatrix}$                          |          |    |     |     |
|    |    | $\dot{x}_{2} = 1  1  1  1   x_{2}  + 1   u ;$                                                                                                                                  |          |    |     |     |

$$\begin{bmatrix} x_1 \\ \dot{x}_2 \\ \dot{x}_3 \end{bmatrix} = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 3 & -1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} + \begin{bmatrix} 1 \\ -14 \end{bmatrix} \begin{bmatrix} u \end{bmatrix};$$
  
$$Y = \begin{bmatrix} -3 & 5 & -2 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}.$$

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SVEC-19

## **SREE VIDYANIKETHAN ENGINEERING COLLEGE**

Roll No.

(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

All questions carry equal marks

# UNIT-I

| 1. | a)<br>b)<br>c) | Define green engineering.<br>Explain the significance of green engineering practices.<br>Memorize any six principles of green engineering.         | 2 Marks<br>4 Marks<br>6 Marks | L1<br>L2<br>L1 | CO1<br>CO1<br>CO1 | PO1<br>PO1<br>PO1 |
|----|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----------------|-------------------|-------------------|
| 2. | a)<br>b)       | (OR)<br>Explain the energy saving concepts in Green Communications.<br>Discuss about extended energy model in ICT equipment.                       | 6 Marks<br>6 Marks            | L2<br>L2       | CO1<br>CO1        | PO7<br>PO6        |
| 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               |
| 4. | a)             | "Our first and foremost goal is to reduce our carbon footprint and<br>keep our planet clean." Justify suitable methods to fortify the<br>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               |
| E  | -)             |                                                                                                                                                    | ( Maulaa                      | T A            | $CO_{2}$          | DOC               |
| Э. | a)             | Analyze now a seven step approach is applicable for enterprises                                                                                    | 6 Marks                       | L4             | 003               | 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               |
| 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<br>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 |
| 10 | a) | ( <b>UK</b> )<br>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 | L2<br>L3 | CO5 | PO2 |
|    |    |                                                                                                 |         |          |     |     |

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SVEC-19

## 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 What is meant by Certified Ethical Hacker (CEH)? Discuss what 6 Marks L1 CO1 PO1 a) domains tested by CEH. Define Pen Test? different Penetration-Testing b) Explain 6 Marks L2 CO1 **PO2** methodologies. (**OR**) What is a Buffer Overflow attack? Discuss different Buffer 6 Marks L1 CO1 **PO6** a) Overflow vulnerabilities. Define worm. Explain different Common computer worms with L2 b) 6 Marks CO1 PO1 suitable examples. UNIT-II Explain any two methods social engineers use to gain access to a) 6 Marks L3 CO<sub>2</sub> **PO1** information. What is a Foot prining? How to gather information through foot b) 6 Marks L4 CO3 PO8 printing in DNS. (**OR**) Discuss in detail different Information gathering tools. 6 Marks L1 CO1 PO1 a) Define ping sweep. How to conduct ping sweep in hacking field b) 6 Marks L3 CO3 PO<sub>6</sub> explain with suitable examples. UNIT-III) What is Steganography? Discuss different Steganography 6 Marks L2 CO<sub>2</sub> PO1 a) technologies. Explain different Denial of Service (DOS) attacks. L2 b) 6 Marks CO<sub>2</sub> PO1 (**OR**) Discuss in-detail different Password cracking Techniques. PO6 a) 6 Marks L1 CO<sub>2</sub> Explain different Escalating Privileges. b) 6 Marks L2 CO1 PO<sub>2</sub> (UNIT-IV) Explain different vulnerabilities identified by the security tester a) 6 Marks L2 CO1 PO8 in the OWASP. Explain how to hack the web server using OWASP developed 6 Marks L4 CO3 b) PO<sub>6</sub> the Web Goat project to think and figure out how to launch attacks in the web applications. (OR)

### Explain the use of war driving and how it works. 6 Marks 8. L3 CO3 **PO1** a) Write short notes on wireless hackers tools : b) 6 Marks L3 CO3 **PO2** i) NetStumbler. ii) Kismet.

|    |    | UNIT-V                                                                                                                           |         |    |     |     |
|----|----|----------------------------------------------------------------------------------------------------------------------------------|---------|----|-----|-----|
| 9. | a) | What is Symmetric algorithm? Discuss different types of                                                                          | 6 Marks | L2 | CO1 | PO1 |
|    | b) | Symmetric algorithms and also specify disadvantages.<br>Distinguish between Symmetric and Asymmetric cryptography<br>algorithms. | 6 Marks | L4 | CO3 | PO8 |
|    |    | (OR)                                                                                                                             |         |    |     |     |
| 10 | a) | Explain Cisco Router Configuration access modes. What                                                                            | 6 Marks | L3 | CO3 | PO6 |
|    | b) | Commands are used to showing configuration details?<br>Describe and discuss the Cisco Router Components.                         | 6 Marks | L1 | CO2 | PO2 |

CODE No.: 19BT51207

Time: 3 hours

tests.

SVEC-19

## SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

Roll No.

## 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 ]

Max. Marks: 60

## Answer One Question from each Unit

All questions carry equal marks

# UNIT-I

| 1. | a)<br>b) | Elaborate on the usage of Artificial Intelligence in Healthcare.<br>Write different applications of Artificial Neural Networks in | 6 Marks<br>6 Marks | L1<br>L2 | CO1<br>CO1 | PO1<br>PO2 |
|----|----------|-----------------------------------------------------------------------------------------------------------------------------------|--------------------|----------|------------|------------|
|    | -)       | Healthcare by giving your own examples.                                                                                           |                    |          |            |            |
|    |          | (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        |
|    |          |                                                                                                                                   |                    |          |            |            |
| 2  | a)       | Write the applications of AI in Dantistry Orthonodies and                                                                         | 6 Marka            | τ2       | $CO^{2}$   |            |
| 3. | a)       | Ophthalmology in an elaborative manner.                                                                                           | 0 IVIAIKS          | LJ       | 002        | PO3        |
|    | b)       | Give an application of AI in dermatology by considering an                                                                        | 6 Marks            | L2       | CO2        | PO3        |
|    |          | example on your own.                                                                                                              |                    |          |            |            |
| 1  | a)       | (UK)<br>Describe briefly about the applications of AL in Psychiatry and                                                           | 6 Marka            | 12       | $CO^{2}$   | DOJ        |
| 4. | a)       | Cardiology.                                                                                                                       | 0 IVIAIKS          | L2       | 002        | 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                                                                  | 6 Marks            | L3       | CO3        | PO4        |
|    |          | Intelligence in health care.                                                                                                      |                    |          |            |            |
|    |          | (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                                                                    | 6 Marks            | L1       | CO3        | PO3        |
|    |          | AI technology to different healthcare applications.                                                                               |                    |          |            |            |
|    |          | (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<br>Intelligence technologies can be used in accessible diagnostic   | 6 Marks            | L2       | CO4        | PO3        |
|    |          | interigence technologies can be used in accessible diagnostic                                                                     |                    |          |            |            |

|    |    | (OR)                                                                                                                                                                        |         |    |     |     |
|----|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----|-----|-----|
| 8. | a) | What do you mean by Incentivized wellness and give a brief<br>explanation about AI technology can be used to increase<br>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<br>Diabetic foot Concerns and prioritization of referrals for<br>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 |

\$} \$ \$ Time: 3 hours

SREE VIDYANIKETHAN ENGINEERING COLLEGE

Roll No.

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

III B.Tech I Semester (SVEC14) Supplementary Examinations August - 2021

## STRUCTURAL ANALYSIS - II

[ Civil Engineering ]

Max. Marks: 70

SVEC-14

## 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 14 Marks 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.

## (OR)

2 Draw the ILD for shear force and bending moment for a section at 5m from the 14 Marks 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.

# UNIT-II

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



4 Analyse the continuous beam shown in figure using moment distribution method 14 Marks of analysis and Sketch the SFD and BMD. Given AB=CD=6m and BC=4m.







- **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 7 Marks unit length over the whole span.

(UNIT-IV)

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

(OR)

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

## UNIT-V

**9** Explain static and kinematic redundancy with examples. Determine static and 14 Marks kinematic redundancy for the following structures.



(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)

Roll No.

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

**SOIL MECHANICS** 

[ Civil Engineering ]

Max. Marks: 70

## **Answer One Question from each Unit** All questions carry equal marks

## UNIT-I

1 Describe the classification of Coarse grained Soils. 6 Marks a) Obtain the relationship between for the water content, void ratio, specific 8 Marks b) gravity and degree of saturation.

## (**OR**)

A sample of clay taken from a natural stratum was found to be partially 14 Marks 2 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<sup>3</sup>. Compute the degree of saturation, water content, porosity and void ratio using phase diagram.

## UNIT-II

3 What are the properties of the flow nets? 6 Marks a) A falling head permeability test was carried out on a 12.7cm long sample of 8 Marks b) 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. (**OR**)

In a deposit of silt, the water table which was at originally at a depth of 1m 4 14 Marks 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<sup>3</sup>. What is the change in effective pressure at a depth of 0.0m, 1.0m and 3.0m?

## UNIT-III)

- 5 a) Distinguish between Boussinesq's and Westergaard's theory of stress 6 Marks distribution in soils.
  - An annular ring footing of external and internal radii of 4m and 2m respectively 8 Marks b) transmits a pressure of 150kN/m<sup>2</sup>. Calculate the vertical stress at a depth of 1.0m and 2.0m below the centre.

## (OR)

6 Marks 6 Discuss the effect of compaction on properties of soil a) A soil in the borrow pit is at a dry density of 17kN/m<sup>3</sup> with moisture content of 8 Marks b) 10%. The soil is excavated from this pit and compacted in an embankment to a dry density of 18 kN/m<sup>3</sup> 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<sup>3</sup> of compacted soil in the embankment.

## UNIT-IV

- Differentiate between compaction and consolidation. 7 6 Marks a)
  - b) What is pre-consolidation pressure and describe the determination of pre-8 Marks consolidation pressure.

Time: 3 hours

SVEC-14

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<sup>2</sup>. Due to construction of a structure there is an increase in effective vertical stress of 40 kN/m<sup>2</sup> 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.



9 a) Explain the critical void ratio and pore pressure coefficients, in detail.
b) A cylindrical specimen of saturated soil fails under an axial stress 150 kN/m<sup>2</sup>
b) A cylindrical specimen of saturated soil fails under an axial stress 150 kN/m<sup>2</sup>
b) B Marks in an unconfined compression test. The failure plane makes an angle of 52° with the horizontal. Calculate the cohesion and angle of internal friction of the soil.

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- **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 8 Marks of silty clay:

| Normal pressure (kN/m <sup>2</sup> ) | 210 | 315 | 420 |
|--------------------------------------|-----|-----|-----|
| Shear stress (kN/m <sup>2</sup> )    | 115 | 142 | 171 |

Determine the cohesion and angle of shearing resistance.

\$} \$} \$

2

Time: 3 hours

Roll No.

## SREE VIDYANIKETHAN ENGINEERING COLLEGE

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

## **CONTROL SYSTEMS**

[Electrical and Electronics Engineering]

Max. Marks: 70

SVEC-14

## 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 6 Marks of block diagram.
  - b) What is block diagram? Explain all the rules used for block diagram reduction 8 Marks method.

## (OR)

a) Write the differential equations governing the mechanical system shown below. 10 Marks 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.



b) Write short notes on synchro transmitter.

4 Marks

3 a) Obtain the time response for First order system with respect to input test signals
b) Explain about generalized error constants in control systems.
6 Marks

(UNIT-II)

## (OR)

- 4 a) Derive the mathematical expression for delay time, rise time and settling time 7 Marks for the second order system.
  - b) The overall transfer function of a unity feedback control system is given by 7 Marks C(S) 10

 $\frac{C(S)}{R(S)} = \frac{10}{S^2 + 6S + 10}$ 

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 7 Marks whose open loop transfer function is  $G(s) = \frac{K}{s(s+1)(s+4)}$ .

(**OR**)

b) Discuss the applications of R-H criterion.

6

Draw the complete root locus of the system with  $G(s)H(s) = \frac{K(s+0.5)(s+2)}{s(s+1)(s-1)}$ , 14 Marks determine the range of K for which system is stable.

# UNIT-IV

7 The open loop transfer function of a unity feedback system is given by 14 Marks G(S) = 1/S(1+S) (1+2S). Sketch the Polar plot and determine the gain margin and phase margin.

## (OR)

8 Sketch the Bode plot and hence find Gain cross over frequency, Phase cross 14 Marks 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)

# UNIT-V

- 9 a) Construct state model for the fallowing differential equation 7 Marks  $3y_4+5y_3+6y_2+7y_1+4y_0 = 3u_0$ 
  - 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.
  b) Determine the State Controllability and Observability of the system using 7 Marks
  - Kalman's test.

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

CODE No.:14BT50301

Time: 3 hours

Roll No.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

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

## **DYNAMICS OF MACHINERY**

## [Mechanical Engineering]

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<br>100mm and 500mm respectively. The crank is rotating at 400 r.p.m. When the<br>crank has turned 30 <sup>o</sup> from the inner dead centre, find analytically:<br>i) Acceleration of the piston.<br>ii) Velocity of the piston.                                                                                                                                                                                                                    | 7 Marks  |
| 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?<br>The torque delivered by a two-stroke engine is represented by<br>$t = (1000 + 300 \text{ Sin } 2\theta - 500 \text{ Cos } 2\theta) \text{ N.m.}$ , where $\theta$ is the angle turned by the<br>crank from the inner-dead centre. The engine speed is 250 r.p.m. The mass of<br>the flywheel is 400 kg and radius of gyration is 400 mm. Determine:<br>(i) The power developed. (ii) The total percentage fluctuation of speed.<br><b>UNIT-III</b> | 7 Marks  |
| 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)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1436 1   |
| 0 |    | A multi-plate clutch has three pairs of contact surfaces. The outer and inner radii<br>of the contact surfaces are 150mm and 80mm respectively. The maximum axial<br>spring force is limited to 3 KN and the co-efficient of friction is 0.3. Assuming<br>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 7 Marks same in a porter governor.
  - b) The following data relate to a Hartnell governor M = 1.5 kg; a = 100 mm; 7 Marks 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.

## (OR)

8 a) Why is balancing necessary for rotors of high speed engines?
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.

# UNIT-V

9 a) Explain with sketches the different cases of damped vibrations.
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<sup>2</sup>. Determine the frequency of longitudinal and transverse vibration of the shaft.

# (OR)

a) What do you understand by 'torsionally equivalent shaft'?
b) Describe in detail the method of finding the frequency of torsional vibration of a 7 Marks two rotor system.

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# Roll No. Roll No. SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

## III B.Tech I Semester (SVEC14) Supplementary Examinations August - 2021

## **DESIGN OF MACHINE ELEMENTS-I**

[ Mechanical Engineering ]

Time: 3 hours

Max. Marks: 70

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

# UNIT-I

- 1 a) What are the factors to be considered for the selection of materials for the design 7 Marks of machine elements? Discuss.
  - b) What are preferred numbers? How will you find the numbers belonging to R10 7 Marks series?

## (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 7 Marks mechanical properties and applications of it.

# 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 7 Marks stress. The corrected endurance limit of the bar is 315 N/mm<sup>2</sup> .Calculate the fatigue strength of the bar for a life of 90,000 cycles.

## (OR)

4 A transmission shaft carries a pulley between two bearings. The bending 14 Marks 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<sub>ut</sub> =540 N/mm<sup>2</sup>, S<sub>yt</sub>=400 N/mm<sup>2</sup>). The corrected endurance limit of the shaft is 200 N/mm<sup>2</sup>. Determine the diameter of the shaft using a factor of safety of 2.

# UNIT-III

- What is meant by the efficiency of the riveted joint? 4 Marks 5 a) Determine the efficiency of a double riveted, chain lap joint used to join 6mm 10 Marks b) 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. (OR)Discuss various ways in which a riveted joint may fail. 6 Marks 6 a) Two plates of 10mm thick are joined by means of a single riveted, double strap b) 8 Marks butt joint. The rivet diameter is 20mm and pitch of the rivets is 60mm. The
  - permissible stresses are:  $\sigma_t = 80$  MPa,  $\sigma_c = 120$  MPa,  $\tau = 60$  MPa. Calculate the efficiency of the joint.

# UNIT-IV

- 7 a) How are the keys classified? Draw neat sketches of different types of keys and 7 Marks state their applications.
  - b) A solid circular shaft is subjected to a bending moment of 3000 N-m and a 7 Marks 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.

## (OR)

**8** a) How do you classify shaft couplings?

b) Design a muff coupling for a shaft transmitting 30kW at 300 r.p.m. The material 10 Marks 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.

# UNIT-V

9 a) What are the applications of a cotter joints?4 Marksb) 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 14 Marks 75 MPa in tension, 60 MPa in shear and 150 MPa in compression.

## \$P \$P \$P

4 Marks

| COD  | E No.    | :14BT50401                                                                                                                                                                                                                                                           | SVEC-14            |
|------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
|      |          | Roll No.                                                                                                                                                                                                                                                             |                    |
|      |          | SREE VIDYANIKETHAN ENGINEERING COLLEGE<br>(An Autonomous Institution, Affiliated to JNTUA, Anantapur)                                                                                                                                                                |                    |
|      | I        | II B.Tech I Semester (SVEC14) Supplementary Examinations August – 2                                                                                                                                                                                                  | 2021               |
|      |          | ANTENNAS AND PROPAGATION<br>[Electronics and Communication Engineering]                                                                                                                                                                                              |                    |
| Time | : 3 ho   | ours Max.                                                                                                                                                                                                                                                            | Marks: 70          |
|      |          | Answer One Question from each Unit<br>All questions carry equal marks                                                                                                                                                                                                |                    |
|      |          | UNIT-I                                                                                                                                                                                                                                                               |                    |
| 1    |          | Briefly explain the following terms related to antenna:<br>(i) Antenna apertures.<br>(ii) Patterns.<br>(ii) Radiation resistance.<br>(iv) Beam width.<br>(OR)                                                                                                        | 14 Marks           |
| 2    | a)<br>b) | Explain about the current distributions of half wave dipole.<br>The maximum radiation intensity of 96% efficiency antenna is 180mW/unit solid angle. Find the directivity and gain (dB), when the:<br>(i) input power is 125.66 mW. (ii) radiated power is 125.66mW. | 6 Marks<br>8 Marks |
| 3    | a)       | For a 10-element binomial array with spacing of $\lambda/2$ between the elements.                                                                                                                                                                                    | 8 Marks            |
|      | b)       | Briefly explain the concept of scanning arrays.<br>(OR)                                                                                                                                                                                                              | 6 Marks            |
| 4    | a)       | Explain binomial array.                                                                                                                                                                                                                                              | 8 Marks            |
|      | b)       | Distinguish between binomial and uniform linear arrays.                                                                                                                                                                                                              | 6 Marks            |
| 5    | a)       | What is Yagi-Uda antenna? Explain its construction and properties with special                                                                                                                                                                                       | 8 Marks            |
|      | 1-)      | reference to the directivity, bandwidth and impedance.                                                                                                                                                                                                               | ( Maular           |
|      | D)       | (OR)                                                                                                                                                                                                                                                                 | o Marks            |
| 6    | a)<br>b) | Discuss the design considerations for monofilar helical antenna in axial mode.<br>With neat diagram, explain the geometry of parabolic reflector.                                                                                                                    | 7 Marks<br>7 Marks |
| 7    |          | Explain the techniques used for measuring the directivity in detail.                                                                                                                                                                                                 | 14 Marks           |
| 8    |          | Explain the concept of Zoning and specify the tolerances of zoned and un-zoned nonmetallic dielectric lens antennas.                                                                                                                                                 | 14 Marks           |
| 0    |          | UNIT-V                                                                                                                                                                                                                                                               |                    |
| 9    | a)       | Derive expression for the field strength, due to space wave propagation at a point away from the transmitter.                                                                                                                                                        | 7 Marks            |
|      | D)       | (OR)                                                                                                                                                                                                                                                                 | / Marks            |
| 10   | a)       | Explain the terms wave tilt, virtual height, MUF, Skip distance and critical frequency                                                                                                                                                                               | 7 Marks            |
|      | b)       | Derive an expression for the refractive index of the ionosphere in terms of 'N' and frequency.                                                                                                                                                                       | 7 Marks            |
|      |          | \$ \$ \$                                                                                                                                                                                                                                                             |                    |

**CODE No.:14BT50405** 

Time: 3 hours

SVEC-14 Roll No.

# SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

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

## **PULSE AND DIGITAL CIRCUITS**

[Electronics and Communication Engineering]

Max. Marks: 70

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

|    | UNIT-I   |                                                                                                                                                                                                                                            |                    |  |  |  |  |
|----|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--|--|--|--|
| 1  | a)<br>b) | Explain the operation of parallel RLC circuit and its response to a step input.<br>Explain the operation of high-pass RC circuit with different time constants compared to input pulse width. Draw the input and output waveforms.<br>(OR) | 7 Marks<br>7 Marks |  |  |  |  |
| 2  | a)<br>b) | Explain ringing circuit, and attenuator.<br>Explain the application of an attenuator as CRO probe.                                                                                                                                         | 7 Marks<br>7 Marks |  |  |  |  |
| 3  | a)       | Explain the following terms pertaining to transistor switching times.<br>i) Rise time. ii) Delay time. iii) Storage time.                                                                                                                  | 9 Marks            |  |  |  |  |
|    | b)       | Explain synchronized clamping.                                                                                                                                                                                                             | 5 Marks            |  |  |  |  |
|    |          | (OR)                                                                                                                                                                                                                                       |                    |  |  |  |  |
| 4  | a)<br>b) | Explain positive and negative clippers with neat circuit diagrams and waveforms.<br>Explain the effects of diode characteristics on clamping voltage.                                                                                      | 7 Marks<br>7 Marks |  |  |  |  |
|    |          | (UNIT-III)                                                                                                                                                                                                                                 |                    |  |  |  |  |
| 5  |          | Draw and explain the circuit of Collector-Coupled Monostable Multivibrator<br>with necessary waveforms and also derive the expression for pulse width.                                                                                     | 14 Marks           |  |  |  |  |
| 6  | a)       | Discuss in detail about Transistor switching times with relevant diagrams                                                                                                                                                                  | 6 Marks            |  |  |  |  |
| 0  | b)       | Design a Collector-Coupled Astable multivibrator with frequency 1KHz,<br>$h_{FE} = 50, 1c(sat) = 5mA, V_{CE(sat)} = 0.2, V_{cc} = 12$ . Assume $R_1 = R_2, C_1 = C_2$                                                                      | 8 Marks            |  |  |  |  |
|    |          | (UNIT-IV)                                                                                                                                                                                                                                  |                    |  |  |  |  |
| 7  | a)       | Define the following:                                                                                                                                                                                                                      | 6 Marks            |  |  |  |  |
| ,  | u)       | i) Sween-speed error ii) Displacement error iii) Transmission error                                                                                                                                                                        | 0 marks            |  |  |  |  |
|    | b)       | Explain the principle and working of a transistor Bootstrap time-base generator.<br>( <b>OR</b> )                                                                                                                                          | 8 Marks            |  |  |  |  |
| 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<br>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.<br>(OR)                                                                                                                                                                                        | 8 Marks            |  |  |  |  |
| 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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CODE No.:14BT51003

# Roll No. \_\_\_\_\_

SVEC-14

Max. Marks: 70

(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

# Answer One Question from each Unit

All questions carry equal marks

# UNIT-I

| 1  | a)<br>b)  | Distinguish between practical and ideal op-amp. Draw its equivalent circuit.<br>With the help of suitable examples, explain how the Slew Pate affects the | 7 Marks<br>7 Marks |
|----|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
|    | 0)        | frequency response of an on amp                                                                                                                           | / WIAIKS           |
|    |           | (OR)                                                                                                                                                      |                    |
| 2  | a)        | Define the following terms:                                                                                                                               | 4 Marks            |
|    |           | i) Input bias current. ii) Input offset voltage.                                                                                                          |                    |
|    | b)        | Explain the frequency compensation technique in an op-amp.                                                                                                | 10 Marks           |
|    |           | UNIT-II                                                                                                                                                   |                    |
| 3  | a)        | 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. (OR)                                                                             | 6 Marks            |
| 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            |
| Q  | a)        | (UR)<br>Explain the following terms with reference to CMOS logic:                                                                                         | 6 Marka            |
| 0  | <i>a)</i> | i) Logic levels ii) Power supply rails                                                                                                                    | 0 Iviai KS         |
|    | b)        | Briefly explain about CMOS/TTL interfacing                                                                                                                | 8 Marks            |
|    | -)        |                                                                                                                                                           |                    |
| 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            |
|    |           |                                                                                                                                                           |                    |
|    |           | 1                                                                                                                                                         |                    |

CODE No.:14BT51202 SVEC-14 Roll No. SREE VIDYANIKETHAN ENGINEERING COLLEGE (An Autonomous Institution, Affiliated to JNTUA, Anantapur) **III B.Tech I Semester (SVEC14) Supplementary Examinations August – 2021** SOFTWARE ENGINEERING [ Computer Science and Engineering, Information Technology, **Computer Science and Systems Engineering** Time: 3 hours Max. Marks: 70 **Answer One Question from each Unit** All questions carry equal marks UNIT-I 1 Explain the changing nature of the software. 7 Marks a) Sketch and explain about a software process framework. 7 Marks b) (**OR**) Describe scrum process model with neat diagram. 2 7 Marks a) Explain the prototyping process model with a neat diagram. 7 Marks b) UNIT-II What are the difficulties in Elicitation? 3 a) 4 Marks b) Design Interaction model for word processor. 10 Marks (**OR**) Explain the requirements management principles and procedures. 7 Marks 4 a) b) What is System Modeling? List out and briefly explain various models. 7 Marks (UNIT-III) Explain Re-engineering process model with a neat sketch. 5 7 Marks a) Define software Architecture. Why is architecture important? Explain. 7 Marks b) (**OR**) 6 Explain in-detail about Architectural Patterns. 7 Marks a) Write the steps involved in interface design. 7 Marks b) UNIT-IV Define debugging. Explain the process of debugging. 9 Marks 7 a) Write short notes on White box testing technique. 5 Marks b) (**OR**) What are the various testing strategies for conventional software? 8 9 Marks a) Differentiate between verification and validation. 5 Marks **b**) UNIT-V Compare and contrast reactive and proactive risk strategies. 7 Marks 9 a) Briefly write about software Reliability. 7 Marks b) (**OR**) Write short notes on RMMM. 7 Marks 10 a) Define Quality and write about quality concepts. 7 Marks b)

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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

## **PROFESSIONAL ETHICS**

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

Time: 3 hours

8

9

## **Answer One Question from each Unit** All questions carry equal marks

Max. Marks: 70

# UNIT-I

- Briefly explain the general types of enquiries involved in engineering 1 a) 6 Marks inspection.
  - What is meant by professional conscience and right of conscientious refusal? 8 Marks b) (**OR**)
- Why is it important to study the subject of professional ethics? 6 Marks 2 a) How did Gilligum view the three levels of moral development initiated by b) 8 Marks Kholbuerg?

# 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     | 8 Marks |

How do the different ways and means of the "code of ethics" help the D) 8 Marks Engineers?

# UNIT-IV

7 List the rights conferred on citizen in the constitution. 6 Marks a) Explain the concept of whistle blowing and the conditions expected for whistle b) 8 Marks blowing.

## (**OR**)

Explain the respect for authority in detail. 6 Marks a) List the advantages and limitations of collective bargaining. 8 Marks b)

# UNIT-V

"Engineers shine better as managers". Discuss. a) What is known as technology transfer? Why is it so critical in defence / 8 Marks b) aerospace industries?

## (**OR**)

"Engineers in weapon development" - Discuss 8 Marks **10** a) Describe the ethics related to multinational corporations. 6 Marks b)

6 Marks

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(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

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

### **SOIL MECHANICS**

[ Civil Engineering ]

Max. Marks: 70

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

### UNIT-I

- Describe different types of soil structure. 5 Marks 1 a) 9 Marks b) A partially saturated soil sample has a volume of 6  $\times 10^{-5}$  m<sup>3</sup> 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. (**OR**) Differentiate between the submerged unit weight and saturated unit weight. 2 5 Marks a) b) Describe I.S classification of soils. 9 Marks UNIT-II ) 3 What are the properties of the flow nets? 6 Marks a) A falling head permeability test was carried out on a 12.7cm long sample of silty 8 Marks b) 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. (**OR**) In a deposit of silt, the water table which was at originally at a depth of 1m below 4 14 Marks 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<sup>3</sup>. What is the change in effective pressure at a depth of 0.0m, 1.0m and 3.0m? (UNIT-III) State the assumptions of Boussinesq's theory of stress distribution in soils. 4 Marks 5 a) Derive an expression for a vertical stress below the centre of circular area b) 10 Marks supporting a uniformly distributed load at the surface. Use bousinesq's theory. (**OR**) What is compaction curve and describe zero-air void curve with a sketch. 6 6 Marks a) Explain how field control of compaction soil is achieved. Describe at least one 8 Marks b) example in each case. UNIT-IV) 7 Explain briefly Terzaghi's theory of one dimensional consolidation and derive its 14 Marks equation. (**OR**) Define: 6 Marks 8 a) i) Preconsolidation pressure. ii) Compression index. iii) Degree of saturation. iv) Coefficient of consolidation. The liquid limit of a normally consolidated clay sample is 58%. At a stress of b) 8 Marks 100kN/m<sup>2</sup>, the void ratio is 1.05. Calculate the void ratio if the stress is increased to 200kN/m<sup>2</sup>. If the clay year thickness is 5m, what is the total settlement?
  - 1

Time: 3 hours

# 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 <sup>2</sup> in an unconfined compression test. The failure plane makes an angle of $52^{\circ}$ with the | 8 Marks |
|    |    | horizontal. Calculate the cohesion and angle of internal friction of the soil.                                                                                                            |         |
|    |    | (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 |
|    |    | ନ୍ତି ନି                                                                                                                                                                                   |         |

(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 6 Marks of block diagram.
  - b) What is block diagram? Explain all the rules used for block diagram reduction 8 Marks method.

#### (OR)

a) Write the differential equations governing the mechanical system shown below. 10 Marks 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.



b) Write short notes on synchro transmitter.

4 Marks

### UNIT-II)

- 3 a) Find K<sub>p</sub>, K<sub>v</sub> and K<sub>a</sub> for the open-loop transfer function of a unity feedback system 4 Marks given by  $G(s) = \frac{10}{s(0.1s+1)}$ 
  - b) Derive the expressions for time domain specifications  $\mathbf{t_r}$ ,  $\mathbf{t_p}$ , max peak overshoot 10 Marks for under damped second order system with unit step input.

#### (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 6 (s) H(s) =  $\frac{K}{s(s+3)(s^2+2s+2)}$ 

Sketch the root locus as 'K' varies from 0 to  $\infty$ .

#### (OR)

SVEC-14

- 6 a) Sketch the root locus plot of a unity feedback system with an open loop transfer 8 Marks function  $G(s) = \frac{K}{s(s+2)(s+4)}$ .
  - b) Discuss the effect of addition of poles and zeros to the open loop transfer 6 Marks function.

### UNIT-IV

- 7 a) The open loop transfer function of a unity feedback control system is given below 8 Marks  $G(s) = \frac{50}{S(S+5)}$ . Draw the Nyquist plot and comment on the stability of the closed loop system.
  - b) A second order system has overshoot of 50% and period of oscillation 0.2s in step 6 Marks response. Determine resonant peak, resonant frequency and bandwidth.

#### (**OR**)

8 a) Derive expressions for Resonant peak magnitude and resonant frequency.
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 $3y_4+5y_3+6y_2+7y_1+4y_0$                  | 7 Marks |
|----|----|-----------------------------------------------------------------------------------------------------------|---------|
|    |    | $= 3u_{0.}$                                                                                               |         |
|    | 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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Time: 3 hours

### 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]

romes Engineering J

Max. Marks: 70

6 Marks

### 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,  $3-\Phi$  line whose 7 Marks conductors are situated at the corners of a regular hexagon.
  - b) A 25000 KVA, 13.8 KV generator has sub transient reactance of 0.2 p.u. and is 7 Marks connected to a transmission line through a transformer rated 30000 KVA, 13.8  $\Delta$  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?

#### (OR)

- **2** a) Derive an expression for p.u. impedance of a given base MVA and base KV in 5 Marks terms of new base MVA and new base KV.
  - b) The conductors of a 3-Φ line are placed at the corners of an equilateral triangle. 9 Marks 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.

### UNIT-II

- 3 a) A 60Hz, 250km line has an impedance of  $(33+j104)\Omega$  and admittance of 7 Marks  $10^{-3}\Omega$ . 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  $\pi$  model.
  - b) A 3-phase, 50Hz transmission line is 250km long. The load is 125MW 7 Marks operating at 220KV upf. Evaluate the incident and reflected voltages at receiving end.  $R = 0.172 \Omega/km$ , L=2.1mH/km and C=0.01µF/km.

### (OR)

- 4 a) Derive the ABCD constants for a medium transmission line which can be 8 Marks analyzed using nominal  $\pi$  method.
  - b) Using a nominal  $\pi$  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 0.11 $\Omega$ /km.

### (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.
  - b) A surge of 200KV traveling on a line of natural impedance  $500\Omega$  arrives at a gunction with two lines of impedances  $700\Omega$  and  $300\Omega$  respectively. Find the surge voltages and currents transmitted into each branch line. Also find the reflected surge voltage and current.

### UNIT-IV)

- 7 Discuss the phenomenon of corona and corona loss and indicate the 7 Marks a) circumstances under which they are likely to occur.
  - Calculate the disruptive critical voltage for a  $3-\Phi$  overhead line which has three b) 7 Marks 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°C. The breakdown strength of air is 21KV rms/cm.

### (**OR**)

- What are the types of insulators? 8 a)
  - A string of 5 suspension insulators is connected across 100KV line. Calculate b) 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.

### UNIT-V

9 The towers of height 30mt and 90mt respectively support a transmission line 14 Marks 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.

### (**OR**)

- 10 a) Explain about different types of grading of cables.
  - Determine the insulation resistance of a single core cable of inside diameter 5 Marks b) 0.03m, outside diameter 0.075m and length 2km. The resistivity of insulating material being 6 x  $10^{12} \Omega$ -m.

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10 Marks

9 Marks

(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

3

### **Answer One Question from each Unit** All questions carry equal marks

## UNIT-I

The crank and connecting rod of a steam engine are 0.3m and 1.5m in length. The 1 14 Marks crank rotates at 180 r.p.m. clockwise. Determine the velocity and acceleration of piston when the crank is at 40° from the inner dead centre position. Also determine the position of the crank for zero acceleration of the piston.

### (**OR**)

2 A petrol engine with a speed of 3000 r.p.m. has a stroke of 8.75cm. The weight of 14 Marks 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<sup>°</sup> with I.D.C. Also find inertia torque on the crank shaft.

## UNIT-II )

- Explain the effect of Gyroscopic couple on a Naval ship during pitching. 7 Marks a) 7 Marks b)
  - Explain the effect of Gyroscopic couple on a Aero plane.

#### (OR)

4 List out the few machines in which flywheel are used. 7 Marks a) What is the function of a flywheel? How does it differ from that of a governor? 7 Marks b) delivered by a two-stroke engine is represented by The toraue t=  $(1000 + 300 \text{ Sin } 2\boldsymbol{\vartheta} - 500 \text{ Cos } 2\boldsymbol{\vartheta})$  N.m where  $\boldsymbol{\vartheta}$  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)

- 1. A cone clutch with one cone angle 20° is to transmit 7.5kw at 750 r.p.m. The 5 14 Marks normal intensity of pressure between the contact faces is not to exceed 0.12N/mm<sup>2</sup>. The coefficient of friction is 0.2. If face width is 1/5th of mean diameter, find;
  - i) The main dimensions of the clutch.
  - ii) Axial force required while running.

### (**OR**)

A multi-plate clutch has three pairs of contact surfaces. The outer and inner radii 6 14 Marks 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.

Max. Marks: 70

2

# Derive the expression for critical speed of shaft with a single disc considering

#### ද්මු ද්මු ලි

- 9 A cylinder of mass M and radius R rolls without slipping on a cylindrical surface 14 Marks of radius R. Find the natural frequency for small oscillations about the lowest position. (**OR**)
  - damping.

UNIT-V

In a porter governor the upper and lower arms are each 200mm long and are each

inclined at  $30^{\circ}$  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

UNIT-IV

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**)

Distance of fulcrum of each bell crank lever from the axis of rotation= 9cm

The following particulars refer to the Hartnell type of governor.

14 Marks

14 Marks

6 Marks

8 Marks

Length of bell crank lever arms vertical = 10cm Length of bell crank lever arms horizontal = 5 cm

is 36mm, find the range of speed of the governor.

Explain whirling speed of shaft.

Weight of each ball = 20 N

7

8

10 a)

b)

(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

6

#### **Answer One Question from each Unit** All questions carry equal marks

### UNIT-I

- 1 Explain the importance of manufacturing considerations in the design process. 7 Marks a) Define "mechanical properties of an engineering material". State any six 7 Marks b) mechanical properties and applications of it. (**OR**) 2 What are the steps to be followed while designing a machine element? 7 Marks a) Define the following properties of a material: 7 Marks b)
  - i) Ductility. ii) Toughness. iii) Hardness. iv) Creep.

### UNIT-II)

- What is meant by endurance strength of a material? How do the size and 3 a) 4 Marks Surface condition of a component and type of load and effect such strength?
  - A circular bar of 500mm length is supported freely at its two ends. It is acted 10 Marks b) 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.

#### (**OR**)

- 4 Formulate Soderberg's equation and state its application to different types of 6 Marks a) loading.
  - b) A 50mm diameter shaft is made from carbon steel having ultimate tensile 8 Marks 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.

### (UNIT-III)

- Discuss the bolt of uniform strength in detail. 5 a)
  - A steam engine cylinder has an effective diameter of 350mm and the maximum 7 Marks b) steam pressure acting on the cylinder cover is 1.25N/mm<sup>2</sup>. Calculate the number and size of studs required to fix the cylinder cover, assuming the permissible stress in the studs as 33MPa.

#### (**OR**)

Discuss various ways in which a riveted joint may fail. 6 Marks a) Two plates of 10mm thick are joined by means of a single riveted, double strap 8 Marks b) butt joint. The rivet diameter is 20mm and pitch of the rivets is 60mm. The permissible stresses are:  $\sigma_t = 80$ MPa,  $\sigma_c = 120$ MPa,  $\tau = 60$ MPa. Calculate the efficiency of the joint.

Max. Marks: 70

7 Marks

### UNIT-IV

6 Marks

4 Marks

- 7 a) Prove that a square key is equally strong is shear and compression
  b) A standard splined connection 8 x 36 x 40 is used for a gear and shaft assembly
  - b) A standard splined connection 8 x 36 x 40 is used for a gear and shaft assembly 8 Marks 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<sup>2</sup>. Calculate the power that can be transmitted form gear to shaft.

### (OR)

8 a) How do you classify shaft couplings?

b) Design a muff coupling for a shaft transmitting 30kW at 300 r.p.m. The material 10 Marks 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.

### 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 |

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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 | 7 Marks |
|   |    | and hence its radiation resistance.                                            |         |
|   |    | (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 |
|   | ŕ  | (OR)                                                                           |         |
|   |    |                                                                                |         |

4 a) Explain binomial array.8 Marksb) 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 | 7 Marks |
|   |    | antenna, listing out its length and spacing requirements.               |         |
|   |    | (OP)                                                                    |         |

#### (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 14 Marks method.

#### (**OR**)

- **8** a) Explain the 3 antenna method of measurement of the gain of a horn antenna 8 Marks with necessary relations.
  - 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 7 Marks point away from the transmitter.
  - 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 7 Marks frequency.
  - b) Derive an expression for the refractive index of the ionosphere in terms of 'N' 7 Marks

and frequency.

### \$P \$P \$P

Time: 3 hours

### 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]

|    |    | Answer One Question from each Unit<br>All questions carry equal marks                                       |          |
|----|----|-------------------------------------------------------------------------------------------------------------|----------|
|    |    | UNIT-I                                                                                                      |          |
| 1  |    | Explain various TTL logic familiars.                                                                        | 14 Marks |
| 2  | a) | (OR)<br>What kinds of transistors are used in CMOS gates and draw the 2 input XOR<br>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 $\times$ 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 |

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Max. Marks: 70

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

### PULSE AND DIGITAL CIRCUITS

[Electronics and Communication Engineering]

Time: 3 hours

explain.

### **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                                      | 7 Marks        |
|   |     | clamping circuit? Explain with neat sketches.                                                                |                |
|   |     | 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                                 | 7 Marks        |
|   |     | and 50 msec OFF period for $V_{CC} = 18V$ , $h_{FE} = 60$ , $I_{C \text{ (sat)}} = 100 \mu\text{A}$ .        |                |
|   |     | (OR)                                                                                                         |                |
| 6 | a)  | Explain the working of collector coupled astable multivibrator with circuit                                  | 7 Marks        |
|   | 1.) | diagram and wave forms.                                                                                      | 7 Maulaa       |
|   | D)  | Explain the use of a monostable relaxation circuit as a frequency divider with                               | / Marks        |
|   |     | the help of heat diagram and wave forms.                                                                     |                |
|   |     | UNIT-IV                                                                                                      |                |
| 7 |     | Write notes on the following:                                                                                | <b>5</b> ) ( 1 |
|   |     | 1) Differentiate voltage and current time based generators.                                                  | 7 Marks        |
|   |     | 11) Monostable blocking oscillators.                                                                         | / Marks        |
| 8 | a)  | Draw transistor Bootstran time base generator and explain its operation                                      | 7 Marks        |
| U | b)  | Which type of time base generator is used in electromagnetic and electrostatic                               | 7 Marks        |
|   | 0)  | deflection systems? Explain.                                                                                 | , 101001110    |
|   |     |                                                                                                              |                |
| 0 |     |                                                                                                              |                |
| 9 | a)  | What is Pedestal? How can pedestal be reduced in a sampling gate circuit?                                    | 7 Marks        |
|   | D)  | Draw the circuit of an emitter-coupled bidirectional sampling gate and                                       | / Marks        |

Max. Marks: 70

- (OR)
  - 1

- Sketch and explain the working of CMOS inverter Realize OR gate using diodes and transistors. 10 a)
  - b)

7 Marks 7 Marks

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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

- 14 Marks 1 Let L be a set accepted by a NFA and then prove that there exists DFA that accepts L.
- (**OR**) Design a NFA accepts the following strings over the alphabets {0.1} The set of 2 14 Marks all string that beings with 01 and ends with 11. Check for the validity of 01111 and 0110 strings.

#### UNIT-II Let L be any subset of 0\*. Prove that L\* is regular. 3 (**OR**)

Construct regular expression equivalent to the following DFA. 4 14 Marks



### UNIT-III

| 5 | Find a CFG equivalent with no useless symbols equivalent to | 14 Marks |
|---|-------------------------------------------------------------|----------|
|   | $S \rightarrow AB \mid CA$ $A \rightarrow a$                |          |
|   | $B \rightarrow BC \mid AB$ $C \rightarrow aB \mid b$        |          |
|   | (OR)                                                        |          |
| 6 | Construct a PDA equivalent to the following grammar.        | 14 Marks |
|   | $S \rightarrow aAA$                                         |          |
|   | $A \rightarrow aS  bS a$                                    |          |

### 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**)
- Prove that the union of two recursive languages is recursive and the union of 10 14 Marks two recursively enumerable languages is recursively enumerable.

ନ୍ଦ୍ରେ ද්මු ලි 14 Marks

Time: 3 hours

### 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 ]

Max. Marks: 70

### **Answer One Question from each Unit** All questions carry equal marks

### (UNIT-I)

| 1  | a)<br>b)   | Comment on "UNIX system has become more popular now-a-days".<br>Give brief description about the UNIX file subsystem. | 7 Marks<br>7 Marks |
|----|------------|-----------------------------------------------------------------------------------------------------------------------|--------------------|
| 2  | a)         | (OR) 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.<br>(OR)                                                     | 7 Marks            |
| 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            |
| 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.                                                                           | 7 Marks            |
|    | <b>b</b> ) | i) Kill. ii) Raise. iii) Alarm. iv) Pause.                                                                            | 7 Martra           |
|    | D)         | Explain the use of read and write Locks in files with an example program.                                             | / Warks            |
| 0  | a)         | (OR)                                                                                                                  | 7 Martra           |
| 0  | a)<br>b)   | Discuss about Mandatory locking.                                                                                      | 7 Marks<br>7 Marks |
|    | -)         |                                                                                                                       |                    |
|    |            |                                                                                                                       |                    |
| 9  |            | Write short notes for the following:                                                                                  | 14 Marks           |
|    |            | iii) Socket communications. iv) Process pipes.                                                                        |                    |
|    |            | (OR)                                                                                                                  |                    |
| 10 |            | Write the significance for the following:                                                                             | 14 Marks           |

(i) msgget. (ii) msgsnd. (iii) msgctl. (iv) shmget. (v) shmat. (vi) pipe call.

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(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

### **Answer One Question from each Unit** All questions carry equal marks

### UNIT-I

- 1 Define the following: a)
  - i) Slew Rate. ii) PSRR. iii) Thermal drift.

Operational amplifier has differential gain of 80 dB and CMRR of 100 dB. 8 Marks b) If  $V_1 = 2\mu V$  and  $V_2 = 1.6\mu V$ , then calculate output voltages for differential and common-mode input signal operations.

#### (**OR**)

2 List the characteristics of an ideal op-amp. 4 Marks a) Explain in detail about the AC characteristics of an op-amp. b) 10 Marks

- UNIT-II
- 3 a) Explain Current to Voltage converter. 7 Marks Design an integrator to integrate a square wave of +/- 5V with a frequency of 7 Marks b) 3KHz. Draw the input and output waveforms.

#### (**OR**)

4 Derive the transfer function and magnitude for a low pass first order filter. 7 Marks a) Design a Schmitt trigger for an upper threshold voltage of 4V and lower 7 Marks b) threshold voltage of -2V for saturated voltages of +/- 14V.

### UNIT-III)

List out the applications of PLL and explain any two applications. 5 7 Marks a) Design a 555 timer astable multivibrator operating at 20 KHz with 40% duty b) 7 Marks cycle.

### (**OR**)

- Explain the operation of dual slope A/D converter. 7 Marks 6 a) Draw and explain VCO working principle and derive a equation for its free 7 Marks b)
  - running.

### UNIT-IV)

Explain low voltage CMOS logic and interfacing. 7 Marks 7 a) Realize the Boolean function [(AB+CD) E]' using CMOS logic. 7 Marks b) (**OR**) Discuss the steady state behavior of CMOS devices. 8 7 Marks a) Realize XOR gate using ECL logic. Explain. b) 7 Marks

### UNIT-V

- Design a full adder using gate level modeling. 7 Marks 9 a) Explain various data types of Verilog HDL in detail. b) 7 Marks (**OR**)
- Explain blocking and non-blocking statements with example. **10** a) 7 Marks

6 Marks

Max. Marks: 70

b) Using two 8:1 MUX design and implement a 16:1 Multiplexer in Verilog HDL. 7 Marks

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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 CO1 14 Marks with every fall in price and vice-versa. UNIT-II 3 Define Cost. Explain different types of Costs. CO3 14 Marks (**OR**) 14 Marks Determine, i) BEP CO2, 4 Sales required to earn a profit of Rs.40,000 CO5 ii) iii) BEP, when fixed cost increases by Rs.10,000 BEP when variable cost increases by Rs.20/unit. iv) Selling Price /unit Rs.200 Variable Cost/unit **Rs.50** Fixed Cost Rs.1,00,000 UNIT-III) Explain Monopoly competition features. Explain price and output CO3 5 14 Marks determination both in Short run and Long run. (**OR**) Define Market. Explain the different types of Market. 6 CO3 14 Marks UNIT-IV From the following transactions pass necessary journal entries in the CO2, 14 Marks 7 books of Raghava. CO3. 2018 CO6 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.

#### (OR)

8 Discuss briefly various sources of capital for a business. CO1 14 Marks

|   |          | _ |
|---|----------|---|
| r | LINITT V |   |
|   | UNLI-    | • |
|   |          |   |

9 From the following particulars prepare trading and profit and loss account CO4, and balance sheet as on 31.3.2019 of Mr.Rakesh. CO5,

1

4, 14 Marks

CO6

| 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, 14 Marks CO2

\$P \$P \$P

questions :

### 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

### 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 CO2 14 Marks they useful today as they were then? Why or why not? When are they most and least useful?

#### (OR)

2 If you learned that a company had a matrix structure, would you be more CO3 14 Marks or less interested in working there? Explain your answer. How would you prepare yourself to work effectively in a matrix organization?

### 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<br>automobile generators directly from the supplier. The company's generator<br>production which is operated at a constant rate will need 1,000<br>components per month throughout the year. If ordering costs are Rs<br>2,500 per order, unit cost is Rs 3.00 per component and annual inventory<br>holding costs are charged at 20%, answer the following inventory policy | CO4 | 7 Marks |

- 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?
- 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 CO1 7 Marks strange its status is not recognized and respected. Place yourself in the role of a HR manager. How would you reverse the trend?
  - 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

Max. Marks: 70

# UNIT-IV

CO6 14 Marks

|          | (Estimated                           | imated duration of activity (in weeks) |                                      |  |  |
|----------|--------------------------------------|----------------------------------------|--------------------------------------|--|--|
| Activity | Optimistic<br>Time (t <sub>0</sub> ) | Most likely<br>time(t <sub>m</sub> )   | Pessimistic<br>time(t <sub>p</sub> ) |  |  |
| 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                                    |  |  |

The activities of a project and their time estimates are given below:

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 CO5 14 Marks maintenance strategies and explain the techniques of managing work environment.

#### (OR)

- 10 a) Differentiate between Total Quality Management (TQM) and Six Sigma CO6 7 Marks concepts.
  - b) Describe the steps involved in Material requirement planning. CO1 7 Marks

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#### 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 CO4 14 Marks estimates.

### UNIT-II)

3 The following was the expenditure on a contract for Rs.8,00,000 CO4 14 Marks commenced in January 2018:

| Materials               | Rs. 1,50,000 |
|-------------------------|--------------|
| Wages                   | Rs. 1,64,000 |
| Plant                   | Rs. 22,000   |
| <b>Business</b> 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%.

#### (OR)

4 Define Contract Costing. List out the costs not attributable to contract CO1 14 Marks account.

### 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 |
|    | \$P \$P \$P                                                         |     |          |

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

### **PYTHON PROGRAMMING**

#### [Computer Science and Systems Engineering]

Time: 3 hours

### **Answer One Question from each Unit** All questions carry equal marks



- 1 Write notes on Python Standard Library. a)
  - Write a Python program that allows the user to enter two integer values CO1 b) 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 = 127 - 5 = 27 \* 5 = 357/5 = 1.407 / / 5 = 17%5 = 27 \*\* 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.

#### (**OR**)

- Algorithms and computers are a "perfect match". Justify. 2 a) CO2 6 Marks
  - List and describe the capabilities an Integrated Development Environment CO1 8 Marks b) (IDE) should provide.

### UNIT-II )

- Illustrate selection and iterative control statements with suitable examples. 3 a) CO1 8 Marks
  - Write a program that sums a series of (positive) integers entered by the CO1 b) 6 Marks user, excluding all numbers that are greater than 100.

#### (OR)

Write a Python program that prompts the user to enter types of fruit and 4 CO3. 7 Marks a) how many pounds of fruit there are for each type. The program should CO4. then display the information in the form fruit, weight listed in alphabetical CO5 order, one fruit type per line as shown below,

Apple, 6 lbs.

Banana, 11 lbs. etc.

Give a program segment that creates an initially empty dictionary named b) CO3. 7 Marks password lookup, prompt-ing one-by-one for usernames and passwords CO5 (until a username of 'z' is read) entering each into the dictionary.

### (UNIT-III)

- Briefly describe the following types of function arguments: 5 CO2 14 Marks
  - i) Actual Arguments vs. Formal Parameters.
  - ii) Mutable vs. Immutable Arguments.
  - iii) Keyword Arguments vs Default Arguments

1

7 Marks CO1

Max. Marks: 70

7 Marks

|    |    | (OR)                                                                                                                                                                                                                                                                                       |             |          |
|----|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|----------|
| 6  | a) | Elaborate on Merge Sort Recursive algorithm.                                                                                                                                                                                                                                               | CO1         | 7 Marks  |
|    | b) | Explain the fundamental operations on text files.                                                                                                                                                                                                                                          | CO4.<br>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<br>from the bottom of the screen toward the top, changing its fill color when<br>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.<br>i) Lambda Callback Handlers.                                                                                                                                                                                                      | CO5         | 14 Marks |

ii) Callable Class Object.

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Time: 3 hours

### SREE VIDYANIKETHAN ENGINEERING COLLEGE

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III B.Tech I Semester (SVEC16) Regular/Supplementary Examinations February – 2021

# PULSE AND DIGITAL CIRCUITS

### [ Electronics and Communication Engineering ]

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    | CO1 | 7 Marks |
|----|----|-------------------------------------------------------------------------|-----|---------|
|    |    | Ramp input with aid of neat sketches.                                   |     |         |
|    | b) | Apply appropriate technique on a simple RC Circuit to convert a square  | CO5 | 7 Marks |
|    |    | wave to periodical ramp signal.                                         |     |         |
|    |    | (OR)                                                                    |     |         |
| 2. | a) | Obtain the response of RC High Pass Circuit for a square wave input for | CO1 | 8 Marks |
|    |    | different Time Constants and evaluate % Tilt.                           |     |         |
|    | 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 |

| 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 $R_f$ 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 CO3 8 Marks 5ms using n-p-n silicon transistors.
  - b) With the help of neat diagrams, discuss the different methods of triggering CO1 6 Marks a binary.

(OR)

- 6. a) Sketch and explain the operation of a Fixed-bias Bi-stable Multivibrator CO1 7 Marks with relevant waveforms.
  - b) Apply appropriate multi-vibrating technique to convert voltage into CO5 7 Marks frequency using two transistors.

### UNIT-IV

- 7. a) Draw and explain the circuit diagram of transistor Miller time-base CO1 8 Marks generator.
  - b) Compare the voltage and current time base generators with some CO3 6 Marks examples.

(OR)

8. a) Explain the basic principles of Bootstrap Time-base generator.
b) Explain the principle and working of a Transistor Current Time-Base CO1 8 Marks generator.

# UNIT-V

| 9.  | a)<br>b)                                | Implement NOR gate using CMOS logic.<br>Explain the operation of TTL logic family. | CO1<br>CO1 | 7 Marks<br>7 Marks |
|-----|-----------------------------------------|------------------------------------------------------------------------------------|------------|--------------------|
|     | , i i i i i i i i i i i i i i i i i i i | (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            |
|     |                                         |                                                                                    |            |                    |

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

### DATABASE MANAGEMENT SYSTEMS

[Electrical and Electronics Engineering]

| Tim | e: 3 h   | ours                                                                                                                                | Max. M     | Marks: 70          |
|-----|----------|-------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|
|     |          | Answer One Question from each Unit<br>All questions carry equal marks                                                               |            |                    |
|     |          | UNIT-I                                                                                                                              |            |                    |
| 1   | a)<br>b) | Compare conventional file processing with traditional database system.<br>Explain about different users of database system.<br>(OR) | CO1<br>CO2 | 8 Marks<br>6 Marks |
| 2   |          | Discuss in detail about the concepts of E-R model. Draw E-R diagram for<br>Hospital Management system.                              | CO2        | 14 Marks           |
|     |          |                                                                                                                                     |            |                    |
| 3   | a)<br>b) | Describe integrity constraints used in relational database system.<br>What is a view? How views are implemented?                    | CO4<br>CO1 | 8 Marks<br>6 Marks |
| 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. (OR)                                                                       | CO1        | 6 Marks            |
| 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:<br>i) Hash based indexing.<br>ii) B-trees.<br>(OR)                                                            | CO4        | 14 Marks           |
| 10  | a)       | Explain in detail about indexed sequential access method.                                                                           | CO2        | 7 Marks            |
| -   | b)       | Explain B-tree index files.                                                                                                         | CO6        | 7 Marks            |
| 10  | a)<br>b) | Explain in detail about indexed sequential access method.<br>Explain B-tree index files.                                            | CO2<br>CO6 | 7 Marks<br>7 Marks |

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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 What is a Finite State Machine (FSM)? Give the Mathematical CO1 7 Marks a) representation of FSM. Explain each component.
  - b) Discuss the words W in the language L accepted by the automaton in the CO2 7 Marks figure.





2 What is NFA? Obtain the equivalent DFA for following finite automata a) CO2 7 Marks with  $\varepsilon$  transitions.

|   | 0    | 1  |
|---|------|----|
| а | a, b | a- |
| b | -    | с  |
| с | С    | с  |

- Construct a FA accepting all strings over {a, b} ending in aba or aaba. CO3 7 Marks b) UNIT-II
- Show that the following language is not regular  $L = \{ a^{P} | P \text{ is Prime } \}.$ 3 CO5 7 Marks a)
  - How can we say that 2 DFA's are equivalent? Explain with help of an **b**) CO1 7 Marks example.
- (OR)CO3 4 a) Construct regular expression corresponding to the finite state diagram. 7 Marks



Minimize the following finite automata. b)

CO3 7 Marks





# UNIT-III)

| 5  | a) | Explain the applications of CFG's.                                                   | CO1 | 7 Marks |
|----|----|--------------------------------------------------------------------------------------|-----|---------|
|    | b) | Find the Parse tree for the expression <b>abbcde</b> , considering the productions   | CO4 | 7 Marks |
|    |    | $S \rightarrow aACBe$ , $A \rightarrow Ab$ , $A \rightarrow b$ , $B \rightarrow d$ . |     |         |
|    |    | (OR)                                                                                 |     |         |
| 6  | a) | State and prove pumping Lemma for Context Free Languages.                            | CO5 | 7 Marks |
|    | b) | Convert the following grammar in to GNF.                                             | CO3 | 7 Marks |
|    |    | $S \rightarrow XA \mid BB$ , $B \rightarrow b \mid SB$ , $X \rightarrow b$ .         |     |         |
|    |    | UNIT-IV                                                                              |     |         |
| 7  | a) | Discuss Chomsky hierarchy of Languages.                                              | CO1 | 5 Marks |
|    | b) | Design a NPDA that accepts the language                                              | CO3 | 9 Marks |
|    | ĺ. | $L = \{ a^{n}b^{n}; n > 0 \} \cup \{ a \}.$                                          |     |         |
|    |    | (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             | CO3 | 8 Marks |
|    | ,  | to be considered are (, ), [, ], { and }.                                            |     |         |
|    |    |                                                                                      |     |         |
| 9  | a) | Construct a turning machine that computes 1's complement of a binary                 | CO4 | 7 Marks |
|    |    | number.                                                                              |     |         |
|    | 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                      | CO1 | 7 Marks |
|    |    | UTM's?                                                                               |     |         |
|    |    |                                                                                      |     |         |

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

# IRRIGATION ENGINEERING

[Civil Engineering]

Time: 3 hours

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

### UNIT-I

| 1  | a)<br>b) | Explain in detail about various factors affecting Duty.<br>Describe with neat sketches about different methods of applying water to<br>the field                                                                                                                                                                                                                         | CO1<br>CO2 | 7 Marks<br>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                                                                                                                                                                                                                                                                                                       | CO1        | 7 Marks            |
|    | -)       | advantages over conventional methods.                                                                                                                                                                                                                                                                                                                                    |            |                    |
|    |          | 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<br>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<br>width 5m and bottom width 35m and height of the dam 50m with vertical<br>u/s face. The free board is 5m. Consider Hydro static pressure due to u/s<br>water only, Uplift pressure and Earth quake forces. Consider both<br>Horizontal and vertical earthquake acceleration coefficient as 0.1. | C06        | 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.<br>(OR)                                                                                                                                                                                                                                                                                                                | CO3        | 7 Marks            |
| 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            |

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Max. Marks: 70

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

**REINFOCED CEMENT CONCRETE STRUCTURES** 

#### [Civil Engineering]

Max. Marks: 70

Time: 3 hours

### 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)<br>c) | Explain the stress block parameters with neat sketches.<br>Define partial safety factors of load and material. Write the expressions to<br>determine the design load and design strength of the material from their<br>respective characteristic values employing the corresponding partial safety                                                             | CO1<br>CO1 | 5 Marks<br>4 Marks |
|   |          | factors.                                                                                                                                                                                                                                                                                                                                                       |            |                    |
| 2 | a)       | (OR)<br>A rectangular reinforced concrete section having a breadth of 350mm is<br>reinforced with 2 bars of 28mm and two bars of 25mm diameters at an<br>effective depth of 700mm adopting M-20 grade concrete and Fe-415<br>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. <b>(OR)</b>                                                                                                                                                                                                                                                                                 | CO1        | 4 Marks            |
| 4 |          | Design an L-beam for an office room floor to suit the following data:<br>Clear span – 6m, Center to center of supports – 6.3m, The L – beam is<br>monolithic with R.C, Columns, Spacing of beams – 2.75m c/c, Loading<br>(office floor) - $4kN/m^2$ , Thickness of slab – 100mm, Width of columns<br>-300 mm, use M-20 grade of concrete and Fe-415 HYSD bars. | CO3        | 14 Marks           |
| 5 | a)       | What are the limitations for longitudinal reinforcement and transverse                                                                                                                                                                                                                                                                                         | CO1        | 5 Marks            |
|   |          | reinforcement in slabs as per IS code.                                                                                                                                                                                                                                                                                                                         | ~ ~ .      |                    |
|   | b)       | Represent IS code recommendations of torsion steel in slabs.                                                                                                                                                                                                                                                                                                   | COI        | 5 Marks            |
|   | C)       | (OR)                                                                                                                                                                                                                                                                                                                                                           | COI        | 4 Marks            |
| 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 <sup>2</sup> . 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 $450 \text{mm} \times 450 \text{mm}$ . for an axial factored load of 1600 KN. Use M-20                                                                                                                   | CO3 | 14 Marks |

concrete and Fe-415 steel. The S.B.C of soil is 200 kN/m<sup>2</sup>.



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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 If the water content of a fully saturated soil mass is 100%, what will be the CO3 a) 6 Marks relation between void ratio and specific gravity of soil? b) The water content of saturated soil and the specific gravity of soil solids CO<sub>2</sub> 8 Marks were found to be 30% and 2.70 respectively. Assuming that the unit weight of water to be 10 kN/m<sup>3</sup>, what are the saturated unit weight and void ratio? (**OR**) CO2 2 What will be the Relative density of soil, if soil is having maximum dry a) 5 Marks density of 2, minimum dry density of 1.2 and normal dry density of 1.6? CO8 Sieve analysis on a dry soil sample of mass 1000 g showed that 980 g and 9 Marks b) 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. (UNIT-II) A soil has a discharge velocity of  $3 \times 10^{-7}$  m/s and void ratio of 0.5. What 6 Marks 3 CO<sub>2</sub> a) is the seepage velocity? If flow net of a cofferdam foundation had 6 numbers of flow channels and CO<sub>2</sub> b) 8 Marks 12 numbers of equi-potential drops with a head of water lost during seepage being 6m through the foundation having  $k = 4 \times 10^{-5}$  m/minute. then what will be the seepage loss (in  $m^3/day$ ) per meter length of dam? (**OR**) Illustrate the method of determination of coefficient of permeability of CO4 4 a) 6 Marks cohesion less soils. If during a permeability test on a soil sample with a falling head CO2 8 Marks b) permeameter equal time intervals are noted for a drop of head from L<sub>1</sub> and  $L_2$  and against  $L_2$  and  $L_3$ , what will be the relation between  $L_1$ ,  $L_2$  and  $L_3$ ? (UNIT-III) What is Newmark's Chart? How is it helpful in computing the vertical 5 CO1 7 Marks a) stress at any depth due to a loaded area? Determine the vertical stress intensity at a point 3m below the ground CO2 7 Marks b) 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. (**OR**) What are the factors affecting the compaction of soils and explain them? 6 CO1 6 Marks a) A natural soil deposit has a bulk unit weight of 20kN/m<sup>3</sup> and water content CO3 8 Marks b) 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.

### UNIT-IV

- 7 a) In a consolidation test the following results have been obtained. When the CO3 6 Marks load was changed from 50kN/m<sup>2</sup> to 100kN/m<sup>2</sup>, the void ratio changed from 0.70 to 0.65. Determine the coefficient of volume decrease and the compression index.
  - b) Find the settlement due to consolidation in a  $3m \times 3m$  column foundation CO7 8 Marks 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<sub>e</sub> of the clay layer is 0.32, the recompression index C<sub>r</sub> is 0.035, the pre-consolidation pressure (P<sub>e</sub>) is  $92kN/m^2$  and the initial void ratio e<sub>0</sub> of clay is 0.80. Assume that the pressure is distributed at a 2:1 ratio and the clay is normally consolidated.

#### (**OR**)

- 8 a) What are the various assumptions and limitations of Terzaghi's one CO1 6 Marks dimensional consolidation theory?
  - b) There is a bed of compressible clay of 4m thickness with pervious sand on CO2 8 Marks 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.

- 9 a) Classify triaxial tests from the point of view of drainage characteristics. CO3 6 Marks Briefly describe the essential features of each.
  - b) Two undrained triaxial tests were conducted on soil specimens and they CO2 8 Marks gave the following results.

| Confining pressure (kg/m <sup>2</sup> ) | ) : | 150 | 300 |
|-----------------------------------------|-----|-----|-----|
| Failure load (kg/m <sup>2</sup> )       | :   | 500 | 800 |

Determine the value of apparent cohesion and friction of the soil.

(**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<sup>2</sup> and 50kN/m<sup>2</sup>. CO2 8 Marks Determine the Normal, Shear and Resultant Stress on a plane inclined at 35<sup>o</sup> to the major principal plane. Also find the maximum value of Obliquity for this plane.

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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

- a) Derive the expression for maximum bending moment and shear force for a CO1 6 Marks simply supported beam with a UDL moving from left to right.
  b) For a simply supported beam AB of 4m with an overhang of 2m, plot the CO2 8 Marks
  - 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.

#### (OR)

- a) An UDL of 50 kN/m of 6m length crosses a girder of span 40m left to CO2 6 Marks 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.
  - b) An UDL of 40kN/m and length of 3m traverse across the simply CO2 8 Marks supported length of 18m.Compute the maximum bending moment at 4m from the left support and absolute bending moment using influence lines.

# UNIT-II

3 Analyze the two–span continuous beam shown in Figure 1 by slope CO6 14 Marks deflection method and draw the bending moment and shear force diagrams.



4

Analyze the continuous beam shown in Figure 2 by using moment CO6 14 Marks distribution method and draw the bending moment diagram.



# UNIT-III

5 a) Derive the expression for strain energy due to axial load.CO17 Marksb) Determine the deflection of the free end of a cantilever of length 'L'CO27 Marks

subjected to a concentrated load 'P' at the end using strain energy method.

### (OR)

Analyze the continuous beam shown in Figure 3 by Kani's method.



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?

#### (**OR**)

8 Analyze the truss shown in Figure 4 below by Castigliano's theorem. Area CO4 14 Marks of cross section of members in mm<sup>2</sup> is shown in Figure 4. E is constant throughout.



- 9 a) Define plastic hinge and shape factor. CO1 Determine the collapse load of a continuous beam shown in Figure 5. CO3 b)
  - 7 Marks 7 Marks



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



6

CO5 14 Marks

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

# WASTE WATER TECHNOLOGY

[Civil Engineering]

Time: 3 hours

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



- 1 a) Describe the systems of sewerage.
  - b) The drainage area of one sector of a town is 20 hectares, population CO 50,000 and rate of water supply 200lpcd. The classification of the surface of this area is as follows.

| Percentage of total | Type of         | Coefficient of |
|---------------------|-----------------|----------------|
| surface area        | Surface area    | 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 Design a sewer to serve a population of 1 lakhs. The daily per capita CO3 7 Marks a) 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. Write short notes on the following. CO1 7 Marks b) i) Drop man holes. ii) Lamp holes. iii) Flushing tanks. UNIT-II 3 What is BOD? Derive an expression for the first stage BOD. CO2 7 Marks a) What do you understand by population equivalent? How do you CO<sub>2</sub> 4 Marks b) determine it? A 2% solution of a sewage sample is incubated for 5 days at 20°C. The CO<sub>2</sub> 3 Marks c) depletion of oxygen was found to be 4 p.p.m. Determine the BOD of the sewage. (**OR**) Draw and describe the conventional treatment process flow diagram of 4 CO7 7 Marks a) municipal wastewater treatment plant. Design a grit chamber for a maximum wastewater flow of 10 MLD, to CO3 7 Marks b) remove particles up to 0.2 mm diameter having specific gravity 2.65. The

kinematic viscosity of water is  $1.141 \times 10^{-6} \text{ m}^2/\text{s}$  at  $15^{\circ}\text{C}$ .

SVEC-16

CO1 7 Marks

Max. Marks: 70

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:<br>i) Population served = 50,000                                                                                                                                                                                                                                    | CO3 | 7 Marks   |
|    |    | ii) Average sewage flow = 180 lpcd                                                                                                                                                                                                                                                                                            |     |           |
|    |    | iii) BOD of raw sewage = $200 \text{ mg/l}$                                                                                                                                                                                                                                                                                   |     |           |
|    |    | iv) Raw sewage suspended solids = 300 mg/l                                                                                                                                                                                                                                                                                    |     |           |
|    |    | v) BOD removal in primary treatment = $35\%$                                                                                                                                                                                                                                                                                  |     |           |
|    |    | vi) Overall BOD reduction desired = $80\%$                                                                                                                                                                                                                                                                                    |     |           |
|    |    | (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 <sup>3</sup> /day. Also determine the efficiency of such filter unit. | CO3 | 7 Marks   |
|    |    |                                                                                                                                                                                                                                                                                                                               |     |           |
| 7  | a) | Explain anaerobic sludge digestion process and the factors influencing it                                                                                                                                                                                                                                                     | CO1 | 7 Marks   |
|    | h) | What is sludge condition and dewatering? Explain the methods of sludge                                                                                                                                                                                                                                                        | CO1 | 7 Marks   |
|    | 0) | dewatering.                                                                                                                                                                                                                                                                                                                   | 001 | / WILLING |
|    |    | (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.<br>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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#### 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

- Describe Masson's gain formulae. List out the advantages and disadvantages CO1 1 6 Marks a) of signal flow graph.
  - Determine the transfer function of the system using block diagram reduction CO4 8 Marks b) rules.



- 2 Briefly describe the effect of feedback on parameters like gain, sensitivity CO1 7 Marks a) and stability.
  - Derive the transfer function of armature controlled DC motor and draw the CO4 7 Marks b) block diagram.

# UNIT-II

- 3 Derive the expression for time response of second order under damped CO2 6 Marks a) system for unit step input and also draw the response curve.
  - The open loop transfer function of a unity feedback system is CO4 b) 8 Marks  $G(s) = \frac{10}{s(s+4)}$ . 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.

#### (**OR**)

- Sketch the complete root locus for a system with an open loop transfer 4 CO4 10 a) function  $G(s)H(s) = \frac{K}{S^2+2S+2}$ . Marks
  - Briefly explain the difficulties in Routh-Hurwitz criterion and how to CO1 b) 4 Marks overcome.

# UNIT-III)

- Derive the expressions for Resonant peak ,Resonant frequency and CO1 5 6 Marks a) Bandwidth in frequency domain analysis
  - Sketch the Nyquist plot and determine the stability of the closed loop b) CO5 8 Marks system, whose open loop transfer function is given by  $G(s)H(s) = \frac{K}{S(S^2+2S+6)}$ .

### (**OR**)

6 CO5 14 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: Marks i) Gain cross over frequency. ii) Phase cross over frequency. iii) Gain Margin and Phase Margin. iv) Stability of the system. UNIT-IV) 7 What is compensator? Explain the design procedure for a lead compensator. a) CO1 7 Marks Derive the transfer function of PI controller and also explain how it affects CO6 7 Marks b) steady state error in second order under damped system when subjected to unit ramp input. (**OR**) The open loop transfer function of a unity feedback system is 8 CO3 14  $G(s) = \frac{K}{s^2(1+0.2s)}$ . Design suitable compensator to meet the following Marks specifications. i) Acceleration error constant K<sub>a</sub>=10

ii) Phase Margin  $=30^{\circ}$ .

# UNIT-V

- 9 Differentiate the state variable approach with transfer function approach for CO2 7 Marks a) modeling of control systems. CO2 7 Marks
  - b) Obtain the state model of a given electrical system.



(**OR**)

10 a) What is state transition matrix? Give the properties of state transition matrix. CO1 7 Marks Determine the complete controllability and complete observability of the CO4 7 Marks b)

Where 
$$A = \begin{bmatrix} 0 & 1 \\ -1 & -3 \end{bmatrix}, B = \begin{bmatrix} 1 \\ 2 \end{bmatrix}, C = \begin{bmatrix} 1 & 1 \end{bmatrix}$$

system with  $\dot{Y} - \Lambda Y \perp B I I V - C Y$ 

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

# **POWER ELECTRONICS**

#### [Electrical and Electronics Engineering]

Max. Marks: 70

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

# 

| 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,<br>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,<br>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 $1-\Phi$ 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 $3-\Phi$ 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,<br>CO5 | 4 Marks  |

Time: 3 hours

# UNIT-IV

| 7 | a)<br>b) | Explain about step-down chopper and derive the output voltage equation. A step up chopper has input voltage of 220V and output voltage of 660V. If the non-conducting time of thyristor is $100\mu s$ , compute the pulse width of the output voltage | CO2<br>CO2,<br>CO4 | 7 Marks<br>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            |  |  |  |  |
|   |          |                                                                                                                                                                                                                                                       |                    |                    |  |  |  |  |
| 9 | a)       | Explain the operation of single phase half bridge inverter with aid of relevant waveforms                                                                                                                                                             | CO2,<br>CO3        | 7 Marks            |  |  |  |  |
|   | b)       | Explain the operation of basic series inverter.                                                                                                                                                                                                       | CO2,<br>CO3        | 7 Marks            |  |  |  |  |
|   |          |                                                                                                                                                                                                                                                       |                    |                    |  |  |  |  |

# (OR)

10 Explain the principle of operation of three phase inverter with 120<sup>o</sup> CO3 14 Marks conduction mode with necessary wave forms and circuit.

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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

### Answer One Ouestion from each Unit.

Max. Marks: 70

# All questions carry equal marks

# UNIT-I

- Derive the EMF equation of an alternator. Discuss the effects of pitch 1 a) CO1 6 Marks factor and distributed factor on generated voltage. A 3-phase, star connected alternator has the following data: 8 Marks b) CO4 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. (**OR**) 2 Explain the constructional details of salient pole synchronous machine CO1 7 Marks a) with a neat sketch. b) A 3-phase, 16 pole alternator has the following data: CO4 7 Marks 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. UNIT-II) 3 What is voltage regulation? Discuss the synchronous impedance method CO2 6 Marks a) of calculating the voltage regulation of alternator. b) A 30KVA, 440V, 50Hz, 3-phase, star connected synchronous generator CO4 8 Marks gave the following data: 7 Field current (A): 4 6 8 10 12 14 2 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  $0.3\Omega$ . Find regulation at full load 0.8 p.f lagging, 0.8 p.f leading by EMF method, take Z<sub>s</sub> corresponds to short circuit current of 80A. (**OR**) 4 Explain the two-reaction theory of salient pole alternator with necessary 7 Marks CO1 a) phasor diagrams. A 100KVA, 3000V, 50Hz, 3-phase, star connected alternator has CO4 7 Marks b) effective armature resistance of  $0.2\Omega$ . 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. UNIT-III 5 What is the necessity of parallel operation of alternators? Give the CO1 6 Marks a) conditions to be satisfied. What is synchronization? Explain the synchronizing of alternator using CO5 8 Marks b) three dark lamp method with a neat diagram. (**OR**) Define short circuit ratio? Briefly explain its significance in synchronous 6 CO<sub>2</sub> 7 Marks a) machine.
  - Explain the operation of synchronous generator with a constant load and CO2 7 Marks b) variable excitation.

# UNIT-IV

- 7 a) Explain the working of a synchronous induction motor with a neat CO1 7 Marks sketch.
  - b) What is damper winding? Explain the function of it and where it is CO2 7 Marks located.

### (OR)

- 8 a) What is synchronous condenser? Explain the operation of synchronous CO1 6 Marks motor as a synchronous condenser.
  - b) Calculate the R.M.S value of the induced voltage per phase of a 10-pole, CO4 8 Marks 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.

UNIT-V

- 9 a) Using double revolving field theory, explain the torque-slip CO2 7 Marks characteristics of a single phase induction motor and prove that it can not produce any starting torque.
  - b) Explain how universal motor can be operated from DC as well as AC CO2 7 Marks supplies.

#### (OR)

- 10 a) Explain the construction and operation of AC series motor. Compare the CO2 7 Marks performance with universal motor.
  - b) Describe the construction and principle of operation of a reluctance CO1 7 Marks motor.

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

# TRANSMISSION AND DISTRIBUTION

[Electrical and Electronics Engineering]

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 CO4 6 Marks of each conductor is 1.2cm. Calculate the loop inductance per km of the line.
  - b) A 3-phase double circuit line is shown below. Radius of each conductor is CO4 8 Marks 1cm. Determine the capacitance and charging current per km assuming the line is transposed and operating voltage is 220kV, 50Hz.



(**OR**)

A 33kV, 50Hz, 3-phase underground cable, 4 km long uses three single 2 a) CO4 10 Marks 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. Explain about Capacitance Grading. 4 Marks b) CO<sub>2</sub> (UNIT-II) Explain the classification of lines based on their length of transmission. 3 CO<sub>2</sub> 4 Marks a) A single-phase 50Hz generator supplies an inductive load of 5,000kw at a CO3 10 Marks b) power factor of 0.707 lagging by means of an overhead transmission line 20km long. The line resistance and inductance are  $0.0195\Omega$  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. (**OR**) Derive the expression for voltage regulation of medium transmission line 4 CO1 6 Marks a) if the line is represented by nominal- $\Pi$ . A 50Hz, 3-phase transmission line is 100km long. It has a total series CO3 8 Marks b) 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.

Time: 3 hours

# (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 $m_0=0.96$ . Dielectric strength of air = 21 1kV (rms)/cm                                                                                                           | CO4 | 7 Marks |
|----|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------|
|    | b) | An overhead line has the following data:<br>Span length 160m on level supports, conductor diameter 0.95 cm, weight<br>per unit length of the conductor 0.68kg/m, ultimate stress 4250kg/cm <sup>2</sup> ,<br>wind pressure 40kg/cm <sup>2</sup> of projected area, factor of safety 5. Find the sag<br>of the conductor                                                                                                                  | CO4 | 7 Marks |
| 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 |
| 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 $1/60\Omega$ for one meter length and 1sq.mm conductor cross section.                                                    | CO5 | 9 Marks |
|    |    | A 200 B 100 C 300 D 350 E                                                                                                                                                                                                                                                                                                                                                                                                                |     |         |
|    | b) | 25 20 25 10<br>Discuss the methods to improve the distributor voltage of an AC distributed system.                                                                                                                                                                                                                                                                                                                                       | CO2 | 5 Marks |
| 8  | a) | A DC ring main ABCDA is fed at point A from a 230V supply and the<br>loop resistances of various sections are: AB is $0.04\Omega$ ; BC is $0.35\Omega$ ; CD is<br>$0.5\Omega$ and DA is $0.05\Omega$ . The main supplies 100 A at B, 150 A at C and 200<br>A at D. Determine the voltages at each load point. If the points A and C<br>are interconnected through a link of $0.05\Omega$ , determine the voltages at the<br>load points. | CO5 | 7 Marks |
|    | b) | A single phase distributor AB has a total impedance of $(0.1+j0.2)\Omega$ . 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:                                                                                                                                                                   | CO5 | 7 Marks |
|    |    | (i) Supply end voltage $V_A$ (ii) Phase angle between $V_A$ and $V_B$                                                                                                                                                                                                                                                                                                                                                                    |     |         |
| 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. (OR)                                                                                                                                                                                                                                                                                                                                                                  | CO3 | 7 Marks |
| 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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#### 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

CO1

7 Marks

7 Marks

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

# UNIT-I

- A journal bearing with a diameter of 200mm and length 150mm carries CO2 14 Marks 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.

#### (OR)

- 2 a) Discuss about hydrodynamic and hydrostatic lubrication.
  - b) Design a journal bearing for a centrifugal pump running at 1440 r.p.m. CO3 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<sup>2</sup>/°C. Take diametral clearance as 0.1 mm.

# UNIT-II

A ball bearing subjected to a radial load of 4000 N is expected to have CO6 14 Marks 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?

### (OR)

- 4 a) The ball bearings are to be selected for an application in which the CO6 7 Marks 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.
  - b) Explain in detail about the causes and remedies of rolling contact CO1 7 Marks bearings.

# UNIT-III)

A 15 kW and 1200 r.p.m. motor drives a compressor at 300 r.p.m. CO6 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,

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**)

Design a pair of helical gears for transmitting 22kW. The speed of the CO3 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.

#### UNIT-IV

A vertical spring loaded valve is required for a compressed air 7 CO3 14 Marks

> receiver. The valve is to start opening at a pressure of 1 N/mm<sup>2</sup> gauge and must be fully open with a lift of 4mm at a pressure of 1.2 N/mm<sup>2</sup> gauge. The diameter of the port is 25mm. assume the allowable shear stress in steel as 480MPa and shear modulus as 80 kN/mm<sup>2</sup>. Design a suitable close coiled round section helical spring having squared ground ends. Also specify initial compression and free length of the spring.

#### (**OR**)

- A composite spring has two closed coil helical springs. The outer spring 8 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
  - 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/mm<sup>2</sup>.

### UNIT-V

Design a cast iron piston for a 4-stroke I.C Engine with the following CO3 14 Marks specifications:

> Cylinder bore = 100 mm, Stroke length = 120 mm, Maximum gas pressure =  $4 \text{ N/mm}^2$ , Indicated mean effective pressure=0.7 N/mm<sup>2</sup>, Mechanical efficiency = 80%, Fuel consumption=0.15 kg per BHP hour, Higher calorific value of the fuel= $42 \times 10^3 \text{ KJ/Kg}$ , Speed = 2000 r.p.m.

Assume any another relevant data required.

#### (**OR**)

14 Marks

14 Marks

CO4 14 Marks

9

5

6

An open belt connects two flat pulleys. The pulley diameters are 300mm CO5 14 Marks 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.

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

# INDUSTRIAL ENGINEERING AND MANAGEMENT

#### [Mechanical Engineering]

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<br>of 2000, 3000, 6000 and 5000 per quarter, calculate a level production<br>plan, quarterly ending inventory and average quarterly inventory. If<br>inventory carrying costs are 10 per unit, what is the annual cost of<br>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 |
|    |    | \$P \$P \$P                                                                                                                                                                                                                                                                                                                                                       |     |          |

Time: 3 hours

Time: 3 hours

# SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

# **METROLOGY AND MEASUREMENTS**

#### [Mechanical Engineering]

Max. Marks: 70

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

# UNIT-I

| 1 | a)   | Explain the following terms.                                                                                                                                                                                           | CO1 | 8 Marks |  |  |  |
|---|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------|--|--|--|
|   | ,    | i) Accuracy. ii) Precision.                                                                                                                                                                                            |     |         |  |  |  |
|   | 1 \  | iii) Calibration. iv) Reproducibility.                                                                                                                                                                                 | 001 |         |  |  |  |
|   | b)   | Describe wavelength standard with its advantages.                                                                                                                                                                      | COI | 6 Marks |  |  |  |
| 2 | ``   | $(\mathbf{OR})$                                                                                                                                                                                                        | 001 |         |  |  |  |
| 2 | a)   | fits.                                                                                                                                                                                                                  | COI | 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.<br>$i = 0.45 D^{1/3} + 0.001D$                                                   | CO3 | 8 Marks |  |  |  |
|   |      | <ul> <li>Fundamental deviation of 'g' shaft = -2.5 D <sup>0.34</sup>. State the following.</li> <li>i) Actual maximum and minimum sizes of both hole and shaft.</li> <li>ii) Maximum and minimum clearances</li> </ul> |     |         |  |  |  |
|   |      |                                                                                                                                                                                                                        |     |         |  |  |  |
| 3 | a)   | Sketch and explain the use of Limit gauges in mass production                                                                                                                                                          | CO5 | 8 Marks |  |  |  |
| 2 | 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.<br>i) Roughness.<br>ii) Waviness.<br>iii) Lay.<br>v) Sampling length<br>v) Primary texture<br>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.<br>i) Digital Thermometers.                | CO4 | 8 Marks |
|    |    | ii) Radiation method for measuring temperature.                   |     |         |
|    | b) | Discuss the calibration method for pressure measuring instrument. | CO3 | 6 Marks |

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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 CO1 6 Marks refrigeration.
  - b) The capacity of refrigerator is 150 TR when working between the CO3 8 Marks temperature limits of -10°C and 30°C. Determine the mass of ice produced per day from water at 40°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.

#### (OR)

- 2 a) Explain the working of simple evaporative air cooling system with the help CO1 6 Marks of neat sketch.
  - b) In a refrigerator working on a Bell Coleman cycle, the air drawn into the CO3 8 Marks compressor from the cold chamber at a pressure of 1 bar and 12°C. After isentropic compression to 4.5 bar, the air is cooled at constant pressure to a temperature of 20°C. The air is then expanded to 1 bar with polytropic expansion index is 1.25 and passed to the cold chamber. Determine:
    - i) Work done per kg of air flow.
    - ii) Refrigerating effect per kg of air flow.
    - iii) Theoretical COP.

# UNIT-II)

- 3 a) Explain the working of Vapour compression refrigeration system with the CO1 6 Marks help of T-s and P-h diagrams.
  - b) A vapour compression refrigeration system is operating in between the CO3 8 Marks 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:

| Pressure | Sat      | Enthalpy(kJ/kg) |        | Entropy | (kJ/kgK) |
|----------|----------|-----------------|--------|---------|----------|
| (bar)    | Temp (K) | 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 CO1 6 Marks most commonly used refrigerants.
  - b) A R-12 refrigerator working between the temperatures limits of -10°C and CO4 8 Marks 30°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°C in the expansion valve. The vapour is superheated and enters the compressor at -2°C. Work out the following:
    - (i) Show the process on T-s and p-h diagrams.
    - (ii) The amount of refrigerant circulated per minute.
    - (iii) The ton of refrigeration and the COP of the system.

# (UNIT-III)

| 5 | a) | Make a comparison between VCR a                     | and VAR systems.                                    | CO1        | 6 Marks   |
|---|----|-----------------------------------------------------|-----------------------------------------------------|------------|-----------|
|   | b) | Explain the working of Practical V                  | apour Absorption Refrigeration system               | CO3        | 8 Marks   |
|   |    | with the help of a neat sketch                      |                                                     |            |           |
|   |    |                                                     | $(\mathbf{OP})$                                     |            |           |
| 6 | 2) |                                                     |                                                     | $CO^{2}$   | Q Maulta  |
| 0 | a) | what is the basic principle of Steam                | jet reingeration system? Define:                    | COS        | 8 IVIAIKS |
|   |    | (1) Nozzle efficiency.                              |                                                     |            |           |
|   |    | ii) Entrainment efficiency.                         |                                                     |            |           |
|   |    | iii) Compression efficiency                         | as applied to Steam jet refrigeration               |            |           |
|   |    | system.                                             |                                                     |            |           |
|   | b) | What is the basic principle in The                  | ermo electric refrigeration system and              | CO3        | 6 Marks   |
|   |    | discuss it's relative advantages and disadvantages. |                                                     |            |           |
|   |    | c (                                                 |                                                     |            |           |
| _ |    |                                                     |                                                     | <b>a a</b> |           |
| 1 | a) | Define the following psychrometric                  | terms.                                              | CO5        | 6 Marks   |
|   |    | i) DBT.                                             | ii) DPT.                                            |            |           |
|   |    | iii) Absolute humidity.                             | iv) Degree of Saturation.                           |            |           |
|   |    | v) Relative humidity.                               | vi) Enthalpy of moist air.                          |            |           |
|   | b) | A sample of air has DBT and W                       | BT of 35°C and 25°C respectively as                 | CO5        | 8 Marks   |
|   |    | recorded by a sling psychrometer.                   | The barometric pressure is 1.0132 bar.              |            |           |
|   |    | Make calculations for:                              | 1                                                   |            |           |
|   |    | 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 mixt                       | ure                                                 |            |           |
|   |    | vir) the enthalpy of the mixe                       |                                                     |            |           |
| 0 | `` |                                                     | ( <b>UK</b> )                                       | 005        | 0 1 1     |
| 8 | a) | Explain the following psychrometri                  | c processes.                                        | 005        | 8 Marks   |
|   |    | 1) Sensible cooking.                                |                                                     |            |           |
|   |    | ii) Sensible heating.                               |                                                     |            |           |
|   |    | iii) Cooling and dehumidific                        | cation.                                             |            |           |
|   |    | iv) Heating and humidificati                        | on.                                                 |            |           |
|   | b) | 90m <sup>3</sup> of air per minute at 20°C and      | 75% RH is heated until its temperature              | CO5        | 6 Marks   |
|   |    | becomes 30°C. Calculate:                            | •                                                   |            |           |
|   |    | i) RH of the heated air.                            | (ii) heat added to air per minute.                  |            |           |
|   |    | ,                                                   |                                                     |            |           |
| 0 |    |                                                     |                                                     | a o c      |           |
| 9 | a) | Explain the working of summer air                   | conditioning system for hot and humid               | CO6        | 6 Marks   |
|   |    | air with the help of neat sketch and                | showing important calculation that can              |            |           |
|   |    | be made.                                            |                                                     |            |           |
|   | b) | A restaurant with a capacity of 10                  | 0 persons is to be air conditioned with             | CO6        | 8 Marks   |
|   |    | the following conditions:                           |                                                     |            |           |
|   |    | Outside conditions: 30°C DBT and                    | d 70% RH, Desires inside conditions:                |            |           |
|   |    | 23°C DBT and 55% RH, Quantity                       | of air supplied: 0.5m <sup>3</sup> /min/person. The |            |           |
|   |    | desired conditions are achieved                     | by cooling, dehumidifying and then                  |            |           |
|   |    | heating. Determine:                                 |                                                     |            |           |
|   |    | i) Capacity of the cooling of                       | coil in tonnes of refrigeration.                    |            |           |
|   |    | ii) Canacity of heating coil                        |                                                     |            |           |
|   |    | iii) Amount of water remove                         | ed by dehumidifier                                  |            |           |
|   |    | iv) By-nass factor of the hea                       | ting coil of its surface temperature is             |            |           |
|   |    |                                                     | and con or its surface temperature is               |            |           |
|   |    |                                                     |                                                     |            |           |

(OR)

10 a) Briefly discuss the factors affecting human comfort and discuss the CO6 4 Marks concept of effective temperature.

10 Marks

- b) The following data refer to summer air conditioning of a building: CO6 Outside design conditions: 43°C DBT, 27°C WBT; Inside design conditions: 25°C 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.

## <u>NOTE:</u> 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]

Max. Marks: 70 **Answer One Question from each Unit** All questions carry equal marks UNIT-I Compare the Rankine efficiency of a high pressure plant operating from 1 a) CO1 7 Marks 80 bar and 400°C with a low pressure plant operating from 40 bar and  $400^{\circ}$ C, if the condenser pressure in both the cases is 0.07 bar. Consider a steam power plant operating on the simple ideal Rankine cycle. CO1 7 Marks b) 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. (**OR**) Describe the functioning the Benson boiler with the help of a diagram. 2 a) CO1 7 Marks Explain the function of following mountings. b) CO<sub>2</sub> 7 Marks i) Fusible plug. ii) Feed check valve. iii) Safety valve. UNIT-II Define the following terms. 3 CO1 a) 7 Marks i) Factor of evaporation. ii) Chimney efficiency. iii) Boiler draught Discuss the classification of boiler draught. CO3 7 Marks b) (**OR**) A Lancashire boiler generates 2500 kg of dry steam/hr at a pressure of CO1 4 7 Marks a) 11 bae. The grate area is  $3.6m^2$  and 75 kg of coal is burnt/m<sup>2</sup> of grate are/hr. The calorific value of the coal is 33,200 kj/kg and temperature of feed wated is 17.5°C. Determine: i) Actual Evaporation/kg of coal. ii) Equivalent evaporation from and at 100°C. iii) Efficiency of the boiler Discuss briefly about preparation of heat balance sheet applied to boilers. CO4 b) 7 Marks (UNIT-III) The inlet conditions of steam to a C-D nozzle is 20bar and 260<sup>o</sup>C. The exit 5 a) CO1 7 Marks 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 32.2 cm<sup>2</sup> ii) the exit area Classify the nozzles. What is theoretical pressure ratio for dry saturated CO2 b) 7 Marks steam and super heated steam?

(**OR**)

1

Time: 3 hours

6 Steam enters the blade row of an impulse turbine with a velocity of CO1 7 Marks a) 600 m/s at angle of  $25^{\circ}$  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°. The blade friction coefficient is 10%. Determine: i) Work done per kg of steam. ii) Diagram efficiency. iii) Axial thrust per kg of steam. b) What is the classification of steam turbines? CO5 7 Marks UNIT-IV In a reaction stage of a steam turbine, the nozzle angle is  $20^{\circ}$  and the CO2 7 a) 7 Marks 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. What is degree of reaction? Discuss the working of parson's reaction CO1 b) 7 Marks turbine. (**OR**) Differentiate surface and jet condensers. 8 a) CO1 7 Marks Explain the working of a Counter flow jet condenser with neat diagram. b) CO2 7 Marks UNIT-V 9 7 Marks In a gas turbine plant working on brayton cycle, the air at inlet is 27°c, CO1 a) 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. An ideal air standard Brayton cycle operates with air. At the compressor CO2 7 Marks b) 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.

#### (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

Time: 3 hours

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

### HUMAN RESOURCE MANAGEMENT

#### [Mechanical Engineering]

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:                                                                                               | CO1 | 7 Marks   |
|    |    | i) Industrial Disputes Act.                                                                                          |     |           |
|    |    | ii) Employee Compensation Act.                                                                                       |     |           |
|    |    | 111) Indian Factories act.                                                                                           |     |           |
| 0  |    | (OR)                                                                                                                 | 001 | 1 4 3 4 1 |
| 8  |    | Define Trade Unions. Explain Trade Unions movement in India.                                                         | COI | 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]

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:                                                                                      | CO3 | 6 Marks  |
|    |    | i) Noise filter. ii) Voltage to frequency converter.                                              |     |          |
|    |    | (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 |
|    |    |                                                                                                   |     |          |

Time: 3 hours

Time: 3 hours

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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

#### **DIGITAL COMMUNICTIONS**

[Electronics and Communication Engineering]

Max. Marks: 70

7 Marks

# **Answer One Question from each Unit** All questions carry equal marks

# UNIT-I

Sketch the electrical representation of binary data 101000111 using CO1

|   |    | different formats.                                                                                                                                                                                                                  |     |          |
|---|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----------|
|   | 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:                                                                                                                                                                                                         | CO1 | 4 Marks  |
|   |    | i) Channel Capacity. ii) Rate of information.                                                                                                                                                                                       |     |          |
|   | b) | Consider five symbols given by the probabilities 1/2, 1/4, 1/8, 1/16, 1/16.<br>(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:                                                                                                                                                                                                            | CO5 | 8 Marks  |
|   |    | i) Data and Information. ii) Define entropy.                                                                                                                                                                                        |     |          |
|   | b) | Find the Channel capacity of Binary symmetric channel.                                                                                                                                                                              | CO5 | 6 Marks  |
|   |    | 1                                                                                                                                                                                                                                   |     |          |

SVEC-16

# 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 CO3 8 Marks for (n, k) cyclic code and explain its operation.

# (OR)

| 10 | a)                               | The generation matrix for a (6 | ,3) | cloc | ek c | ode | is | give | en below. C | Construct a | all CO | 3 8 Marks |
|----|----------------------------------|--------------------------------|-----|------|------|-----|----|------|-------------|-------------|--------|-----------|
|    |                                  |                                | [1  | 0    | 0    | 1   | 1  | 0    |             |             |        |           |
|    | code vectors of this code. $G =$ | 0                              | 1   | 0    | 0    | 1   | 1  |      |             |             |        |           |
|    |                                  |                                | 0   | 0    | 1    | 1   | 0  | 1    |             |             |        |           |

- 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<br>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  |
| 0 |    | Calculate the value to be leaded in to the timer registers if we want to have                                                                            | CO4 | 7 Martra |
| 9 | a) | 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.                                    | 04  | / Warks  |
|   | b) | Illustrate the serial communication in 8051 with its special function registers.                                                                         | CO2 | 7 Marks  |

(OR)

| 10 | a) | Design instructions to:                                           | CO3 | 7 Marks |
|----|----|-------------------------------------------------------------------|-----|---------|
|    |    | 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.             |     |         |
|    | b) | Draw and explain the bit for mats of IE and IP registers in 8051. | CO1 | 7 Marks |

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#### 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 CO1 7 Marks NMOS/CMOS fabrication process.
  - b) Compare the relative merits of three different forms of pull-up for an CO2 7 Marks inverter circuit. What is the best choice for realization in:

i) NMOS technology. ii) CMOS technology.

#### (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  $W/L = 4/2 \lambda$  CO1 7 Marks (i.e., 1.2/0.6µm). In this process, the gate oxide thickness is 100 °A and the mobility of electrons is  $350 \text{ cm}^2/\text{V} \cdot \text{s}$ . The threshold voltage is 0.7V. Plot *Ids* vs. *Vds* for *Vgs* = 0, 1, 2, 3, 4 and 5V.  $\epsilon_{si} = 3.9 \times 8.85 \times 10^{-14} \text{ F/cm}$ .

# UNIT-II

- 3 a) A particular layer of MOS circuit has a resistivity  $p = 1\Omega$  cm. A section CO4 7 Marks 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*?
  - b) Explain how delay estimation can be performed for a standard MOS CO3 7 Marks delay unit.

### (OR)

- 4 a) Represent the stick diagram of inverter for ratioed and ratioless logic. CO4 7 Marks Illustrate with examples.
  - b) Construct NMOS inverter layout with the help of  $\lambda$ -based rules. Clearly CO1 7 Marks mention the design rules used in the layout.

# (UNIT-III)

- 5 a) Discuss the use of pass transistor logic for functional unit design. CO5 7 Marks Identify the limitations of pass transistor logic.
  - 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. CO4 7 Marks i) Y = (ABCD)'. ii) Y = [D(A+BC)]'.

# 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 CO5 7 Marks design flow.

#### (OR)

- 8 a) Discuss in detail, different architectures of programmable interconnects CO1 7 Marks in FPGA.
  - b) Discuss any two types of programming technology used in FPGA CO1 7 Marks design.

# 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 CO6 7 Marks sequential circuits.

### (OR)

- 10 a) Discuss the use of power management techniques for low power CO3 7 Marks designs.
  - b) Discuss various approaches available in design for testability. CO1 7 Marks

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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 Describe the functional block diagram of 8086 microprocessor. 1 CO1 10 Marks a) What are the advantages of pipelining in 8086? CO1 b) 4 Marks (**OR**) 2 Describe the process of 20-bit physical address calculation in 8086. CO1 14 Marks Explain the concept with the help of an example. UNIT-II Explain the functionality of 8086 in both minimum and maximum modes 3 CO5 14 Marks with sketches. (**OR**) Explain the sequence of events that occur when 8086 encounters an CO1 4 Marks 4 a) interrupt. Explain the following Assembler Directives of 8086 Microprocessor. CO2 10 Marks **b**) i) ASSUME. ii) LABEL. iii) START. iv) GLOBAL. v) EQU. (UNIT-III) Explain the CWR of I/O modes of operation of 8255 with neat sketches. 5 a) CO1 8 Marks b) Draw and explain the Handshake mode of 8086 in detail with sketches. CO1 6 Marks (**OR**) Describe the different registers of 8289 PIC with neat sketches. 6 CO2 14 Marks UNIT-IV ) 7 Describe the internal architecture of 8257 DMA. CO2 9 Marks a) What is Cycle Stealing Mode of transfer in 8257? CO2 5 Marks b) (**OR**) 8 How is the TC Stop bit used in 8257? CO2 5 Marks a) What do you understand by Auto Load Bit (7) in 8257? CO2 5 Marks b) What is the functionality of AEN pin available in 8257? CO2 4 Marks c) UNIT-V 9 Explain the alternate functions of any two pins of port3 in an 8051 7 Marks a) CO5 microcontroller. Mention the priority order of interrupts in an 8051 microcontroller. CO3 7 Marks b) (**OR**) Explain any two bit addressable registers in 8051 microcontroller with CO3 10 a) 7 Marks formats. Explain the steps that happen when an interrupt occurs in an 8051 7 Marks b) CO5 microcontroller specifying one example.

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# 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

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

Max. Marks: 70

# UNIT-I

| 1  | a)<br>b) | Differentiate OSI reference model with the TCP/IP reference model.<br>What are the two reasons for using layered protocols? Mention its advantages and disadvantages.    | CO1<br>CO2 | 10 Marks<br>4 Marks |
|----|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------------|
| 2  | a)<br>b) | Explain in detail about Guided Transmission Media.<br>Explain the significance of switching. What are different switching techniques used in computer networks? Discuss. | CO2<br>CO6 | 7 Marks<br>7 Marks  |
|    |          | UNIT-II                                                                                                                                                                  |            |                     |
| 3  | a)<br>b) | Differentiate Fast and Giga Ethernet Technologies.<br>Calculate the efficiency of Slotted ALOHA with derivation                                                          | CO2<br>CO4 | 7 Marks<br>7 Marks  |
|    | 0)       | (OR)                                                                                                                                                                     | 001        | / 1/14/110          |
| 4  | a)<br>b) | Explain the methods used for error correction and error detection.<br>What is meant by virtual LAN's? Explain in detail about CSMA protocols.                            | CO2<br>CO2 | 10 Marks<br>4 Marks |
|    |          |                                                                                                                                                                          |            |                     |
| 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)<br>b) | Describe different design issues of Network Layer.<br>Explain the shortest path algorithm with suitable illustrations.                                                   | CO3<br>CO4 | 7 Marks<br>7 Marks  |
|    |          |                                                                                                                                                                          |            |                     |
| 7  | a)       | Briefly explain about the UDP segment header.                                                                                                                            | CO1        | 7 Marks             |
|    | b)       | Discuss Timer Management in Transport Layer.                                                                                                                             | CO2        | 7 Marks             |
| 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)<br>b) | With neat sketch, explain about the Domain Name System (DNS).<br>List and elaborate different Message Formats.                                                           | CO1<br>CO6 | 7 Marks<br>7 Marks  |
| 10 | a)       | What is meant by cookie? Mention possible attacks in Application Layer.                                                                                                  | CO2        | 7 Marks             |
| -  | b)       | Write short notes on the following:<br>i) E-mail. ii) HTTP.                                                                                                              | CO1        | 7 Marks             |
|    |          |                                                                                                                                                                          |            |                     |

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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 Ouestion from each Unit** All questions carry equal marks UNIT-I 9 Marks 1 List File and Directory maintenance commands. CO1 a) Describe Zombie processes. CO1 5 Marks b) (**OR**) 2 a) Write a shell script that counts number of lines in an input file using for CO3 7 Marks loop. Write a shell program to find whether a given number is prime or not b) CO5 7 Marks using command line arguments. UNIT-II Differentiate between PIPEs and FIFOs. CO2 7 Marks 3 a) CO6 7 Marks Write a shell script that accepts one or more filenames as arguments and b) converts all of them to uppercase, provided they exist in the current directory. (**OR**) 4 Discuss the necessity of shell programming. CO1 7 Marks a) Explain the contents of thread structures and their uses. CO1 7 Marks b) UNIT-III) 5 What is Socket? Explain Socket System calls for connectionless protocols. CO1 7 Marks a) CO1 b) Discuss Socket attributes 7 Marks (**OR**) Perform client and server program Socket programming for exchanging of 6 CO4 7 Marks a) data using system calls. Discuss about system calls and device drivers. CO1 7 Marks b) UNIT-IV ) 7 Write a C program to display Environment Variables. CO3 7 Marks a) Illustrate the working principles of parent process and child process using CO5 b) 7 Marks fork command. (**OR**) 8 Analyze shell scripts. CO<sub>2</sub> 7 Marks a) Implement the IPC form PIPE. b) CO4 7 Marks UNIT-V 9 Discuss File system structure in Linux. CO1 7 Marks a) CO2 Analyze system calls. 7 Marks b) (**OR**) 10 Write a shell program to print a multiplication table of a number given CO6 7 Marks a) from command line. Describe process scheduling. CO1 7 Marks b)

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

### **COMPUTER VISION**

[Computer Science and Engineering]

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.<br>(OR)                                                                                                                                                                           | CO2 | 5 Marks  |
| 2  | a) | Explain about color matching.                                                                                                                                                                                                                   | CO1 | 4 Marks  |
|    | b) | In the CMY space, the three primary colors are cyan, magenta and yellow.<br>CMY mixing is subtractive, recall we showed that mixing cyan and<br>magenta by over printing resulted in blue. What color is obtained by<br>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. <b>(OR)</b>                                                                                                                                                           | CO1 | 7 Marks  |
| 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  |
| 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 |
| 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. <b>(OR)</b>                                                                                                                                                            | CO2 | 5 Marks  |
| 10 |    | Analyze approximate nearest neighbors and hashing concepts with their examples.                                                                                                                                                                 | CO1 | 14 Marks |

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Time: 3 hours

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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.<br>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. (OR)                                                                                     | CO1 | 14 Marks |
| 4  | a)       | Compare analog and digital transmission.                                                                                                                      | CO2 | 4 Marks  |
|    | b)       | What is superframe and extended superframe TDM format? Explain briefly.                                                                                       | CO3 | 10 Marks |
|    |          |                                                                                                                                                               |     |          |
| 5  | a)       | What are the three modes of terrestrial propagation of Electromagnetic                                                                                        | CO1 | 7 Marks  |
|    | ,        | waves? Explain in detail.                                                                                                                                     |     |          |
|    | b)       | Draw functional block diagram of a standard telephone set and explain<br>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  |
|    | 0)       |                                                                                                                                                               | 001 | ,        |
| 7  | ``       |                                                                                                                                                               | 001 | 10 1 1   |
| /  | a)<br>b) | List various data communications character codes and explain.                                                                                                 | CO1 | 10 Marks |
|    | 0)       | (OR)                                                                                                                                                          | COS | 4 Marks  |
| 8  | a)       | With a diagram explain first generation analog cellular telephone                                                                                             | CO1 | 8 Marks  |
| Ũ  | b)       | Describe Universal Product Code (UPC).                                                                                                                        | CO1 | 6 Marks  |
|    | ,        |                                                                                                                                                               |     |          |
| 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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# III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

# **BIOMEDICAL INSTRUMENTATION**

[Electronics and Instrumentation Engineering]

|    |          | Answer One Question from each Unit.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |                    |
|----|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|
|    |          | An 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            |
| r  |          | (OR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | CO5        | 14 Mortra          |
| Ζ  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | COS        | 14 Marks           |
| n  | - )      | Continuity of the content of the con | CO1        | 7 \ (1             |
| 3  | a)<br>b) | Explain the anatomy and conducting system of heart with heat sketch.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |            | / Marks            |
|    | 0)       | (OR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | COI        | / WIAIKS           |
| 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            |
| _  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.04       | - > < 1            |
| 5  | a)       | What is respiration? Describe the mechanism of respiration.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | COI        | 7 Marks            |
|    | b)       | Discuss the 10-20 electrode placement system for EEG.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | CO4        | / Marks            |
| 6  | a)       | Illustrate the principle of working of ventilators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | CO5        | 7 Marks            |
| 0  | a)<br>b) | Write short note on EEG in diagnostics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | $CO_2$     | 7 Marks            |
|    | 0)       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 002        | / WILLING          |
| 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:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.01       | - > < 1            |
|    |          | <ol> <li>Echo Cardiography.</li> <li>Ultrasonic imaging.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | CO1<br>CO1 | 7 Marks<br>7 Marks |
|    |          | \$P & \$P                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |                    |

Max. Marks: 70

Time: 3 hours

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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)<br>b) | Describe the principle of buoyancy type density measuring instrument.<br>Explain the principle of rotating concentric cylinder viscometer with a neat diagram.     | CO1<br>CO1 | 7 Marks<br>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            |
| 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.<br>(OR)                                                                                  | CO4        | 7 Marks            |
| 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            |
| C   | b)       | Calculate the flow rate in kg/hr of saturated steam flowing in a 20cm line                                                                                         | CO1        | 7 Marks            |
|     | -)       | at a pressure of 34 kg/cm <sup>2</sup> and producing a head of 20cm of mercury across a venture neck with $\beta = 0.5$ and across an orifice with $\beta = 0.5$ . |            |                    |
| 6   | a)       | (UK)<br>What are the different types of ultresonic flow meters? Describe                                                                                           | CO5        | 7 Marka            |
| 0   | a)       | ultrasonic flow measurement system with a neat schematic diagram.                                                                                                  | 005        |                    |
|     | b)       | along with their method of detection.                                                                                                                              | 005        | / 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. (OR)                                                                                                                         | CO3        | 7 Marks            |
| 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            |
| 1.0 |          | (OR)                                                                                                                                                               | ac í       | - 1 - 1            |
| 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.<br>$\circledast  \circledast$                                                                   | CO6        | 7 Marks            |

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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<br>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    |
| 2   | a)  | Write a detailed note on block diagram of electrical communication                                                                                 | CO1   | 10 Marks   |
|     | b)  | Define modulation and explain when modulation is required.                                                                                         | CO5   | 4 Marks    |
| 3   | a)  | Explain the generation of FM waves using indirect FM method                                                                                        | CO3   | 10 Marks   |
| 5   | h)  | A 10MHz carrier is frequency modulated by a sinusoidal signal of                                                                                   | CO2   | 4 Marks    |
|     | 0)  | 500Hz, the maximum frequency deviation being 50KHz. Using the Carson's rule find the required bandwidth.                                           | 002   | i ivitains |
|     |     | (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. <b>(OR)</b>                                                                 | CO1   | 7 Marks    |
| 6   | a)  | Compare PAM, PWM and PPM.                                                                                                                          | CO5   | 7 Marks    |
|     | b)  | Explain the PAM signal recovery through holding circuit method.                                                                                    | CO3   | 7 Marks    |
| 7   | a)  | Compare the three basic forms of digital pulse modulation                                                                                          | CO5   | 10 Marks   |
| ,   | h)  | A sinusoidal signal is transmitted using PCM. The output signal to                                                                                 | CO4   | 4 Marks    |
|     | 0)  | quantizing noise ratio is required to be 55.8 dB Find the minimum                                                                                  | 001   | 11111111   |
|     |     | number of representation levels L required to achieve this performance                                                                             |       |            |
|     |     | (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, | CO4   | 4 Marks    |
|     | • • | 0.5 and 0.5. Calculate Entropy and the rate of information.                                                                                        | a a c |            |
|     | b)  | Explain how Block codes are used for error control.                                                                                                | CO6   | 10 Marks   |
| 1.0 |     | (OR)                                                                                                                                               | ac í  | - > < 1    |
| 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            |
| 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            |
| 3  | a)<br>b) | Design 4-bit adder/subtractor and explain its function.<br>What is register transfer language? Explain the basic symbols used in register transfer. | CO3<br>CO1 | 7 Marks<br>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.<br>(OR)                                                                                | CO1        | 7 Marks            |
| 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:<br>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)<br>b) | What is an Interrupt? Explain about maskable interrupts of 8085.<br>Write a program to exchange the data at 5000M and 6000M memory                  | CO1<br>CO4 | 7 Marks<br>7 Marks |
|    |          |                                                                                                                                                     |            |                    |
| 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            |
| 10 | a)       | (UK)<br>Explain in detail about instruction execution characteristics                                                                               | CO1        | 7 Marke            |
| 10 | b)       | Illustrate the various mapping techniques of Cache memory.                                                                                          | CO2        | 7 Marks            |

# 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]

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:                                                            | CO1 | 8 Marks  |
|    |    | i) Resistive temperature detectors.                                                                     |     |          |
|    |    | ii) Light dependent resistor.                                                                           |     |          |
|    | 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                              | CO3 | 8 Marks  |
|    | -) | variable differential transformers.                                                                     |     |          |
|    |    | (OR)                                                                                                    |     |          |
| 4  | a) | Analyze the principle of electromagnetic sensors.                                                       | CO2 | 6 Marks  |
|    | b) | Explain the principle of working and construction and characteristic of                                 | CO3 | 8 Marks  |
|    |    | Linear rotary differential capacitance sensor.                                                          |     |          |
|    |    | (UNIT-III)                                                                                              |     |          |
| 5  | a) | What are the properties of Piezolectric materials and mention its                                       | CO5 | 7 Marks  |
|    | )  | application?                                                                                            |     |          |
|    | b) | Explain the operation and construction of photo-voltaic cell and what are                               | CO1 | 7 Marks  |
|    | ,  | the uses.                                                                                               |     |          |
|    |    | (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  |
|    | 2) | (OR)                                                                                                    | 201 |          |
| 10 |    | Draw circuit diagram of instrumentation amplifier and explain its function.                             | CO3 | 14 Marks |
|    |    | Also derive its gain equation.                                                                          |     |          |
|    |    |                                                                                                         |     |          |

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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 GRAPHICS AND MULTIMEDIA**

### [Information Technology]

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:   | CO3   | 6 Marks |
|    |    | i) Rotation. ii) Mirror reflection.                                                         |       |         |
|    |    | (UNIT-IV)                                                                                   |       |         |
| 7  | a) | Differentiate between multimedia and hypermedia.                                            | CO5   | 8 Marks |
|    | b) | State the advantage of RIFF format.                                                         | CO1   | 6 Marks |
| 0  |    | (OR)                                                                                        | 0.04  | 0.14    |
| 8  | a) | Describe the different color spaces / models in detail.                                     | COI   | 8 Marks |
|    | b) | Explain about various Graphics and Image Data Types.                                        | 002   | 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)                                                                                        | a o c | 0.14    |
| 10 | a) | Compare lossless and lossy compression.                                                     | CO6   | 8 Marks |
|    | b) | Differentiate between directory based and arithmetic coding.                                | 005   | 6 Marks |
|    |    |                                                                                             |       |         |

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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

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

# UNIT-I

| 1 | a)<br>b)   | Explain the software development life cycle of object-oriented approach. | CO1 | 7 Marks<br>7 Marks |
|---|------------|--------------------------------------------------------------------------|-----|--------------------|
|   | 0)         | Association.                                                             | COI | / Warks            |
|   |            | (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     | CO2 | 7 Marks            |
|   |            | the steps to draw the class diagram with any one example.                |     |                    |
|   | b)         | Analyze and explain how to control the visibility of elements present in | CO2 | 7 Marks            |
|   |            | package.                                                                 |     |                    |
| 1 | 2)         | (UK)                                                                     | CO1 | 7 Mortra           |
| 4 | a)         | Explain in detail the different activities involve in the design of view | COI | / WIAIKS           |
|   |            | ayer classes with an example of report generation system that shows the  |     |                    |
|   | <b>b</b> ) | Construct and explain the class diagram for library monogement system    | cor | 7 Mortra           |
|   | D)         | Construct and explain the class diagram for horary management system.    | 002 | / Marks            |
|   |            |                                                                          |     |                    |
| 5 |            | Draw the use case model for the following system and explain.            | CO3 | 14 Marks           |
|   |            | 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.                                                  |     |                    |
|   |            | (OR)                                                                     |     |                    |
| 6 | a)         | Illustrate with an example, the relationship between sequence diagram    | CO3 | 7 Marks            |
|   | <b>.</b> . | and use cases.                                                           |     |                    |
|   | b)         | Explain what a domain model is and what function it fulfills.            | CO3 | 7 Marks            |
| _ |            |                                                                          |     |                    |

7 Discuss the following concepts of activity diagrams with suitable CO4 14 Marks examples.

| i) Transition.      | ii) Branching.  |
|---------------------|-----------------|
| iii) fork and join. | iv) swim lanes. |
|                     | (OR)            |

Max. Marks: 70

8

CO4 14 Marks

7 Marks

CO5

- Write short notes on:
  - i) Tagged values.
  - iii) Active objective.
  - v) Events and signals.

# UNIT-V

ii) Concurrent substate.

iv) Adornments.

9 a) Explain about the forward and reverse engineering.

b) Explain about the modeling executable files, libraries and tables and CO5 7 Marks files and documents.

### (**OR**)

10 Consider the application is assumed to be a web based application which CO5 14 Marks 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.

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

# WEB TECHNOLOGIES

#### [Information Technology]

Max. Marks: 70

Answer One Question from each Unit All questions carry equal marks

# UNIT-I

| 1  | a)            | Differentiate XHTML and HTML5.                                                                                                   | CO1,<br>CO2         | 7 Marks |
|----|---------------|----------------------------------------------------------------------------------------------------------------------------------|---------------------|---------|
|    | b)            | Discuss Form Elements.                                                                                                           | CO1                 | 7 Marks |
| 2  | a)            | Explain drag and drop features, offline web applications and web                                                                 | CO1,                | 7 Marks |
|    | b)            | Discuss the tags:<br>i) font. ii) pre. iii) meta. iv) video.                                                                     | CO1                 | 7 Marks |
|    |               | UNIT-II                                                                                                                          |                     |         |
| 3  | a)            | Compare the features of CSS2 with CSS3.                                                                                          | CO1,<br>CO2         | 7 Marks |
|    | b)            | What is CSS box model? Discuss with suitable example                                                                             | CO1,<br>CO2         | 7 Marks |
|    |               | (OR)                                                                                                                             |                     |         |
| 4  | a)            | What is the need of scripting? Write a script to check whether the given<br>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)                                                                                                                             | <b>a a</b>          |         |
| 6  | a)            | What are the advantages of Bootstrap?                                                                                            | CO5                 | 7 Marks |
|    | D)            | Explain responsive images in Bootstrapping.                                                                                      | 005                 | / Marks |
| 7  | a)            | Compare client side scripting and server side scripting                                                                          | CO3                 | 7 Marks |
| /  | $\frac{a}{b}$ | Write a PHP Script to find the maximum of given n numbers                                                                        | CO1                 | 7 Marks |
|    | 0)            | while a rife benefit to find the maximum of given in numbers.                                                                    | CO4                 |         |
|    |               | (OR)                                                                                                                             |                     |         |
| 8  | a)            | Discuss PHP control structures.                                                                                                  | CO1                 | 7 Marks |
|    | b)            | Write a PHP function to compute m powered n (m <sup>n</sup> ).                                                                   | CO1,                | 7 Marks |
|    |               |                                                                                                                                  | CO4                 |         |
| 0  | ``            |                                                                                                                                  | <b>a</b> a <b>a</b> |         |
| 9  | a)            | Discuss cookie and session management in PHP.                                                                                    | CO3                 | 7 Marks |
|    | D)            | Develop a PHP application which read employee information details from<br>the HTML form and store this information in a database | CO2,                | / Marks |
|    |               | $(\mathbf{OP})$                                                                                                                  | COS                 |         |
| 10 | a)            | Discuss MySOL database transactions                                                                                              | CO1.                | 7 Marks |
|    |               |                                                                                                                                  | CO6                 |         |
|    | b)            | Design a simple PHP application which uses prepare statement.                                                                    | CO1,<br>CO6         | 7 Marks |

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#### **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<br>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. <b>(OR)</b>                                                                                                              | CO2         | 6 Marks            |
| 4  | a)       | Create an interface with the methods void set() and void compute().<br>Create a class with the variables length and breadth which implements<br>this interface to find the area of rectangle. | CO3,<br>CO6 | 9 Marks            |
|    | b)       | What are the differences between abstract class and an interface?                                                                                                                             | CO3         | 5 Marks            |
| 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,<br>CO2 | 8 Marks            |
|    |          | (OR)                                                                                                                                                                                          |             |                    |
| 6  | a)<br>b) | Discuss about the life cycle of a thread with a neat diagram.<br>Describe the mechanism employed in inter thread communication in                                                             | CO1<br>CO1, | 7 Marks<br>7 Marks |
|    |          |                                                                                                                                                                                               | 002         |                    |
| 7  | 2)       | Discuss shout Linked List along with an averable                                                                                                                                              | CO2         | 6 Mortra           |
| /  | $a_{j}$  | Explain Applet Life Cycle and its methods with a post sketch                                                                                                                                  | $CO_2$      | 0 Marks            |
|    | 0)       | (OR)                                                                                                                                                                                          | 004         | o wiaiks           |
| 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<br>print the information in the same Applet when the user submits the<br>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. <b>(OR)</b>                                                                                                            | CO4         | 9 Marks            |
| 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,<br>CO6 | 5 Marks            |
|    |          |                                                                                                                                                                                               |             |                    |

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### **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

# UNTT-T

| 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<br>the design of Lexical Analyzer | CO1          | 7 Marks             |
|    | b)       | Explain input buffering strategy used in Lexical analysis phase.                                         | CO1          | 7 Marks             |
| 2  | ``       |                                                                                                          | 000          | 436 1               |
| 3  | a)<br>b) | Check whether the following grammar is LL(1) grammar or not?<br>S $\rightarrow$ iCtS                     | CO3<br>CO3   | 4 Marks<br>10 Marks |
|    |          | $S \rightarrow iCtSeS$                                                                                   |              |                     |
|    |          | $\begin{array}{c} S \rightarrow a \\ C \rightarrow b \end{array}$                                        |              |                     |
|    |          | (OR)                                                                                                     |              |                     |
| 4  | a)       | Construct the SLR parsing table for the ambiguous grammar<br>$E \rightarrow E+E   E*E   (E)   id$        | 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.<br>(OR)                                   | CO4          | 7 Marks             |
| 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)                                                                                                     | <b>G A C</b> |                     |
| 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             |
| 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                                           | CO1          | 7 Marks             |
|    | ••)      | example.                                                                                                 | 002          | 7 1 1               |
|    | D)       | write a brief note on peephole optimization.                                                             | 002          | / Marks             |
|    |          | 순화 순화 순화                                                                                                 |              |                     |

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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 Explain the architecture of UNIX operating system with a neat diagram. a) CO1 7 Marks Explain the following commands with all the options: CO1 7 Marks b) i) wc. ii) rm. iii) ls. v) mv. vii) cat. (OR) 2 Discuss various features of UNIX operating system. CO2 7 Marks a) Explain the commands used for mailing system in UNIX. CO1 7 Marks b) UNIT-II) CO2 3 Give overview of the UNIX file subsystem. 14 Marks (**OR**) 4 Implement 'cp' command in UNIX using system calls. a) CO<sub>3</sub> 7 Marks Explain 'DUP' system call and show the entries in data structures after CO4 7 Marks b) execution of DUP with a neat diagram. (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 CO3 7 Marks handling interrupts. List the entries of a region table and describe the kernel operations to CO3 7 Marks b) manipulate process address space. UNIT-IV Write an algorithm for FORK system call. 7 a) CO4 7 Marks b) Explain process termination in UNIX. CO4 7 Marks (**OR**) Explain use of Exec system with an example 'C' program. 8 CO4 7 Marks a) Write a 'C' program to change the size of process. b) CO4 7 Marks UNIT-V What are the features of Transmission Control Protocol/Internet Protocol? 9 a) CO2 7 Marks Explain. Discuss about MAC and IP addresses that can be used by TCP/IP. CO2 7 Marks b) (OR)10 a) Briefly explain Domain Name System (DNS). **CO2** 7 Marks Write short note on partitions in UNIX and explain how to create file 7 Marks CO3 b) system in UNIX.

> (A) <del>(</del> ) <u></u>

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#### 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 List and explain the advantages and disadvantages of simulation. CO1 8 Marks a) Write a short note on list processing. CO1 6 Marks b) (**OR**) 2 a) Explain queuing simulation in a spread sheet. CO2 8 Marks Illustrate simulation environments. CO6 6 Marks b) UNIT-II ) 3 A bus arrives every 20 minutes at a specific stop beginning at 6.40 A.M. CO<sub>2</sub> 7 Marks a) 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? With suitable example, explain about exponential distribution. CO4 7 Marks b) (OR)Explain Poisson Process along with its properties. 9 Marks 4 a) **CO4** Write about empirical distributions. CO4 5 Marks b) UNIT-III) 5 Explain queue behavior and queue discipline and list queuing notation for CO3 8 Marks a) parallel server systems. List the steady state parameters of M/G/1. CO4 6 Marks b) (**OR**) Name and explain some of the useful statistical models for queuing 6 a) CO6 8 Marks system. What is network of queue? Mention the general assumption for a stable CO<sub>2</sub> 6 Marks b) system with infinite calling population. UNIT-IV) 7 What are pseudo random numbers? What are the problems that occur CO<sub>4</sub> 8 Marks a) while generating pseudo random numbers? Also list the important considerations during generation of random numbers. Explain acceptance – rejection technique for Poisson distribution. b) CO3 6 Marks (**OR**) Generate 5 Poisson variates with mean  $\alpha = 0.25$ . Random numbers are: 8 7 Marks a) CO4 0.073, 0.693, 0.945, 0.739, 0.014 and 0.342. b) Explain with an example, importance of data distribution using histogram. CO6 7 Marks UNIT-V What is Time Series input model? Explain AR(1) and EAR(1) model. 9 CO4 7 Marks a) Explain verification of simulation model with a neat diagram. CO5 7 Marks b) (**OR**) What do you understand by 'Goodness of Fit Test'? Write the procedure 10 a) CO3 7 Marks for the same. Differentiate between terminating and steady state simulation with respect b) CO6 7 Marks to output analysis with an example.

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

#### DIGITAL SIGNAL PROCESSING

[Electronics and Instrumentation Engineering]

Max. Marks: 70

#### **Answer One Question from each Unit** All questions carry equal marks

# UNIT-I

- 1 Define a signal. Classify them with an example. CO4 7 Marks a) State and prove linearity, time shifting and symmetry properties of DFS. CO2 7 Marks b) (**OR**) 2 a) Define stability of a system. Explain about BIBO stability criterion of a CO<sub>2</sub> 7 Marks discrete system with an example. b) Check the following systems for time variance causality, linearity and CO4 7 Marks stability. i) y(n) = x(n) + x(n-1). ii) y(n) = n x(n). UNIT-II 3 Find the circular convolution of the sequences  $\{1,-1,1,1\}$  and  $\{1,2,3,4,5\}$ . 7 Marks CO<sub>2</sub> a) With a neat derivation explain the procedure to compute IDFT using CO1 7 Marks b) Radix - 2 FFT. (**OR**) 4 Contrast the transforms DTFT, DFS and DFT. CO1 7 Marks a) An 8 point sequence is given by x(n) {1,2,3,4,4,3,2,1}. Compute CO2 7 Marks b) 8 point DFT of x(n) by Radix - 2 DIF FFT UNIT-III) 5 CO5 7 Marks 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. Derive an expression for order of the chebyshev analog proto type filter. CO2 7 Marks b) (**OR**) Design a digital low pass Butterworth digital IIR filter which is required to 6 a) CO5 10 Marks meet the following specifications by using bilinear transformation... Pass band attenuation  $\leq 2 \text{ dB}$ , Pass band edge frequency = 4KHz. Stop band attenuation  $\geq$  40 dB, stop band edge frequency = 8KHz. Sampling rate = 24 KHz. Obtain the direct form I and II form realization for the system CO<sub>2</sub> 4 Marks b) y(n) = -0.1y(n-1)+0.2y(n-2)+3x(n)+3.6x(n-1)+0.6x(n-2)UNIT-IV) 7 Explain designing of FIR filter using frequency sampling technique. CO<sub>2</sub> 7 Marks a) Realize the following FIR system described by equation using the direct CO3 7 Marks b) form and linear phase structure.
  - $H(z) = \frac{1}{4} + \frac{1}{2}z^{-1} + \frac{3}{4}z^{-2} + \frac{1}{2}z^{-3} + \frac{1}{4}z^{-4}$

Time: 3 hours

#### (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 CO3 7 Marks range  $0.4 \pi$  to  $0.6\pi$  rad/sample by taking 7 samples of hamming window. Take N=11.

# UNIT-V

- 9 a) Discuss in detail bout pipelining of instruction execution in DSP CO1 7 Marks processors.
  - b) What is meant by bit reversal address mode? Write the applications for CO1 7 Marks which addressing are proffered.

### (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 CO1 7 Marks used to avoid over flow and underflow.

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

# **IMAGE PROCESSING**

[Information Technology]

Max. Marks: 70

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

# UNIT-I

| 1  | a)<br>b) | How is Digital Image formed? Write the digital image representation.<br>Differentiate between spatial and gray-level resolution. | CO1<br>CO2 | 7 Marks<br>7 Marks |
|----|----------|----------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|
|    |          | (OR)                                                                                                                             |            |                    |
| 2  | a)       | What is an image transform? Discuss in detail about Walsh transform<br>and Haar transform                                        | CO2        | 8 Marks            |
|    | b)       | Determine the kernel coefficients of Hadamard transforms for $N = 8$ .                                                           | CO4        | 6 Marks            |
| _  |          |                                                                                                                                  |            |                    |
| 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 Grav-level slicing and hit-plane slicing                                                                  | $CO^{2}$   | 6 Marks            |
|    | 0)       | UNIT-III                                                                                                                         | 002        | 0 IviaiKS          |
| 5  | a)       | Explain the following order-statistics filters.                                                                                  | CO2        | 8 Marks            |
|    |          | i) max and min filters. ii) median filter.                                                                                       |            |                    |
|    |          | iii) alpha-trimmed mean filter.                                                                                                  |            |                    |
|    | b)       | Explain about linear position invariant degradation                                                                              | CO1        | 6 Marks            |
|    | 0)       | (OR)                                                                                                                             | 001        | 0 10101110         |
| 6  | a)       | Derive expression for Wiener filter for image restoration using minimum                                                          | CO4        | 8 Marks            |
| U  | u)       | mean square approach                                                                                                             | 004        | 0 WIGINS           |
|    | h)       | Discuss about unconstrained constrained restorations                                                                             | CO1        | 6 Marks            |
|    | 0)       |                                                                                                                                  | 001        | 0 WILLING          |
|    |          | UNIT-IV                                                                                                                          |            |                    |
| 7  | a)       | What is the image compression system model? Draw the block diagram                                                               | CO1        | 8 Marks            |
|    |          | and explain functions of its components.                                                                                         |            |                    |
|    | 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<br>and explain about each block.                              | CO1        | 8 Marks            |
|    | b)       | Explain the symbol based coding technique for image compression.                                                                 | CO2        | 6 Marks            |
|    |          |                                                                                                                                  |            |                    |
| 0  | -)       | What is the immentance of VIO color medial? Frontain                                                                             | CO1        | ( Maulaa           |
| 9  | a)       | what is the importance of YIQ color model? Explain.                                                                              |            | 6 Marks            |
|    | b)       | Discuss the procedure for conversion from HSI to RGB color model.                                                                | COI        | 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            |

# SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

### WIRELESS NETWORKS [Information Technology]

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.                                                                                                     | COI   | 4 Marks            |
| 2  | `` |                                                                                                                                                        | 004   |                    |
| 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            |
| 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           |
|    | D) | write the procedure for registering a MS with the network.                                                                                             | 005   | 4 Marks            |
| 8  | a) | Discuss in detail about the forward traffic channels of IS-95 system                                                                                   | CO5   | 7 Marks            |
| 0  | b) | Analyze the packet transfer on uplink and downlink channels in GPRS network                                                                            | CO5   | 7 Marks<br>7 Marks |
|    |    |                                                                                                                                                        |       |                    |
| 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            |
| 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            |
|    |    | \$P \$P                                                                                                                                                |       |                    |

| CODE  | E No.: 16BT3HS02                   |                                                                                            | <b>_</b>                                                          |                  | SVEC-16   |
|-------|------------------------------------|--------------------------------------------------------------------------------------------|-------------------------------------------------------------------|------------------|-----------|
|       |                                    |                                                                                            | Roll No.                                                          |                  |           |
|       | 9                                  | SREE VIDYANIKETHAN ENGI<br>(An Autonomous Institution, Affiliated to                       | <b>NEERING COLLEGE</b><br>D JNTUA, Ananthapuramu)                 |                  |           |
|       | III B.Tech I S                     | emester (SVEC-16) Suppleme                                                                 | ntary Examinations Au                                             | igust - 2        | 021       |
|       | MANAGE<br>[Electrical and F        | RIAL ECONOMICS AND PRI<br>Clectronics Engineering, Electron<br>Electronics and Instrumenta | NCIPLES OF ACCOUN<br>nics and Communication<br>ation Engineering] | FANCY<br>Enginee | ring,     |
| Time: | 3 hours                            |                                                                                            |                                                                   | Max.             | Marks: 70 |
|       |                                    | Answer One Question fr<br>All questions carry e                                            | rom each Unit<br>qual marks                                       |                  |           |
|       |                                    | UNIT-I                                                                                     | $\supset$                                                         |                  |           |
| 1     | Define "Mana                       | agerial Economics". Explain its na<br>(OR)                                                 | ture and scope.                                                   | CO1              | 14 Marks  |
| 2     | What is dema of an enterpri        | nd forecasting? How is demand for se?                                                      | precasting key for success                                        | CO3,<br>CO4      | 14 Marks  |
|       |                                    | (UNIT-II                                                                                   | $\Box$                                                            |                  |           |
| 3     | Elucidate law                      | of diminishing marginal returns.                                                           |                                                                   | CO1              | 14 Marks  |
| 4     | Differentiate<br>i) Opj<br>ii) Sep | between:<br>portunity Costs <i>Vs</i> Outlay Costs<br>perable Costs <i>Vs</i> Joint Costs. | i.                                                                | CO1,<br>CO2      | 14 Marks  |
|       |                                    | (UNIT-II                                                                                   | <b>I</b> )                                                        |                  |           |
| 5     | Define "Mark                       | tet". Explain features of perfect ma                                                       | arkets.                                                           | CO1              | 14 Marks  |
| 6     | Distinguish b                      | etween Price Discrimination and P                                                          | roduct Differentiation.                                           | CO2              | 14 Marks  |
|       |                                    |                                                                                            | $\overline{D}$                                                    |                  |           |
| 7     | Elucidate vari                     | ous accounting concepts and conv                                                           | ventions.                                                         | CO1              | 14 Marks  |
|       |                                    | (OR)                                                                                       |                                                                   |                  |           |
| 8     | Journalize the                     | following transactions in the book                                                         | ks of Mr. Madhusudan.<br>Rs.                                      | CO2,<br>CO5,     | 14 Marks  |
|       | 01.07.2019                         | Cash brought into business                                                                 | 60,000                                                            | CO6              |           |
|       |                                    | 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

From the following balances of accounts in the books of M/s Kavitha, CO4, Prepare Trading, Profit and loss account for the year ending March 31st, CO5, 2018 and also Prepare balance sheet as on that date taking into account the following.

14 Marks

CO6

| Particulars       | Amount<br>(Rs.) | Particulars          | Amount<br>(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:

9

- 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 CO1, 14 Marks Accounting". CO2

> (P)

Roll No.

(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 predi             | ction wit          | th your o           | wn exan                   | nples.    |           |           | CO1         | 14 Marks  |
|----|-----------------------------|------------------------|--------------------|---------------------|---------------------------|-----------|-----------|-----------|-------------|-----------|
| 2  | Differentiate               | between p              | orelimina          | ary estim           | ation and                 | d detaile | d estimat | tion.     | CO2,<br>CO4 | 14 Marks  |
|    |                             |                        |                    | U                   | NIT-II                    | $\supset$ |           |           |             |           |
| 3  | Explain the c               | ontract co             | sting and          | l its sign          | ificance.                 | _         |           |           | CO1         | 14 Marks  |
|    |                             |                        |                    |                     | (OR)                      |           | _         |           |             |           |
| 4  | The followin<br>commenced i | ng was t<br>in January | he expe<br>, 2020: | nditure             | on a c                    | ontract   | for Rs.6  | 5,00,000  | CO1,<br>CO4 | 14 Marks  |
|    | Mater                       | rials                  | R                  | s.1,20,0            | 00;                       |           |           |           |             |           |
|    | Wage                        | s                      | R                  | s.1,64,40           | 00;                       |           |           |           |             |           |
|    | Plant                       | oss Charg              | A D                | s.20,000<br>s 8 600 | ,                         |           |           |           |             |           |
|    | Cash receive                | ed on a                | count 1            | 3.0,000.            | Decemb                    | er 202    | 0 amou    | nted to   |             |           |
|    | Rs.2.40.000 l               | being 80 p             | er cent o          | of work of          | certified:                | the valu  | e of mat  | erials in |             |           |
|    | hand as on 3                | 1-12-2020              | was Rs.            | 10,000.             | Prepare                   | the Cont  | ract Acc  | ount for  |             |           |
|    | 2020 showin                 | g the pro              | fit to be          | e credite           | d to the                  | year's    | Profit a  | nd Loss   |             |           |
|    | Account. Plan               | nt is to be            | deprecia           | ited at 10          | )%.                       | _         |           |           |             |           |
|    |                             |                        |                    |                     | IT-III                    | )         |           |           |             |           |
| 5  | What is bud                 | lgetary co             | ntrol?             | State th            | e main                    | objectiv  | es of bu  | udgetary  | CO1         | 14 Marks  |
|    | control, while              | e explainir            | ng the ma          | ain steps           | in budg                   | etary cor | ntrol.    |           |             |           |
| 6  | What is Cas                 | sh Budge               | t? Enu             | merate              | ( <b>OK</b> )<br>its adva | ntages a  | and desc  | cribe its | CO1         | 14 Marks  |
|    | Proparation.                |                        |                    |                     | VIT-IV                    |           |           |           |             |           |
| 7  | "Capital budg               | peting dec             | isions ar          | e irrever           | sible" Ju                 | stifv     |           |           | CO2         | 14 Marks  |
| ,  | Cupitur Cuu                 |                        | ibiolib ul         | • 1110 • 01         |                           | soury     |           |           | CO3         | 111111111 |
| 0  | ۸ (° 1                      |                        | 4 T4               |                     | (OR)                      |           |           | 41.       | 001         | 1434 1    |
| 8  | A firm has m                | the follow             | ving cash          | ants to e           | Do you                    | ist 0% p  | er annun  | 1 On this | CO3,        | 14 Marks  |
|    | Criteria?                   |                        | ing casi           | i nows.             | Do you                    | Icconni   | icita une |           | 004         |           |
|    | Year end                    | 0                      | 1                  | 2                   | 3                         | 4         | 5         | 6         |             |           |
|    | Cash inflow                 |                        |                    | 30,000              | 40,000                    | 40,000    | 40,000    | 50,000    |             |           |
|    | Cash<br>outflow             | 1,00,000               | 20,000             |                     |                           |           |           |           |             |           |
|    |                             |                        |                    |                     | NIT-V                     | )         |           |           |             |           |
| 9  | Define worki                | ng capital             | . Explair          | n its conc          | cepts.                    |           |           |           | CO1         | 14 Marks  |
| 10 | Harry Jaca (                | do or 1:4              | •1••• - ··         |                     | (OR)                      |           |           | ·····     | CO2         | 1 / \/1-  |
| 10 | How does tra                | de credit j            | play a m           | ajor role           | in deterr                 | nining w  | orking c  | apital?   | CO2,        | 14 Marks  |
|    |                             |                        |                    | 663                 | ත ත                       |           |           |           | COS         |           |
|    |                             |                        |                    | Ŵ                   | W W                       |           |           |           |             |           |

Roll No.

SVEC16 (RA)

### 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)<br>b) | Explain in detail about attenuators.<br>Describe how a Compensated Attenuator improves the unsatisfactory response of a simple Attenuator.                                       | CO1<br>CO2 | 7 Marks<br>7 Marks |
|-----|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|
| 2.  | a)       | Derive an expression for the percentage tilt of the output of a high-pass<br>RC circuit with large time constant excited by a symmetrical square<br>wave with zero average value | CO1        | 10 Marks           |
|     | b)       | How a High Pass RC circuit acts as a Differentiator?                                                                                                                             | CO2        | 4 Marks            |
| 3.  | a)       | What is synchronized clamping?                                                                                                                                                   | CO2        | 7 Marks            |
|     | b)       | State and prove clamping circuit theorem.<br>(OR)                                                                                                                                | CO1        | 7 Marks            |
| 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            |
| 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 $R_1=15k\Omega$ , $R_2=10k\Omega$ , $C_1=0.01\mu$ F and $C_2=0.015\mu$ F.<br>(OR)      | CO4        | 7 Marks            |
| 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:<br>i) loop gain $\leq 1$ .<br>ii) loop gain $> 1$ .<br>UNIT-IV                                                       | CO3        | 6 Marks            |
| 7.  | a)       | How to generate sweep voltage using Bootstrap principle?                                                                                                                         | CO3        | 7 Marks            |
|     | b)       | Explain in detail about the operation of current sweep circuit.<br>(OR)                                                                                                          | CO5        | 7 Marks            |
| 8.  | a)       | Define the terms slope error, displacement error and transmission error.<br>How are they related for an exponential sweep circuit? Define the<br>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            |
| 0   | ``       |                                                                                                                                                                                  | 0.01       | <b>5</b> ) ( 1     |
| 9.  | a)<br>b) | Explain the basic operating principle of sampling gates.<br>Implement NOR gate using CMOS logic.                                                                                 | CO1<br>CO2 | / Marks<br>7 Marks |
| 10  | -)       |                                                                                                                                                                                  | 001        | ( M. 1             |
| 10. | a)       | In a four diode sampling gate, obtain larger value of $(V_c)_{min}$ that improves linearity in addition to safety.                                                               | 006        | 6 Marks            |
|     | b)       | Implement NAND gate using CMOS logic.                                                                                                                                            | CO2        | 8 Marks            |

Roll No.

### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

# THEORY OF COMPUTATION

[Computer Science and Engineering]

Time: 3 hours

1

2

3

Answer One Question from each Unit All questions carry equal marks

UNIT-I Convert the following Moore machine into Melay machine CO1 14 Marks Next Sate Present State Output 0 1 q10 q20 0  $\rightarrow q0$ q10 q10 q21 0 q11 q10 q21 1 0 q20 q11 q20 q21 q11 q20 1 (**OR**) a) Convert the following NFA to a DFA CO1 10 Marks 1 c b 0 1 0 0 0, 1 е а O, Ì 0 0 d **b**) Differentiate NFA and DFA. CO2 4 Marks UNIT-II Construct FA equivalence to the following regular expression. 7 Marks CO3 a)  $r = 01[((10)^{*}+111)^{*}+0]^{*}1.$ Construct the regular expression accepted by following finite automaton. b) CO3 7 Marks а b b а b  $\mathbf{q}_2$ а

4 a) Construct a DFA for the regular expression 10 + (0+11) 0\*1 and optimize CO3 8 Marks the states.

(**OR**)

b) Show that the set  $\{a^{i2}\}$  is not regular. State and explain the theorem used. CO3 6 Marks

а

1

SVEC-16

Max. Marks: 70

# (UNIT-III)

| 5  |    | Construct equivalent grammar in Chomsky Normal Form for the grammar                                | CO3 | 14 Marks |
|----|----|----------------------------------------------------------------------------------------------------|-----|----------|
|    |    | $G = (\{S, A, B\}, \{a, b\}, \{S \rightarrow aAbB, A \rightarrow aA a, B \rightarrow bB b\}, S\}.$ |     |          |
|    |    | (OR)                                                                                               |     |          |
| 6  | a) | Construct parse trees, left most and right most derivations to the input                           | CO1 | 7 Marks  |
|    |    | string $w = a_*(a+b00)$ for the following grammar.                                                 |     |          |
|    |    | $E \rightarrow I   E + E   E * E   (E)$                                                            |     |          |
|    |    | $I \rightarrow a   b   Ia   Ib   I0   I1$                                                          |     |          |
|    | b) | Explain the following terms.                                                                       | CO1 | 7 Marks  |
|    | ,  | i) CFG. ii) Ambiguous grammar.                                                                     |     |          |
|    |    | iii) Sentential form. iv) Parse tree.                                                              |     |          |
|    |    | UNIT-IV                                                                                            |     |          |
| 7  | a) | Define PDA. Give an example for a language accepted by PDA by empty                                | CO1 | 10 Marks |
|    | ,  | stack.                                                                                             |     |          |
|    | 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 $\{aibjck   I, j, k \ge i=j \text{ or } i=k\}$ .      | CO3 | 6 Marks  |
|    |    | UNIT-V                                                                                             |     |          |
| 9  |    | Design a Turing Machine to recognize the language                                                  | CO4 | 14 Marks |
|    |    | $L = \{1^n 2^n 3^n   n \ge 1\}.$                                                                   |     |          |
|    |    | (OR)                                                                                               |     |          |
| 10 |    | Design a Turing Machine which can multiply two positive integers.                                  | CO1 | 14 Marks |
|    |    |                                                                                                    |     |          |
|    |    | \$P & \$P                                                                                          |     |          |

Roll No.

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### **IRRIGATION ENGINEERING**

[Civil Engineering]

Max. Marks: 70

SVEC-16

### **Answer One Ouestion from each Unit** All questions carry equal marks

# UNIT-I

- 1 What do you understand by the term irrigation? Discuss the necessity of CO1 7 Marks a) irrigation in a tropical country like India. Compute the depth and frequency of irrigation required for a certain crop CO3 b) 7 Marks
  - 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.

#### (**OR**)

- 2 List out objectives of irrigation. Discuss the advantages and ill effects of CO1 a) 7 Marks irrigation.
  - A water course has a culturable command area of 1000 hectares. The 7 Marks b) CO4 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.

# UNIT-II

- Sketch the layout of a typical diversion head works and briefly discuss the 3 a) CO<sub>2</sub> 7 Marks functions of the various components of diversion head works.
  - Define diversion head work and mention the functions of diversion head b) CO2 7 Marks work.

#### (**OR**)

4 Define silt excluder and explain the working and design considerations 7 Marks CO3 a) with a neat sketch. Explain the importance of exit gradient and how do you check the exit CO2 7 Marks b) gradient.

# UNIT-III)

Define gravity dam and discuss the components of gravity dam with a neat CO1 5 a) 7 Marks sketch. Classify dams and discuss each in detail. CO<sub>2</sub> b) 7 Marks

(**OR**)

- Briefly describe an ogee spillway and its components with a neat sketch CO2 7 Marks 6 a) and discuss its necessity. b)
  - What is an ogee spillway and how it is designed? CO3 7 Marks

# UNIT-IV)

7 What is a canal fall and why is it required to provide in a canal? 7 Marks a) CO1 b) Classify falls and explain the suitability of location of falls. CO2 7 Marks

(**OR**)

| 8  | a) | Discuss the requirements of a good outlet.                                 | CO2 | 7 Marks |
|----|----|----------------------------------------------------------------------------|-----|---------|
|    | b) | Distinguish between:                                                       | CO1 | 7 Marks |
|    |    | i) modular. ii) semi modular.                                              |     |         |
|    |    | iii) non-modular outlets with a neat sketch.                               |     |         |
|    |    | UNIT-V                                                                     |     |         |
| 9  | a) | What are the features to be considered while designing of cross drainage   | CO3 | 7 Marks |
|    |    | works?                                                                     |     |         |
|    | 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 |
|    |    |                                                                            |     |         |

\$\$ \$\$ \$\$

Roll No.

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

# **REINFORCED CEMENT CONCRETE STRUCTURES**

[Civil Engineering]

Max. Marks: 70

SVEC-16

#### 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: CO3 14 Marks Effective span = 5m, Width of the span = 250mm, Overall depth= 500mm, Service load (D.L+ L.L) = 40 KN/m<sup>2</sup>, Effective cover = 50mm Materials: use M20 concrete and Fe415 steel bars.

#### (OR)

2 Identify the depth of neutral axis and ultimate moment of resistance of T CO2 14 Marks beam section for the following data.

Flange width = 800mm, Flange thickness = 150mm, Web width = 300mm. Effective depth = 420mm. Area of tension reinforcement = 14701 mm<sup>2</sup>. Assume = M 25 grade concrete and Fe 415 grade steel.

# UNIT-II)

An RCC beam 300mm wide and 500mm deep is reinforced with 4 bars of CO3 14 Marks 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.

#### (OR)

4 Design a cantilever beam of uniform depth for a span of 2.9m, if the CO3 14 Marks 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.

### (UNIT-III)

5 A simply supported slab has a clear span of 2.1m and is supported on CO3 14 Marks walls 400mm thick along edges. If the live load on the slab 4 kN/m<sup>2</sup>, and the floor finish weighs 0.6 kN/m<sup>2</sup>. Design the slab using M20 grade concrete and Fe 415 HYSD bars.

#### (**OR**)

6 Design a simply supported RCC slab for an office floor having clear CO3 14 Marks dimensions of 4m x 10m with 230mm walls all around. Adopt M 20 grade concrete and Fe 415 grade HYSD bars.

# UNIT-IV

7 Determine the ultimate load carrying capacity of rectangular column CO3 14 Marks section 400 x 600mm reinforced with 10nos. of 25mm dia. Use M25 concrete and Fe415 steel.

#### (OR)

8 A short rectangular column having an effective length of 3m carries a CO3 14 Marks 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.

# 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 CO1 7 Marks for two columns only

# (OR)

10 Design a combined footing for the two columns at a multi-storey building. CO3 14 Marks 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<sup>2</sup>. Adopt M20 grade concrete and Fe415 grade steel. Sketch the details of reinforcements in the combined footing.

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SVEC-16

Max. Marks: 70

#### 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

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

# UNIT-I

- 1 a) Derive the relation between unit weight ( $\gamma$ ), degree of saturation (S), void CO2 6 Marks ratio (e) and unit weight of water ( $\gamma_w$ ).
  - b) The mass of a moist sample collected from the field is 645 g, and its oven CO2 8 Marks 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<sup>3</sup> of soil in the field for saturation.
    - iv) saturated density.

#### (OR)

- 2 a) Define and explain: Liquid limit; Plastic limit; Shrinkage limit; and CO4 6 Marks Plasticity index. Briefly describe the procedure to determine the liquid limit of a soil by Casagrande's method.
  - b) A soil has a liquid limit of 45%, plastic limit of 20% and flow index of CO7 8 Marks 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%.

# 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 CO2 8 Marks 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  $3 \times 10^{-3}$  cm/sec.

#### (OR)

- 4 a) Illustrate the method of determination of coefficient of permeability for CO4 6 Marks cohesive soils.
  - b) In a falling head permeability test on a soil of length L1, the head of water CO2 8 Marks 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<sup>2</sup> and stand pipe area of 130mm<sup>2</sup>. Calculate the permeability of second soil.

# (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 CO2 8 Marks 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.

- What are the field methods for compacting soils? Discuss the suitability of CO1 6 6 Marks a) different methods with respect to the soil type.
  - A proposed embankment fill requires 5000m<sup>3</sup> of compacted soil. The void CO3 b) ratio of compacted fill is specified as 0.70. Four borrow area soils are available as described in the following table.

| Borrow area | Void ratio | Cost of transportation Rs./m <sup>3</sup> |
|-------------|------------|-------------------------------------------|
| А           | 0.85       | 450                                       |
| В           | 1.20       | 300                                       |
| С           | 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)

- Describe a method to determine the pre-consolidation pressure of soil with CO8 7 7 Marks a) a neat sketch and explain its significance.
  - A layer of clay 8m thickness is located between two sand layers. The b) CO<sub>2</sub> 7 Marks coefficient of consolidation of the clay is  $5 \times 10^{-2}$  nm<sup>2</sup>/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?

#### (**OR**)

- Distinguish between normally consolidated and over consolidated soil. 8 5 Marks a) CO<sub>2</sub> 9 Marks
  - A clay soil, tested in a consolidometer showed a decrease in void ratio b) CO<sub>2</sub> from 1.20 to 1.10 when the pressure was increased from 25  $kN/m^2$  to 50 kN/m<sup>2</sup>. 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.

### UNIT-V

- Discuss the relative advantages and disadvantages of the direct shear test CO2 9 6 Marks a) over the triaxial compression test. How are triaxial tests classified based on drainage conditions?
  - b) The results for triaxial tests conducted on three samples of a soil are given CO2 8 Marks below. Obtain the shear strength parameters of the soil.

| Cell pressure (kN/m <sup>2</sup> )   | 100 | 200 | 450 |
|--------------------------------------|-----|-----|-----|
| Deviator stress (kN/m <sup>2</sup> ) | 375 | 575 | 973 |
| ()                                   | DR) |     |     |

- 10 A consolidated undrained triaxial test was conducted on saturated clay. 14 Marks CO<sub>2</sub> When the confining pressure was 200 kN/m<sup>2</sup>, the sample failed at a deviator stress of 500kN/m<sup>2</sup>. The pore water pressure was 150kN/m<sup>2</sup>. The failure plane occurred at an angle of 60° to the horizontal.
  - 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<sup>2</sup>, what would have been the deviator stress at failure? Take  $c = 44 \text{ kN/m}^2$ .

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#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

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

#### STRUCTURAL ANALYSIS-II [Civil Engineering]

Max. Marks: 70

Time: 3 hours

5

# **Answer One Ouestion from each Unit** All questions carry equal marks

# UNIT-I )

1 As system of 5 loads 80kN, 160kN, 160kN, 60kN and 40kN crosses a CO2 14 Marks 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.

### (OR)

- Write a short note on Equivalent Uniformly Distributed Load. 2 4 Marks a) CO1
  - A uniformly distributed load of 50 kN/m of 6m length crosses a girder of CO2 10 Marks b) 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.

# UNIT-II

3 Analyse the continuous beam ABCD shown in Fig.1 by slope deflection CO6 14 Marks method and draw the bending moment diagram.



Analyse the continuous beam shown in Fig.2 by moment distribution CO4 4 14 Marks method, if support B sinks by 12mm. Given that  $E = 200 \text{ kN/mm}^2$  and  $I = 20 \times 10^6 \text{ mm}^4$ .



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Fig.3

- 6 m —

CO4 14 Marks



-4 m

- 8 m-

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(**OR**)

6 Find the vertical deflection of joint B in the truss loaded as shown in 14 Marks CO2 Fig.4. The cross-sectional area of the members in mm<sup>2</sup> are shown in brackets. Take  $E = 200 \text{kN/mm}^2$ .



Find the stresses in all the members of the given frame as shown Fig.5, in 7 CO4 14 Marks which the cross sectional areas of vertical members are 3000mm<sup>2</sup> each and those of all other members are  $2200 \text{mm}^2$ . E= $2 \times 10^5 \text{ N/mm}^2$ .



8 Determine the forces in the members of the truss shown in Fig.6; AE is CO4 14 Marks constant for all the Members. The member BC is 3.6m.



- 9 Write the assumptions for evaluating fully plastic moment. And also a) CO1 8 Marks derive fully plastic moment M<sub>P</sub> and shape factor S in general.
  - A T-section consists of a flange 150x10mm and a web of 140x10mm. The b) CO3 6 Marks section modulus of the T-section is 54600mm<sup>3</sup>. 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.

#### (**OR**)

Calculate the plastic moment capacity required for the continuous beam 10 14 Marks CO3 with working loads shown in Fig.7.



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

#### WASTE WATER TECHNOLOGY [Civil Engineering]

Time: 3 hours

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 bectares. Population is 50,000. Time of entry and time | CO3      | 7 Marks  |
|   |    | 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.                                                                                                   |          |          |
|   |    | (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                                                                               | CO9      | 7 Marks  |
|   | -) | various systems of plumbing used for drainage.                                                                                                      | /        |          |
|   |    |                                                                                                                                                     |          |          |
| 3 | a) | Design a primary sedimentation tank for a proposed sewage treatment                                                                                 | CO3      | 7 Marks  |
|   |    | plant of 120 MLD capacity.                                                                                                                          |          |          |
|   | b) | Explain the Conventional treatment process of municipal wastewater                                                                                  | CO7      | 7 Marks  |
|   |    | treatment plant with flow diagram.                                                                                                                  |          |          |
| 4 | 2) | (UR)                                                                                                                                                | $CO^{2}$ | 7 Manlar |
| 4 | a) | following data                                                                                                                                      | COS      | / Marks  |
|   |    | i) Size of bars is 15 x 50mm                                                                                                                        |          |          |
|   |    | ii) Clear spacing between bars is 30mm.                                                                                                             |          |          |
|   |    | iii) Angle of inclination of screen with horizontal is 45°.                                                                                         |          |          |
|   |    | iv) Dia of incoming sewer is 0.65m.                                                                                                                 |          |          |
|   | b) | List out chemical characteristics of sewage and explain any three how                                                                               | CO8      | 7 Marks  |
|   |    | importance in maintaining the standards for disposal.                                                                                               |          |          |
|   |    | 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                                                                        | CO3      | 5 Marks  |
|   |    | per day having 5 day BOD of 160 mg/l. Assume suitable data where ever required.                                                                     |          |          |
|   |    | (UNIT-IV)                                                                                                                                           |          |          |
| 7 | a) | What is sludge conditioning and dewatering? Explain any one of the                                                                                  | CO1      | 7 Marks  |
|   | /  | methods of sludge dewatering.                                                                                                                       |          |          |
|   | b) | Sludge disposal to an onsite create lot of problems to the community.                                                                               | CO5      | 7 Marks  |
|   | -  | What are steps you suggest for the disposal and what is the mechanism                                                                               |          |          |

involved in the process of removal of pathogenic bacteria from sludge.

Max. Marks: 70

SVEC-16

#### (OR)

- 8 a) Mention the various physical chemical processes used for the removal of CO1 5 Marks nitrogen from sewage. Describe briefly each method.
  - b) Explain the process of removal of phosphorous and refractory organic CO2 9 Marks materials.

# UNIT-V

- 9 a) Classify the various methods of sewage disposal.
  - b) Draw a typical oxygen sag curve and explain its meaning and state its CO9 7 Marks importance in benefits of maintaining the DO in the river water for society.

CO1

7 Marks

#### (**OR**)

- 10 a) Discuss various methods of disposal of septic tank effluent with neat CO4 7 Marks sketches and recommendations in the design.
  - b) Design a septic tank with dispersion trench for 175 users. The rate of CO3 7 Marks water supply is 70 LPCD. Assume suitable criteria as applicable. Draw a neat sketch of the unit.

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Max. Marks: 70

### 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

# **Answer One Question from each Unit**

All questions carry equal marks

# UNIT-I

- 1 Discuss the rules implemented for the reduction of a given block diagram CO1 7 Marks a)
  - b) Compare open loop and closed loop control system performance. CO<sub>2</sub> 7 Marks

(**OR**)

- 2 State Mason's gain formula for deriving transfer function of a system. CO1 6 Marks a) 8 Marks
  - b) CO2 Determine the transfer function,  $\frac{I_2(s)}{V(s)}$  for the electrical system shown in

figure below.



- 3 a) Derive the expression for the time response of an under damped second CO2 7 Marks order system when subjected to unit step input.
  - A unity feedback system is characterized by the open-loop transfer CO4 7 Marks b) 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.

### (**OR**)

- Sketch the root locus plot for a unity feedback system with an open loop CO5 4 7 Marks a) transfer function  $G(s) = \frac{K}{s(s+2)(s+4)}$ .
  - Explain the Routh-Hurwitz criteria with an example. b) CO<sub>2</sub> 7 Marks (UNIT-III)

Sketch the Bode plot showing the gain magnitude in dB and phase angle 5 CO5 14 Marks in degrees as a function of log frequency for the transfer function 2000  $G(s)H(s) = \frac{2000}{s(s+2)(s+100)}$ . 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.

(**OR**)

Sketch the Nyquist plot and there from determine the stability of the CO5 14 Marks closed-loop system whose open-loop transfer function is given by

$$G(s)H(s) = \frac{K(s+4)}{s^2(s+1)}.$$

# UNIT-IV

- 7 a) Explain the effect of PI controller on time response characteristics of a CO6 7 Marks second order system.
  - b) Briefly explain the types of compensators in design aspects of a control CO1 7 Marks system in frequency response analysis.

#### (**OR**)

Consider the unity feedback system whose open loop transfer function is CO3 14 Marks  $G(s) = \frac{K}{1 - \frac{K}{1 -$ 

0

$$(s) = \frac{1}{S(S+1)(0.1S+1)}.$$

Design phase-lead compensator to meet the following specifications

i) Velocity error constant, 
$$K = 10 \text{ S}$$
, ii) Phase Margin = 35.

9 Obtain the state model for the electrical system shown in figure below. CO4 14 Marks Also, find the solution for the state equation with  $R=5\Omega$ , L=10mH and

C=2 $\mu$ F. Assume initial state vector  $X(0) = \begin{bmatrix} 0 \\ 1 \end{bmatrix}$ 



(OR)

- 10 a) Explain the Kalman's test for determining controllability and observability CO1 7 Marks of a system.
  - b) Explain the concept of conversion of state model in to transfer function of CO1 7 Marks a control system and vice versa.

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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]

Max. Marks: 70

SVEC-16

# 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                                                                                                                                             | CO5 | 10 Marks |
|---|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----------|
|   |    | the help of a neat sketch, explain its switching characteristics.                                                                                                                                                                                                                    |     |          |
|   | 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<br>the operation of single phase fully controlled bridge rectifier with RL<br>Load for firing angle delays $\alpha=30^{\circ}$ and $120^{\circ}$ by incorporating the<br>variation of extinction angle.       | CO2 | 10 Marks |
|   |    | (OR)                                                                                                                                                                                                                                                                                 |     |          |
| 4 | a) | List the advantages of freewheeling diode and explain how power factor<br>can be improved by connecting it in anti- parallel across the RL-Load fed<br>by a fully controlled rectifier.                                                                                              | CO1 | 6 Marks  |
|   | b) | Discuss the effect of source inductance on the performance of a three-<br>phase fully controlled rectifier with RL load and sketch relevant                                                                                                                                          | CO1 | 8 Marks  |
|   |    |                                                                                                                                                                                                                                                                                      |     |          |
| 5 | a) | Discuss the operational differences between circulating and<br>non-circulating current modes of a single phase dual converter with                                                                                                                                                   | CO1 | 7 Marks  |
|   | b) | R-load.<br>Derive the expressions for RMS values of output voltage and load current<br>of a single phase AC voltage controller (employing SCRs) feeding<br>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, | CO3 | 14 Marks |

#### 1

explain its operation.
# UNIT-IV

- 7 a) Explain the principle of complimentary commutation technique with the CO1 7 Marks help of neat circuit diagram and relevant waveforms.
  - Compare natural and forced commutation techniques and recommend CO1, 7 Marks b) suitable commutation type preferred for turning off a thyristor if used in a CO5 chopper circuit.

# (**OR**)

- Explain the working of a step-down chopper with R-load and derive an 8 a) CO1 7 Marks expression for average value of output voltage.
  - Discuss current limit control strategy for a DC chopper. CO1 7 Marks b)

# UNIT-V

Explain the operation of a basic parallel inverter and draw relevant 9 CO1, 14 Marks waveforms. CO2

### (**OR**)

- Compare sinusoidal pulse width modulation technique over multiple pulse 10 CO1 a) 8 Marks width modulation technique and discuss.
  - A single phase half bridge inverter has a resistive load of  $10\Omega$  and input 6 Marks b) CO4 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.

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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

SVEC-16

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

# UNIT-I

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 CO2 8 Marks alternator? What steps are taken to eliminate third and fifth harmonic components of generated emf?

### (OR)

- 2 Explain the following characteristics of an alternator: CO1 14 Marks
  - i) Open Circuit Characteristics.
  - ii) Short Circuit Characteristics.
  - iii) Zero Power Factor Characteristics.

# UNIT-II

- 3 a) Explain the two reaction theory of salient pole machine. Draw the phasor CO1 8 Marks diagram and obtain regulation of an alternator using this theory.
  - b) A 70 MVA, 13.8 kV, 3-phase star connected salient pole alternator having CO4 6 Marks  $X_d = 1.83\Omega$  and  $X_q = 1.2\Omega$  delivers at 0.8 p.f lagging. Neglecting the armature resistance, calculate:
    - i) The excitation voltage  $(E_f)$ .
    - ii) The voltage regulation.

### (OR)

- 4 a) Describe the slip test method for measurement of  $X_d$  and  $X_q$  of CO1 6 Marks synchronous machine.
  - b) An alternator has a direct-axis synchronous reactance of 0.8 per unit and CO4 8 Marks 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.

# UNIT-III)

- 5 a) Discuss the load sharing between two alternators which are connected in CO1 6 Marks parallel.
  - b) A shopping complex consists of a lighting load of 3000 kW and a motor CO3 8 Marks 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.

### (**OR**)

- 6 a) Obtain an expression fort the natural frequency of undamped oscillation of CO1 6 Marks the rotor of synchronous motor.
  - b) Show that the short circuit ratio of a synchronous generator is the CO2 8 Marks reciprocal of per-unit value of synchronous reactance adjusted to saturation at rated voltage.

# UNIT-IV

- 7 a) Derive an expression for power developed in a 3-phase synchronous CO2 8 Marks motor.
  - b) A 20kW, 400V, 3-phase, star-connected synchronous motor has per phase CO4 6 Marks 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.

### (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 CO4 8 Marks 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.

# UNIT-V

- 9 a) Explain why a single-phase single winding induction motor produces no CO1 6 Marks starting torque.
  - b) What design features are incorporated in a split-phase motor to make it CO3 8 Marks self-starting?

### (OR)

CO1 14 Marks

- 10 Write a short notes on:
  - i) Resistance split-phase motors.
  - ii) Capacitor split phase motors.
  - iii) Capacitor start and run split phase motors.

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Time: 3 hours

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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]

Max. Marks: 70

SVEC-16

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

# UNIT-I

- a) Derive the expression for flux linkages due to internal flux and external CO2 6 Marks flux for a single wire current carrying conductor.
   b) Derive an expression for the indextance of a 2 marks and external CO2 8 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 CO6 7 Marks insulation of cables. And explain the inter-sheath grading of cables.
  - b) A single core 11kV, 50Hz, 5km long cable has a core diameter of 1.5cm CO4 7 Marks 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.

# UNIT-II

- 3 a) Discuss the classification of overhead transmission lines. Define A, B, C CO3 7 Marks and D constants of a transmission line.
  - b) Derive the reflection and refraction coefficients of a line terminated with CO2 7 Marks resistance.

### (OR)

- 4 a) Define regulation of a short 3-phase transmission system and develop an CO1 7 Marks expression for approximate voltage regulation.
  - b) A balanced 3-phase load of 30MW is supplied at 132kV, 50Hz and CO4 7 Marks 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  $315 \times 10^{-6}$  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.

# (UNIT-III)

- 5 a) A transmission line has a span of 275m between level supports. The CO4 7 Marks 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<sup>2</sup> of projected area, calculate sag for a safety factor of 2. Weight of 1 c.c. of ice is 0.91 gm.
  - b) A 3-phase, 220kV, 50Hz transmission line consists of 1.5 cm radius CO3 7 Marks conductor spaced 2 metres apart in equilateral triangular formation. If the temperature is 40°C and atmospheric pressure is 76cm, calculate the corona loss per km of the line. Take mo = 0.85.

### (OR)

- Each line of a 3-phase system is suspended by a string of 3 identical CO2 6 a) 10 Marks 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
  - Explain briefly various line supports used for overhead transmission CO1 4 Marks b) system.

# UNIT-IV)

- 7 a) Explain load modeling and its characteristics.
  - A two-wire DC distributor cable 1000metres long is loaded with CO4 7 Marks b) 0.5 A/metre. Resistance of each conductor is 0.05  $\Omega$ /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?

#### (**OR**)

- 8 Explain various factors that influence voltage levels in design and CO3 7 Marks a) operation of the distribution system.
  - Discuss the difference between radial and loop types of primary b) CO5 7 Marks distribution feeders.

### UNIT-V

- 9 a) How do you analyze a substation service area with 'n' primary feeders? CO2 8 Marks
  - List the procedure to select the location of substation. CO7 b) 6 Marks

#### (OR)

- 10 a) Give the comparison of outdoor and indoor sub-stations. CO5 7 Marks
  - What are the advantages of GIS over conventional air substations? Give CO6 7 Marks b) the limitations of GIS.

(A) (P) (f) CO1

7 Marks

Time: 3 hours

7

Roll No.

### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### **DESIGN OF MACHINE ELEMENTS-II** [Mechanical Engineering]

Max. Marks: 70

SVEC-16

### **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 CO3 14 Marks 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  $60^{\circ}C = 0.014 \text{ kg/m-s}$ .

#### (**OR**)

- 2 A 70mm long journal bearing supports a load of 2700N on a 40mm CO<sub>2</sub> 14 Marks 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.
  - UNIT-II
- 3 The ball bearings are to be selected for an application in which the radial CO4 14 Marks 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.

### (**OR**)

4 A ball bearing subjected to a radial load of 5 kN is expected to have a life CO4 14 Marks 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%.

### (UNIT-III)

- 5 Explain briefly about Lewis equation for tangential tooth load (capacity) CO1 7 Marks a) for both spur and helical gears.
  - b) Explain about double helical and herring bone gears with neat sketch. CO1 7 Marks (**OR**)
- Design a pair of spur gears to transmit 25kW at 1200 r.p.m to a parallel 6 CO3 14 Marks shaft to be rotated at 600 r.p.m. The center distance between shafts is 175mm.

# UNIT-IV

Write the classification of springs CO1 a) Design a helical compression spring to sustain an axial load of 3kN. The CO3 b) deflection is 60mm. spring index is '6'. The shear stress is not to exceed 300MPa. Rigidity modulus for spring material is 81GPa.

#### (**OR**)

8 Design a helical spring to support a tensile load of 6 kN and to have a 14 Marks CO3 stiffness of 100N/mm. the spring index is 6. The spring is made of steel having allowable stress of 300MPa. Take G=80GPa.

1

4 Marks

10 Marks

# UNIT-V

9

An open-belt drive connects two pulleys 120cm and 50cm diameters, on CO6 14 Marks 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.

### (OR)

10 Design a cast iron piston for a single acting four stroke engine for the CO5 14 Marks following data:

Cylinder bore = 100 mm; Stroke = 125 mm; Maximum gas pressure = 5 N/mm<sup>2</sup>; Indicated mean effective pressure =  $0.75 \text{ N/mm}^2$ ; Mechanical efficiency = 80%; Fuel consumption = 0.15 kgper brake power per hour;Higher calorific value of fuel =  $42 \times 103 \text{ kJ/kg}$ ; Speed = 2000 r.p.m.

Any other data required for the design may be assumed.

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### SREE VIDYANIKETHAN ENGINEERING COLLEGE

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(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

### INDUSTRIAL ENGINEERING AND MANAGEMENT

#### [Mechanical Engineering]

| Time: 3 hours Answer One Question from each Unit |          |                                                                                                                                                                                                                                     | Max. Marks: 70                                                                                                                                                                                                   |                    |          |  |  |
|--------------------------------------------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------|--|--|
|                                                  |          | All question                                                                                                                                                                                                                        | s carry equal marks                                                                                                                                                                                              |                    |          |  |  |
|                                                  |          |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                  |                    |          |  |  |
| 1                                                |          | Explain the contributions of F.W. Tay                                                                                                                                                                                               | lor's to management.                                                                                                                                                                                             | CO1                | 14 Marks |  |  |
| 2                                                |          | What is SWOT analysis? Illustrate it v                                                                                                                                                                                              | with business example.                                                                                                                                                                                           | CO2                | 14 Marks |  |  |
| 3                                                |          | Discuss in detail various factors affect                                                                                                                                                                                            | ting plant location.                                                                                                                                                                                             | CO2                | 14 Marks |  |  |
| 4                                                | a)<br>b) | Discuss bath tub curve in conjunction<br>Discuss the following hazard models<br>i) Constant hazard model.<br>ii) Linearly increasing model.                                                                                         | CO2<br>CO1                                                                                                                                                                                                       | 7 Marks<br>7 Marks |          |  |  |
| 5                                                |          | Define Work study. List and explain t                                                                                                                                                                                               | he steps involved in method study.                                                                                                                                                                               | CO1                | 14 Marks |  |  |
| 6                                                |          | Explain in detail the work sampling pr                                                                                                                                                                                              | CO1                                                                                                                                                                                                              | 14 Marks           |          |  |  |
| 7                                                |          | The demand for an item in a compa-<br>company can produce the item at a r<br>one setup is Rs.500 and the holding c<br>The cost of shortage is Rs 20 p<br>manufacturing quantity and the numb<br>manufacturing time and time between | ny is 18000 units per year, and the<br>rate of 3000 per month. The cost of<br>ost of one unit is Rs.0.15 per month.<br>ber year. Determine the optimum<br>ber of shortages. Also determine the<br>setups<br>(OR) | CO3                | 14 Marks |  |  |
| 8                                                |          | Find the optimal quantity for a prod<br>product is 500 units. The cost of stor<br>unit cost and the ordering cost per<br>given below.                                                                                               | Suct where the annual demand for a rage per unit per year is 10% of the order is Rs.180. The unit costs are                                                                                                      | CO4                | 14 Marks |  |  |
|                                                  |          | Quantity                                                                                                                                                                                                                            | Purchasing Cost                                                                                                                                                                                                  |                    |          |  |  |
|                                                  |          | $0 \le Q1 \le 500$                                                                                                                                                                                                                  | Rs.25 per unit                                                                                                                                                                                                   |                    |          |  |  |
|                                                  |          | $500 \le Q2 \le 1500$                                                                                                                                                                                                               | Ks.24.80 per unit                                                                                                                                                                                                |                    |          |  |  |
|                                                  |          | $\frac{1500 \le Q3 \le 3000}{3000 < 04}$                                                                                                                                                                                            | $\frac{\text{KS.24.00 per unit}}{\text{Rs. 24.40}}$                                                                                                                                                              |                    |          |  |  |
|                                                  |          |                                                                                                                                                                                                                                     | UNIT-V                                                                                                                                                                                                           |                    |          |  |  |

9 What is the significance of control chart in industry? List the basic steps CO5 14 Marks involved for drawing variable control charts.

#### (**OR**)

- Define TQM. Illustrate with examples the significance of TQM in CO1 10 a) 7 Marks organizational growth.
  - Discuss the significance of duties of plant safety inspector in the CO6 b) 7 Marks industries.

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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

# **Answer One Ouestion from each Unit** All questions carry equal marks

# UNIT-I

- 1 Define error. Explain types of errors in measuring system. a)
  - A slip gauge set with 87 pieces, as under is available. b)

| 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 With neat sketches, differentiate between hole basis system and shaft basis CO1 7 Marks a) system.
  - Determine the dimensions and tolerances of shaft and hole having size of CO3 7 Marks b) 30H<sub>7</sub>h<sub>8</sub> fit. Also, determine the allowance and maximum clearance.

# 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 | CO5 | 7 Marks |
|   |    | method of magnification adopted to it.                                    |     |         |

### (**OR**)

| 4 | a) | Why is sine bar not suitable for measuring angles above 45°? | CO2 | 6 Marks |
|---|----|--------------------------------------------------------------|-----|---------|
|   | b) | Explicate the working principle of                           | CO1 | 8 Marks |

- Explicate the working principle of: b)
  - i) Optical comparator.
  - ii) Pneumatic comparator.

# UNIT-III)

| 5 | a) | Illustrate with suitable sketches the measurement of straightness using                 | CO1 | 8 Marks |
|---|----|-----------------------------------------------------------------------------------------|-----|---------|
|   |    | autocollimator.                                                                         |     |         |
|   | 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 |

Mention various BIS symbols for indication of surface finish. CO1 6 Marks b)

# (UNIT-IV)

7 Name the important elements of thread which are required to be measured CO1 14 Marks 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.

### (**OR**)

Demonstrate the method used for checking pitch of the gear. 8 a) CO5 6 Marks Describe a gear tooth vernier caliper and show how this is used for CO4 8 Marks b) checking gears.

Max. Marks: 70

CO1 6 Marks

CO2 8 Marks

# UNIT-V

| 9  | a) | Explain the following:                                          | CO1 | 8 Marks |
|----|----|-----------------------------------------------------------------|-----|---------|
|    |    | i) Electrical strain gauge.                                     |     |         |
|    |    | ii) Stain gauge rosettes.                                       |     |         |
|    | b) | Differentiate between compressive strains and tensile strains.  | CO1 | 6 Marks |
|    |    | (OR)                                                            |     |         |
| 10 | a) | Write short notes on Electrical resistance sensors and Junction | CO1 | 7 Marks |
|    |    | semiconductor sensors.                                          |     |         |
|    | b) | Explain the method used for pressure measurement.               | CO5 | 7 Marks |
|    |    |                                                                 |     |         |
|    |    | ÷ li                        |     |         |

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### **SREE VIDYANIKETHAN ENGINEERING COLLEGE**

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(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

### **REFRIGERATION AND AIR CONDITIONING**

[Mechanical Engineering]

| Time: 3 hours                                                                                                                                              | Max. Marks: 70                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| Answer One Question from each Unit                                                                                                                         |                                |
| All questions carry equal marks                                                                                                                            |                                |
|                                                                                                                                                            |                                |
| 1 a) The COP of an air refrigeration cycle is very low, but still a refrig                                                                                 | eration CO1 6 Marks            |
| system is most common in the Air craft, discuss the statement.                                                                                             |                                |
| b) A Bell-Coleman refrigeration cycle works between 1 bar and 6 b                                                                                          | ar. The CO3 8 Marks            |
| adiabatic efficiency of compression is 90% and expansion is 95%                                                                                            | 6. Find                        |
| the COP of the system and its tonnage when the air flow rate is 2<br>The ambient temperature is $25^{\circ}$ C and refrigerator temperature is $5^{\circ}$ | kg/sec.                        |
| (OR)                                                                                                                                                       | С.                             |
| 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                                                                                       | <sup>o</sup> C and CO2 8 Marks |
| 26° C. Determine the mass of ice produced per day from water a                                                                                             | t 26°C.                        |
| Also find the power required to drive the unit. Assume that the                                                                                            | e cycle                        |
| operates on reversed carnot cycle and latent heat of ice is 335 kJ/kg                                                                                      |                                |
| (UNIT-II)                                                                                                                                                  |                                |
| 3 a) How does the increase in condenser temperature affect COP? Also                                                                                       | explain CO1 6 Marks            |
| the influence of evaporator temperature on COP. which of t                                                                                                 | ne two                         |
| b) A vapour compression machine is used to maintain a temperature                                                                                          | of -23° CO4 8 Marks            |
| C in a refrigerated space. The ambient temperature is $37^{\circ}$                                                                                         | C. The                         |
| compressor takes in dry saturated vapour of F-12. A minimum                                                                                                | n 10⁰C                         |
| temperature difference is required at the evaporator as wel                                                                                                | as at                          |
| condenser. There is no sub cooling of the liquid. If the refrigera                                                                                         | nt flow                        |
| rate is 1 kg/min, find:                                                                                                                                    |                                |
| 1) I onnage of refrigeration.                                                                                                                              |                                |
| iii) Ratio of COP of this cycle to COP of carnot cycle                                                                                                     |                                |
| (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 CO4 10 Marks           |
| 960 r.p.m. The compressor clearance factor is 0.03 and the                                                                                                 | law of                         |
| compression $PV^{m}=C$ the operating pressures for the vapour comp                                                                                         | ression                        |
| refrigeration system are: 8.47 bar (35°C) and 1.004 bar (-30°C) are refrigerent temperatures are entering the compression $20^{\circ}$ C law               | c). The                        |
| compressor $50^{\circ}$ C entering the condenser $45^{\circ}$ C leaving the co                                                                             | ndenser                        |
| $25^{\circ}$ C, entering the expansion value $30^{\circ}$ C and leaving the evapor                                                                         | tor dry                        |
| saturated. Assuming that heat removed in the compressor is 25                                                                                              | kJ/sec.                        |
| calculate:                                                                                                                                                 |                                |
| i) The refrigerating capacity.                                                                                                                             |                                |
| ii) The compressor power.                                                                                                                                  |                                |
| 111) C.O.P.                                                                                                                                                | rico in                        |
| iv) iviass of condensing cooling water assuming the                                                                                                        |                                |

v) Also tabulate energy balance for 1 kg of refrigerant.

# UNIT-III

- 5 a) Discuss the advantages of vapour absorption refrigeration system over CO1 7 Marks vapour compression refrigeration system.
  - b) In a vapour absorption refrigeration system, heating, cooling and CO3 7 Marks refrigeration takes place at the temperatures of 100°C, 20°C and -5°C respectively. Find the maximum C.O.P of the system.

### (**OR**)

- 6 a) What is thermo electric refrigeration system? List out the merits and CO2 6 Marks demerits of thermo-electric refrigeration system over other refrigeration system. What are the fields of its applications?
  - b) Determine the COP of a vapour absorption refrigeration system when the CO2 8 Marks temperature of generator is 120°C, the temperature of the condenser is 30°C and the temperature of the evaporator is -20°C. What would be its C.O.P, if it were a Carnot?

# 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°C, 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 10°C 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.

### (OR)

- 8 a) Explain in brief, an adiabatic saturation process. Represent the same on a CO5 6 Marks psychrometric chart.
  - b) Ten grams of moisture per kg of dry air is removed from atmospheric air CO6 8 Marks when it is passed through an air conditioning system and its temperature becomes 20°C. The atmospheric conditions are 40°C 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.

# 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 CO1 7 Marks diagram.

# (OR)

- 10 a) Define human comfort and explain the factors which affect human CO1 7 Marks comfort.
  - 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

2

6

Max. Marks: 70

# **Answer One Question from each Unit** All questions carry equal marks

# UNIT-I

- Differentiate between water tube and fire tube boilers. 1 CO1 7 Marks a)
  - Discuss the working of Babcock and Wilcox boiler with a neat sketch. CO1 7 Marks b) (**OR**)

#### Describe Locomotive boiler with a neat sketch. CO1 7 Marks a) In a Rankine cycle the steam at inlet to the turbine is saturated at a CO2 b) 7 Marks 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.

# UNIT-II

- 3 Write a short note on equivalent evaporation, factor of evaporation and CO1 7 Marks a) boiler efficiency.
  - A Lancashire boiler generates 2500 kg of dry steam / hr at a pressure of CO3 7 Marks b) 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°C. Determine:
    - i) Actual evaporation / kg of coal.
    - ii) Equivalent evaporation from and at 100°C.
    - iii) Efficiency of the boiler.

### (**OR**)

4 Explain induced draught and forced draught. CO1 7 Marks a) How much air used per kg of coal burnt in a boiler having chimney of CO4 7 Marks b) 32.3m height to create a draught of 19mm of water column when the temperature of flue gases in the chimney is 370°C and the temperature of boiler house is 30°C?

# UNIT-III)

- 5 Explain the types of steam nozzles. a)
  - Dry saturated steam at a pressure of 5 bar enters in a nozzle and is CO2 9 Marks b) 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.

### (**OR**)

- Give the classification of steam turbines. a) The velocity of steam leaving the nozzles of impulse turbine is 1200 m/s CO5 9 Marks b) 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.

CO1 5 Marks

CO1

5 Marks

# UNIT-IV

- 7 What are various sources of air leakage in to steam condenser? How does CO2 7 Marks a) it affect the performance of condensing plant? Describe with neat sketch the working of surface condenser. CO1 7 Marks b) (OR)8 What is 50% Reaction Turbine? What are the characteristics of 50% CO1 5 Marks a) **Reaction Turbine?** Reaction Turbine runs at 3000 r.p.m and its steam consumption is 9 Marks b) CO<sub>2</sub> 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. UNIT-V 9 Distinguish between rocket propulsion and turbojet propulsion Engines. CO1 7 Marks a) b) The air enters the compressor of an open cycle constant pressure gas CO<sub>2</sub> 7 Marks turbine at a pressure of 1 bar and temperature of 20°C. 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<sub>P</sub>=1 kJ/kgK,  $\gamma$  =1.41 and Calorific Value fuel = 41800kJ/Kg. (**OR**) 10 In a constant pressure open cycle gas turbine air enters at 1 bar and 20°C CO2 7 Marks a) and leaves the compressor at 5 bar. Using the following data: temperature of the gases entering the turbine =  $680^{\circ}$ C, pressure loss in the combustion chamber = 0.1 bar,  $\eta_{compressor} = 85\%$ ,  $\eta_{turbine} = 80\%$ ,  $\eta_{combustion} = 85\%$ ,  $\gamma$ =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.
  - b) Explain the effect of regeneration, inter cooling, and reheating on the CO2 7 Marks performance of Gas turbine plant.

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### **SREE VIDYANIKETHAN ENGINEERING COLLEGE**

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#### 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 CO1 14 Marks closed loop control systems. (**OR**) Define Mechatronics. Mention the key elements of Mechatronic systems. 2 CO1 a) 6 Marks Mention the advantages and disadvantages involved in a mechatronic CO1 8 Marks b) systems. UNIT-II ) 3 Explain the static characteristics of a sensor. CO1 6 Marks a) 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. Explain the working principle and operation of an optical encoder. b) CO2 8 Marks (**OR**) State the factors to be considered for selecting a sensor. 4 a) CO<sub>2</sub> 4 Marks What is a pneumatic system? Explain the elements of a pneumatic system. b) CO2 10 Marks (UNIT-III) What is noise in signals? Explain low pass and band pass filtering circuit. CO3 8 Marks 5 a) Explain voltage frequency converters with their use in signal conditioning. CO1 6 Marks b) (**OR**) Why is operation amplifiers used in signal conditioning? Explain 6 CO3 8 Marks a) differential amplifier with neat sketch. Derive an expression for finding the unknown resistance in Wheat stone b) CO3 6 Marks bridge circuit. UNIT-IV 7 Describe and compare the characteristics of Proportional (P) control and CO4 14 Marks Proportional plus integrated (PI) control. (OR)8 Explain PID controller tuning using process reaction curve method. CO<sub>4</sub> 8 Marks a) A PI controller has an input voltage range of 0.4 - 2 V and the output 6 Marks b) CO4 voltage range 0.10 V,  $R_2$ = 160 k $\Omega$ ,  $R_1$ =8 k $\Omega$  and C= 10  $\mu$ F. Determine the values of gain  $K_p$ ,  $K_i$  and proportional band of integration gain in %/(% s). UNIT-V 9 Explain the mechatronics design approach. CO5 8 Marks a) Elaborate the method of automatic car parking system. b) CO5 6 Marks (**OR**) 10 Describe the mechatronics application in an automobile engine a) CO5 10 Marks management system. Justify the importance of ethics as a design constraint. CO6 4 Marks b) (F) (j) (P)

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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

SVEC-16

### 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            |
| 2 | a)       | Dariya an avaraggion for Quantization noise in a DCM System                                                                                                                                                     | $CO^{2}$   | 7 Mortes           |
| 3 | a)<br>b) | Compare the performance of PCM coded transmission systems using<br>BPSK and FSK modulation.                                                                                                                     | CO2<br>CO2 | 7 Marks<br>7 Marks |
|   |          | (OR)                                                                                                                                                                                                            |            |                    |
| 4 |          | Justify that the Output SNR in a PCM system is superior to that of a DM System.                                                                                                                                 | CO3        | 14 Marks           |
|   |          |                                                                                                                                                                                                                 |            |                    |
| 5 | a)       | Compare different types of digital modulation schemes                                                                                                                                                           | $CO^{2}$   | 6 Marka            |
| 5 | a)<br>b) | Implement a Digital system for generation and recention of RESK                                                                                                                                                 | $CO_2$     | 0 Marks            |
|   | 0)       | (OP)                                                                                                                                                                                                            | 000        | o wiaiks           |
| 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<br>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                                                                                                                                                                                      | CO1        | 2+2                |
|   | 0)       | i) Channel Canacity                                                                                                                                                                                             | 001        | Marks              |
|   |          | i) Rate of information                                                                                                                                                                                          |            |                    |
|   |          | ( <b>OR</b> )                                                                                                                                                                                                   |            |                    |
| 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, 1/9, 1/9, Estimate                                          | CO5        | 8 Marks            |
|   |          | 1/8, 1/8. Estimate                                                                                                                                                                                              |            |                    |
|   |          | i) the information contained in each message.                                                                                                                                                                   |            |                    |
|   |          | ii) average information per symbol.                                                                                                                                                                             |            |                    |
|   | 1.)      | iii) information rate.                                                                                                                                                                                          | 001        | 2 + 2              |
|   | D)       | i) Differentiate the terms Data and Information                                                                                                                                                                 | COI        | 3+3<br>Marks       |

# UNIT-V

- 9 a) Assess error detection and error correction capabilities of linear block CO4 6 Marks codes.
  - b) Design an encoder for generating (7,4) systematic cyclic code generated CO3 8 Marks by  $g(x)=1+x+X^3$ .

### (OR)

10 a) The generator matrix for a (6, 3) block code is given below. Construct all CO3 6 Marks 1 0 0 1 1 0

code vectors of this code.  $G = 0 \quad 1 \quad 0 \quad 0 \quad 1 \quad 1$ .

0 0 1 1 0 1

b) State and explain with examples about the Convolution Coding. CO4 8 Marks

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Time: 3 hours

Roll No.

### **SREE VIDYANIKETHAN ENGINEERING COLLEGE**

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

## MICROPROCESSORS AND MICROCONTROLLERS

[Electronics and Communication Engineering]

Max. Marks: 70

SVEC-16

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

| C | U | Ν | IT | <b>-I</b> | ) |
|---|---|---|----|-----------|---|
|   | _ | _ |    |           | _ |

| 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.                                                                                                                              | CO2 | 7 Marks  |
|   |    | i) ENDS. ii) EVEN. iii) DUP. iv) Assume.                                                                                                                                   |     |          |
|   |    | 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.                                                                                                                                     | CO1 | 7 Marks  |
|   | ,  | i) Mode Set Control Word. ii) BSR Mode.                                                                                                                                    |     |          |
|   | b) | Differentiate between automatic rotation and automatic EOI mode.                                                                                                           | CO2 | 7 Marks  |
|   |    | (OR)                                                                                                                                                                       |     |          |
| 6 | a) | Draw and explain ICW and OCW formats.                                                                                                                                      |     | 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:                                                                         | CO3 | 7 Marks  |
|   |    | i) Internal RAM. ii) External RAM.                                                                                                                                         |     |          |
|   | 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 CO5 7 Marks microcontroller.
  - b) Model the setup and develop an ALP to interface LCD with 8051 CO6 7 Marks microcontroller. Specify the applications of it.

### (OR)

- 10 a) Show the setup to interface seven segment displays with 8051 and write a CO5 7 Marks program for generating a sequence in seven segments depending on your own assumption.
  - b) Apply 8051 interfacing concept to interface 4 digits of 7 segment LED CO6 7 Marks display to Intel 8051. Mention the applications of it.

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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]

Max. Marks: 70

Time: 3 hours

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

# UNIT-I

| 1  | a)<br>b) | Why CMOS inverter is called a low power device? Explain.<br>Assess the Metallization and Encapsulation methods related to IC fabrication process.                                                               | CO3<br>CO2 | 6 Marks<br>8 Marks |
|----|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|
|    |          | (OR)                                                                                                                                                                                                            |            |                    |
| 2  | a)       | Derive an equation for Transconductance of an n channel enhancement<br>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, $\mu$ nCox = 95 $\mu$ A/V 2. Find its drain current and drain source resistance. | CO3        | 8 Marks            |
|    |          | UNIT-II                                                                                                                                                                                                         | <b>G A</b> | 0.14               |
| 3  | a)<br>b) | Sketch the stick diagram for NAND gate and give its procedural steps.<br>Discuss the limitations of scaling of MOS circuits.                                                                                    | CO4<br>CO1 | 8 Marks<br>6 Marks |
| 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            |
| 6  | a)       | (OR)<br>Outline the features of 4-by-4 barrel shifter using complementary                                                                                                                                       | CO4        | 8 Marks            |
|    |          | transmission gates. Sketch its circuit diagram and explain its shifting operation.                                                                                                                              |            |                    |
|    | b)       | Write short note on: i) Carry skip adder. ii) Carry select adder.                                                                                                                                               | CO1        | 6 Marks            |
| 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. (OR)                                                                                                                                        | CO2        | 7 Marks            |
| 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            |
|    |          |                                                                                                                                                                                                                 |            |                    |
| 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                                                                    | CO5        | 7 Marks            |
|    |          | and m-storage devices respectively.                                                                                                                                                                             |            |                    |
|    | b)       | Write short notes on Design strategies for test.                                                                                                                                                                | CO1        | 7 Marks            |
| 10 | - )      | (OR)                                                                                                                                                                                                            | 001        | 7 1 1              |
| 10 | a)       | Write short notes on UNUS testing.<br>Evamina Dowar minimization tashnigues in design and short made                                                                                                            | COI        | / Marks            |
|    | U)       | $\otimes$ $\otimes$ $\otimes$                                                                                                                                                                                   | COS        | / IVIAIKS          |

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### **SREE VIDYANIKETHAN ENGINEERING COLLEGE**

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

# MICROPROCESSORS AND INTERFACING

[Computer Science and Systems Engineering]

Time: 3 hours

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

Max. Marks: 70

SVEC-16

|    |    | 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<br>Intel 8086. Specify the applications of it | CO6 | 7 Marks    |
|    | b) | Briefly describe the importance of modem control in 8251                                                               | CO2 | 7 Marks    |
|    | 0) | (OR)                                                                                                                   | 002 | , 1.101110 |
| 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

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### 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**

Roll No.

All questions carry equal marks

#### UNIT-I (

| 1  |           | Write short notes on the following guided and unguided transmission medium                                                                        | CO1 | 14 Marks |
|----|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------|-----|----------|
|    |           | i) Twisted-Pairs. ii) Coaxial Cable.                                                                                                              |     |          |
|    |           | iii) Fiber Optics. iv) Radio Transmission.                                                                                                        |     |          |
|    |           | (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  |
| 5  |           | Illustrate the following congestion control algorithms with an example:i) Leaky bucket Algorithm.ii) Random Early Detection.(OR)                  | CO2 | 14 Marks |
| 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 | CO4 | 14 Marks |
|    |           | 1 KB packets.                                                                                                                                     |     |          |
|    |           | i) How long does the transmission take if an Additive Increase,                                                                                   |     |          |
|    |           | Multiplicative Decrease Control with a window size                                                                                                |     |          |
|    |           | of $w_g = 500 \text{ KB}$ is used?                                                                                                                |     |          |
|    |           | 11) Repeat part (1), using Slow-Start Control.                                                                                                    |     |          |
| Q  | a)        | (UR)<br>Draw the TCP segment header formet and explain the use of each field in                                                                   | CO1 | 7 Morka  |
| 0  | <i>a)</i> | detail                                                                                                                                            | COI | / WIAIKS |
|    | b)        | Summarize congestion control mechanisms in TCP.                                                                                                   | CO2 | 7 Marks  |
|    | ,         |                                                                                                                                                   |     |          |
| 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  |
|    |           | · · · · · · · · · · · · · · · · · · ·                                                                                                             |     |          |

Time: 3 hours

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### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

### LINUX PROGRAMMING

[Computer Science and Engineering]

Max. Marks: 70

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

# UNIT-I

| 1  | a)<br>b)   | Explain in detail about gethostname and uname function.<br>Write a linux program which extracts some user information from | CO1<br>CO3 | 7 Marks<br>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                                                  | CO3        | 7 Marks            |
|    | <b>b</b> ) | logs in.                                                                                                                   | CO6        | 7 Mortra           |
|    | 0)         | checks if every argument supplied is a file or a directory and reports                                                     | 000        | / Warks            |
|    |            | accordingly. Whenever the argument is a file, the number of lines on it is<br>also reported                                |            |                    |
|    |            | (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.                                      | COI        | 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                                                | CO4        | 8 Marks            |
|    |            | standard output converting into uppercase by using shell redirection.                                                      |            |                    |
| 8  | a)         | (OR)<br>Write a program that illustrates the working of signal                                                             | CO4        | 7 Marks            |
| 0  | b)         | Discuss the following commands with example:                                                                               | CO4        | 7 Marks            |
|    | 0)         | i) kill. ii) killall.                                                                                                      | 001        | , 1,100110         |
|    |            | 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.                                                                     | COI        | 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)                                                                               | 000            |                    |
| 2             | a)         | Why do artificial light sources tend to produce colored light?                     | CO2            | 8 Marks            |
|               | <b>D</b> ) | Explain about Color of surfaces.                                                   | COI            | 6 Marks            |
| •             | ,          |                                                                                    | <b>G A</b>     |                    |
| 3             | a)         | Write about Image De-noising in detail.                                            | CO3            | 10 Marks           |
|               | b)         | Develop an algorithm for Texture representation using Vector                       | CO4            | 4 Marks            |
|               |            | quantization.                                                                      |                |                    |
| Λ             | a)         | Develon Essential matrix and Eundamental matrix for Binocular camera               | CO4            | 7 Marks            |
| 7             | <i>a)</i>  | geometry and the epipolar constraint.                                              | 04             | / Iviaiks          |
|               | b)         | Show that a circle appears as an ellipse in an orthographic view, that the         | CO1            | 7 Marks            |
|               | /          | minor axis of this ellipse is the tilt direction, and that the aspect ratio is the |                |                    |
|               |            | cosine of the slant angle.                                                         |                |                    |
|               |            | 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                    | CO4            | 7 Marks            |
|               |            | algorithm.                                                                         |                |                    |
|               | b)         | Explain Divisive clustering with a graph and Develop an algorithm.                 | CO1,           | 7 Marks            |
|               |            |                                                                                    | CO4            |                    |
|               |            | (UNIT-IV)                                                                          |                |                    |
| 7             | a)         | Explain Receiver Operating Curves (ROC) in detail.                                 | CO2            | 10 Marks           |
|               | b)         | Define the following.                                                              | CO1            | 4 Marks            |
|               |            | 1) Error-rate. 11) Cross-validation.                                               |                |                    |
| 0             | - )        | ( <b>OR</b> )                                                                      | CO1            | 7 Maulaa           |
| 8             | a)<br>b)   | Explain Detecting humans using Sliding window method.                              |                | / Marks<br>7 Marks |
|               | 0)         | Explain Detecting boundaries using Shaing window method.                           | COI            | / WIAIKS           |
| 0             | ``         |                                                                                    | 001            |                    |
| 9             | a)         | Explain in detail about how to improve Current Image Features.                     | COI            | 8 Marks            |
|               | D)         | Describe the kinds of Image features.                                              | COI            | 6 Marks            |
| 10            | а)         | (UK)<br>Evolain approvimate Nearest neighbors by local sensitive hashing           | CO1            | 8 Marka            |
| 10            | a)<br>b)   | Describe about Ranking documents                                                   |                | 6 Marks            |
|               | 0)         | Desente about Ranking documents.                                                   | COI            | O WIAINS           |

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Time: 3 hours

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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]

Max. Marks: 70

SVEC-16

### 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                          | CO5 | 14 Marks |  |
|    |    | explain each in detail.                                                                         |     |          |  |
|    |    | 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 |  |
|    |    |                                                                                                 |     |          |  |
| 9  |    | Distinguish ultrasonic imaging systems (A B and M mode) with suitable                           | CO5 | 14 Marks |  |
| /  |    | diagrams.                                                                                       | 200 |          |  |
|    |    | (OR)                                                                                            |     |          |  |
| 10 |    | Identify the suitable instrument to analyze EGG and also explain principle                      | CO5 | 14 Marks |  |
|    |    |                                                                                                 |     |          |  |

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and working of required instrument with neat sketch.

Max. Marks: 70

### **SREE VIDYANIKETHAN ENGINEERING COLLEGE**

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# 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

Answer One Question from each Unit All questions carry equal marks

# UNIT-I

| 1  | a)<br>b) | Draw the block diagram of communication system and explain each block.<br>Determine the percentage saving when the carrier wave and one of the sidebands are suppressed in an AM wave modulated to a depth of:<br>i) 100% and ii) 50% | CO1<br>CO2 | 7 Marks<br>7 Marks |
|----|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|
|    |          | (OR)                                                                                                                                                                                                                                  |            |                    |
| 2  | a)       | Discuss about SSB-SC signal generation using phase shift method with suitable diagrams.                                                                                                                                               | CO5        | 8 Marks            |
|    | b)       | Differentiate:<br>i) Line communication and radio communication                                                                                                                                                                       | CO2        | 6 Marks            |
|    |          | ii) Analog and digital signals.                                                                                                                                                                                                       |            |                    |
| 3  | a)       | Derive the mathematical expression for FM wave and its modulation index.                                                                                                                                                              | CO1        | 7 Marks            |
|    | b)       | Derive the expression for narrow band FM.<br>(OR)                                                                                                                                                                                     | CO1        | 7 Marks            |
| 4  |          | Define frequency modulation. Derive the expression for single tone FM wave and specify the bandwidth requirements.                                                                                                                    | CO4        | 14 Marks           |
| ~  |          |                                                                                                                                                                                                                                       | 001        | 1434 1             |
| 2  |          | its advantages.                                                                                                                                                                                                                       | COI        | 14 Marks           |
|    |          | (OR)                                                                                                                                                                                                                                  |            |                    |
| 6  | a)       | Draw and explain PAM modulator.                                                                                                                                                                                                       | CO2        | 7 Marks            |
|    | D)       | UNIT-IV                                                                                                                                                                                                                               | 005        | / Marks            |
| 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.<br>(OR)                                                                                                                                                                     | CO3        | 6 Marks            |
| 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.                                                                                                                                                                             | COI        | 6 Marks            |
| 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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# III B.Tech I Semester (SVEC-16) Supplementary Examinations August - 2021

# COMPUTER ORGANIZATION AND ARCHITECTURE

[Electronics and Instrumentation Engineering]

Time: 3 hours

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

Max. Marks: 70

# 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    |
| 2  | Ň           | UNIT-II                                                                                                                                               | <b>GO2</b> |            |
| 3  | a)          | Design a 4 bit combinational circuit shifter.                                                                                                         | CO3        | 7 Marks    |
|    | b)          | Draw the flow chart to decode an instruction cycle.<br>(OR)                                                                                           | CO5        | 7 Marks    |
| 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    |
|    | - )         | (INTT-TIT)                                                                                                                                            |            |            |
| 5  | 2)          | Describe the control and status signals of 2005                                                                                                       | CO1        | 7 Mortes   |
| 3  | $a_{\rm h}$ | Describe the control and status signals 018085.                                                                                                       | CO1        | 7 Marks    |
|    | 0)          | applications.                                                                                                                                         | COS        | / IVIALKS  |
|    |             | (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    |
|    |             |                                                                                                                                                       |            |            |
| 7  | a)          | Draw and explain the 8085 interrupts and vector locations                                                                                             | CO1        | 7 Marks    |
| ,  | h)          | Interface two 2KB of EPROM to the 8085 processor by selecting suitable                                                                                | CO4        | 7 Marks    |
|    | 0)          | addresses                                                                                                                                             | 001        | / WILLING  |
|    |             | (OR)                                                                                                                                                  |            |            |
| 8  | a)          | Explain the addressing modes of 8085 with example                                                                                                     | CO1        | 7 Marks    |
| U  | h)          | Explain how a RAM chip $(1K \times 8)$ can be interfaced to $8085$                                                                                    | $CO^2$     | 7 Marks    |
|    | 0)          | microprocessor with the help of a diagram                                                                                                             | 002        | / 10101113 |
|    |             | 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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Time: 3 hours

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

# SENSORS AND SIGNAL CONDITIONING

[Electrical and Electronics Engineering]

Max. Marks: 70

SVEC-16

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

#### UNIT-I Explain the loading effect on the accuracy of a resistance potentiometer CO1 7 Marks a) transducer when used for measurement of displacement. Apply the conceptual knowledge for the measurement of Relative CO6 7 Marks b) humidity present in surrounding environment. (OR)Explain with the aid of a circuit diagram the principle of operation of a CO5 14 Marks strain measurement system with temperature compensation technique. UNIT-II How angular displacement is measured using capacitive transducer? CO1 14 Marks (**OR**) How is the rotational displacement measured by using capacitive CO1 14 Marks transducer? UNIT-III) Compare a total radiation pyrometer with an optical pyrometer in terms of a) CO1 7 Marks operation and construction details. Provide a feasible solution for the conversion of mechanical energy into 7 Marks b) CO4 electrical energy. (**OR**) Explain the principle of working and construction details of a photo-CO1 14 Marks voltaic cell. Explain why it is very useful for space applications. UNIT-IV Define digital sensor and explain the operation of position encoder with CO1 14 Marks neat sketch. (**OR**) Analyze in detail the fiber –optic sensors and explain its applications. CO<sub>2</sub> 14 Marks UNIT-V Sketch the block diagram of signal conditioning circuit and explain each CO3 14 Marks block in detail (**OR**) Choose an appropriate technique to measure Reactance and also explain CO5 14 Marks the operation in detail.

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### 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 a) Write the importance of modeling. CO1 4 Marks b) List and explain principles of modeling. CO1 10 Marks (**OR**) Categorize the basic building blocks of UML with examples. a) CO1 7 Marks Describe structural and behavioral diagrams of UML in detail. b) CO1 7 Marks UNIT-II ) Distinguish class diagram and object diagram. CO2 7 Marks a) Analyze and explain how to control the visibility of elements present in CO2 7 Marks b) package. (**OR**) Categorize the owned elements in packages. CO1 7 Marks a) b) Compare and contrast various adornments in dependency relationship. CO2 7 Marks (UNIT-III) Design and apply modeling techniques of use case diagram for ATM CO3 7 Marks a) application. Design a model for home automation system with class diagram. 7 Marks b) CO3 (**OR**) Design and apply modeling techniques of sequence diagram for School a) CO3 7 Marks monitoring system. Design a model for communication setup in mobile with sequence 7 Marks b) CO3 diagram. UNIT-IV) Discuss in detail about State machines along with simple state, nested CO4 14 Marks states, concurrent states, different events and action within each state for Point of Sale system. (OR)Describe the communication problems between thread states and thread 14 Marks CO4 lifecycle in state chart diagram. UNIT-V Design a model for online shopping through component diagram. CO5 7 Marks a) Design a model for client server communication through deployment CO5 7 Marks b) diagram. (**OR**) 10 Design and apply modeling techniques of component diagram for home CO5 7 Marks a) automation system. Design and apply modeling techniques of deployment diagram for library b) CO5 7 Marks information system.

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# 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,<br>CO2 | 7 Marks    |
|----|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------|
|    | b) | Explain the following HTML tags with suitable example.<br>i) <pre>, ii) <canvas>, iii) <img/>, iv) <div>.</div></canvas></pre>                                                                            | CO1         | 7 Marks    |
| 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.<br>i) <font>. ii) <meta/>. iii) . iv) <video>.</video></font>                                                                                      | 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) | i) Window. ii) Document.                                                                                                                                                                                  | COI         | 7 Marks    |
|    | b) | Develop a web page to convert Indian rupees to Foreign currency. Read<br>the Indian rupees through input dialog and select foreign currency to<br>which Indian rupees are converted using drop down menu. | CO6         | 7 Marks    |
| 5  |    | Develop a mobile optimized website for displaying the images using responsive classes.                                                                                                                    | CO5         | 14 Marks   |
| ~  |    | (OR)                                                                                                                                                                                                      | 005         | 1477 1     |
| 6  |    | UNIT-IV                                                                                                                                                                                                   | 005         | 14 Marks   |
| 7  | a) | Build a PHP Page that reads User Name and Favorite Color from the html<br>form and then display user name in green color and sets user favorite<br>color as a background color to the web page            | CO4         | 8 Marks    |
|    | b) | Demonstrate the implementation of Object Cloning in PHP                                                                                                                                                   | CO1         | 6 Marks    |
|    | 0) | (OR)                                                                                                                                                                                                      | 001         | 0 11100110 |
| 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    |
| 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, while the massage and where the terms)                   | CO3         | 7 Marks    |
|    |    | subject, message and submit button).                                                                                                                                                                      |             |            |

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## 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:<br>$position := initial + rate \times 60$ | 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:<br>intgcd (int m, int n)                                                                                   | CO1 | 7 Marks            |
|   |          | if $n == 0$ then return (m);                                                                                                                                         |     |                    |
|   |          | else return (gcd (n, m mod n));                                                                                                                                      |     |                    |
|   |          | }                                                                                                                                                                    |     |                    |
| _ |          | UNIT-II                                                                                                                                                              |     |                    |
| 3 | a)       | Construct the predictive parsing table for the following grammar.                                                                                                    | CO3 | 6 Marks            |
|   | b)       | $S \rightarrow iEtSS/a, S \rightarrow iEtSSeS/e, E \rightarrow b$<br>Explain about L off Pocursion                                                                   | CO1 | 8 Marka            |
|   | 0)       | (OR)                                                                                                                                                                 | COI | o wiaiks           |
| 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          | CO3 | 7 Marks            |
|   |          | $E \rightarrow E - E$                                                                                                                                                |     |                    |
|   |          | $E \rightarrow E^*E$                                                                                                                                                 |     |                    |
|   |          | E→id                                                                                                                                                                 |     |                    |
|   | 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)                                                                                                                                                                 | 001 | - > < 1            |
| 6 | a)<br>b) | Write notes on type conversion.                                                                                                                                      | COI | 7 Marks<br>7 Marks |
|   | D)       | UNIT-IV                                                                                                                                                              | COI | / Marks            |
| 7 |          | Explain the usage of different storage allocation strategies.<br>(OR)                                                                                                | CO6 | 14 Marks           |
| 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

Describe about principal sources of optimization. 9 CO1 7 Marks a) Explain the different issues in the design of a code generator. b) CO1 7 Marks (OR) Generate and Analyze the code for the following C statements: 10 CO2 14 Marks i) x = f(a) + f(a) + f(a). ii) x = f(a)/g(b,c). iii) x = f(f(a)).

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

#### MODELING AND SIMULATION [Computer Science and Engineering]

Time: 3 hours

Max. Marks: 70

SVEC-16

### 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 CO1 9 Marks the following systems.
  - 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 CO1 5 Marks book?

(**OR**)

2 Consider the following continuously operating job shop. Inter-arrival CO2 14 Marks times of jobs are distributed as follows:

| Time Between<br>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 CO1 9 Marks simulation.
  - b) A production process manufactures alternators for outboard engines used CO3 5 Marks 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?

(OR)

|    |    | (011)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |             |
|----|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------------|
| 4  | a) | Describe useful statistical models and its situations that arise to conduct simulation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | CO1 | 9 Marks     |
|    | b) | <ul> <li>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.</li> <li>i) What is the probability that the first order will come on the fourth sales call of the day?</li> <li>ii) If eight sales calls are made in a day, what is the probability of receiving exactly six orders?</li> <li>iii) If four sales calls are made before lunch, what is the probability that one or fewer results in an order?</li> </ul> | CO4 | 5 Marks     |
| 5  |    | Explain the characteristics of quousing systems                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | CO1 | 14 Marka    |
| 5  |    | Explain the characteristics of quedeing systems.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | COI | 14 Iviai KS |
|    | ,  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 901 | - > < 1     |
| 6  | a) | Describe the long-run measures of performance of queueing systems.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | COI | 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 CO6 3 Marks where  $\theta = 2$  and k = 1, 2, 4, and 8.

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### 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 Ouestion from each Unit** All questions carry equal marks UNIT-I Given the sequence x(n) = (6 - n)[u(n) - u(n - 6)], make a sketch of: 1 CO4 8 Marks a) i) y(n) = x(4 - n). ii)  $y(n) = x(n^2 - 2n + 1)$ . State and prove any two properties of DTFT. 6 Marks CO2 b) (**OR**) State and prove the necessary and sufficient condition for causality of an 2 a) CO<sub>2</sub> 7 Marks LTI discrete time system. The system is represented by the difference equation: CO4 7 Marks b) y(n) = x(n+1) + 3x(n) + 5x(n-1)Is the system causal, stable, and time invariant? Justify your answer. UNIT-II ) Determine the circular convolution of the sequences. 3 CO2 8 Marks a)  $X_1(n) = \{1, 1, -1, -1\}$  and  $X_2(n) = \{1, 0, -1, 0, -1\}$ Sketch the radix 2 DIF FFT structure when N=16. CO1 6 Marks b) (**OR**) Draw the radix 2 DIT FFT structure when N=16. 7 Marks 4 a) CO1 State and prove the circular time shifting property of DFT. 7 Marks b) CO2 (UNIT-III) Convert the analog filter into digital filter whose system function is CO5 5 a) 7 Marks  $H(s) = \frac{(s+0.2)}{(s+0.2)^2+9}$  using impulse invariant method. b) Derive an expression for order of the chebhyshev analog prototype filter. CO<sub>2</sub> 7 Marks (**OR**) Using bilinear transformation design a digital bandpass butter worth filter CO5 6 a) 10 Marks with the following specifications. sampling frequency=8KHz. αp=2dBin passband 800Hz≤f≤1000Hz.  $\alpha$ s=20dB in stopband  $0 \le f \le 400$ Hz and 200Hz  $\le f \le \infty$ . b) Discuss transpose form of second order IIR system realizations. CO2 4 Marks (UNIT-IV) Distinguish the window functions used in the design of FIR filters. 7 a) CO<sub>2</sub> 7 Marks Design a linear phase FIR Lowpass filter using rectangular window with b) CO3 7 Marks cut off frequency  $Wc=0.2\pi$  rad/sample and N=7. (**OR**) Design Low pass FIR filter for the desired frequency response CO3 8 a) 7 Marks  $H_d(w) = \begin{cases} e^{-j2w} - \pi / 4 \le \omega \le \pi / 4 \\ 0 & \pi / 4 \le \omega \le \pi \end{cases}$  using Rectangular window when N=5. Design a linear phase FIR bandstop filter to reject frequencies in the range CO3 7 Marks b)  $0.35\pi$  to  $0.48\pi$  rad/sample by taking 75 samples of rectangular window.

# UNIT-V

- 9 a) Write the silent features of TMS320C6X family of digital signal CO1 7 Marks processor.
  - 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 CO1 7 Marks processor.

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Time: 3 hours

Roll No.

#### **SREE VIDYANIKETHAN ENGINEERING COLLEGE**

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

### IMAGE PROCESSING [Information Technology]

Max. Marks: 70

SVEC-16

Answer One Question from each Unit All questions carry equal marks

# UNIT-I

| 1 | a)<br>b) | Write the Applications of Image Transforms.                                                                                                 | CO6 | 6 Marks<br>8 Marks |
|---|----------|---------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------------|
|   | 0)       | i) Scaling ii) Shifting                                                                                                                     | COI | o warks            |
|   |          | iii) Rotation iv) Convolution                                                                                                               |     |                    |
|   |          | (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:                                                                                                                     | CO1 | 7 Marks            |
|   |          | i) Inter pixel redundancy.                                                                                                                  |     |                    |
|   |          | 11) Psychovisual Redundancy.                                                                                                                |     |                    |

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# 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 |

Time: 3 hours

Roll No.

### **SREE VIDYANIKETHAN ENGINEERING COLLEGE**

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

### WIRELESS NETWORKS [Information Technology]

Max. Marks: 70

SVEC-16

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  |
| 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  |
| 4  | a) | Evaluate five different cell types in the cellular hierarchy and compare<br>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  |
| 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:                     | CO4 | 14 Marks |
|    |    | 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.                                                                                                 |     |          |

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CODE No.:14BT40503 SVEC-14 Roll No. SREE VIDYANIKETHAN ENGINEERING COLLEGE (An Autonomous Institution, Affiliated to JNTUA, Anantapur) III B.Tech II Semester (SVEC14) Supplementary Examinations August – 2021 **DESIGN AND ANALYSIS OF ALGORITHMS** [Information Technology] Time: 3 hours Max. Marks: 70 **Answer One Ouestion 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 Write and explain the final Algorithm for collapse Rule with an example. 7 Marks a) 7 Marks Explain about various Asymptotic Notations. b) UNIT-II ) Write a Pseudo code for Divide and Conquer algorithm for merging two sorted 3 7 Marks a) arrays into a single sorted one with example. Explain graph traversal algorithm with examples. 7 Marks **b**) **(OR)** Explain Strassen's matrix multiplication algorithm with example. 7 Marks 4 a) Find the Best, Worst and Average case complexities of Quick Sort algorithm. 7 Marks **b**) (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 14 Marks 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. (**OR**) 6 Write and explain the general method of Greedy Technique in detail. 14 Marks UNIT-IV) Apply back tracking to solve sum of subsets problem for the following instance 7 14 Marks  $S = \{1, 3, 4, 5\}, d = \{1, 2, 1, 3\}.$ (**OR**) Write a short notes on: 8 10 Marks a) i) Graph coloring. ii) Hamiltonian cycles. Explain the general method Branch and Bound Algorithm. 4 Marks b) UNIT-V Compare and contrast Deterministic and Non-Deterministic algorithms. 9 7 Marks a) Explain the Searching process using non deterministic algorithms. Explain NP-hard Scheduling problems with examples. 7 Marks b) (**OR**) 10 Explain the Cook's theorem with example. 14 Marks ලිවු ද්මට ද්ෂි

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

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

**REINFORCED CEMENT CONCRETE STRUCTURES – II** 

[ CIVIL ENGINEERING ]

Max. Marks: 70

14 Marks

Time: 3 hours

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

### UNIT-I

- 1 Explain the different types of stair case with neat sketch
- (OR)
   Design a dog-legged stair case for a building in which the vertical distance is 14 Marks 3.6m. The stair hall measures 2.5m x 5.0m. The live load may be taken as 2.5 kN/m<sup>2</sup>. Use M20 grade concrete and Fe415 grade steel. Draw a neat sketch showing reinforcement details in the waist slab

### UNIT-II

3 Design a combined rectangular footing for two columns C1 and C2 spaced at 14 Marks 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<sup>2</sup>.

#### (**OR**)

4 Design a pile under a column transmitting an axil load of 500kN. The pile is to 14 Marks be driven to a hard stratum available at a depth of 8m. Use M20 concrete and Fe: 415 steel.

### (UNIT-III)

- 5 Describe the behaviour of the various elements of a counterfort retaining wall 14 Marks and write the design steps of this retaining wall.
  - (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<sup>3</sup>; Angle of repose: 33<sup>o</sup>; S.B.C. of soil: 160 kN/m<sup>2</sup>; Spacing of counterforts :3m c/c

### UNIT-IV

7 Design a rectangular water tank 5m x 4m with depth of storage 3m, resting on 14 Marks 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

#### (OR)

8 Design a conical dome roof for a room with base diameter as 10m. The live load 14 Marks due to wind, snow, etc may be taken as 2N/m. The height of the roof is 4m.

### 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 14 Marks unit weight 15.5kN/m<sup>3</sup> and  $\phi = 25^{\circ}$ .

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SVEC-14

Roll No.

### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

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

#### **TRANSPORTATION ENGINEERING - I**

#### [Civil Engineering]

Time: 3 hours

Max. Marks: 70

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

# UNIT-I

- 1 a) What is highway alignment? What factors are to be given consideration while 7 Marks fixing the alignment? Also discuss the role of obligatory points in finalizing alignment.
  - b) Calculate the length of transition curve and the shift using the following data: 7 Marks 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

#### (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 7 Marks highway. Compute the set-back distances required from the centre line on the inner of the curve so as to provide for:
  - 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 14 Marks drainage of slopes and erosion control.

#### (OR)

4 The maximum quantity of water expected in one of the open longitudinal drains on 14 Marks clayey soil is 0.9 m<sup>3</sup>/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.

### UNIT-III)

5 a) Explain design of Dowel bars along with equations.
b) Calculate the stresses at interior, edge and corner regions of a cement concrete 7 Marks pavement using Westergaard's stress equation. Use the following data: Wheel load, P=5100kg.
Modulus of elasticity of cement concrete, E=3.0×105 kg/cm<sup>2</sup> Pavement thickness, h=18cm Poisson's ratio of concrete, µ=0.15 Modulus of sub grade reaction ,K=6.0 kg/cm<sup>3</sup> Radius of contact area, a=15cm

#### (OR)

6 Elaborate IRC recommended procedure for design of rigid pavements.

# UNIT-IV

| 7  | a) | What are the materials used in Cement Concrete roads? Write the construction        | 7 Marks  |  |  |  |
|----|----|-------------------------------------------------------------------------------------|----------|--|--|--|
|    |    | procedure of CC Pavements.                                                          |          |  |  |  |
|    | 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       | 7 Marks  |  |  |  |
|    |    | following:                                                                          |          |  |  |  |
|    |    | 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:                                                                               |          |  |  |  |
|    |    | i) rails. ii) sleepers. iii) ballast.                                               |          |  |  |  |
|    |    | (OR)                                                                                |          |  |  |  |
| 10 | a) | Elaborate factors affecting selection of site for Airport.                          |          |  |  |  |
|    | b) | What are the different types of horizontal and vertical curves? Derive the relation |          |  |  |  |

b) What are the different types of horizontal and vertical curves? Derive the relation 7 Marks between radius and versine of the curve.

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CODE No.:14BT60207 SVEC-14 Roll No. SREE VIDYANIKETHAN ENGINEERING COLLEGE (An Autonomous Institution, Affiliated to JNTUA, Anantapur) **III B.Tech II Semester (SVEC14) Supplementary Examinations August – 2021 HIGH VOLTAGE ENGINEERING** [Electrical and Electronics Engineering] Time: 3 hours Max. Marks: 70 **Answer One Question from each Unit** All questions carry equal marks UNIT-I Enumerate the various applications of insulating materials. 7 Marks 1 a) Estimate the control of electric stresses in the insulating materials. 7 Marks b) (**OR**) Distinguish between solid, liquid, gaseous breakdown theories. 7 Marks 2 a) Discuss about the electric field stresses in the insulating materials. 7 Marks b) UNIT-II ) 3 Write about the composite dielectrics along with its properties. 7 Marks a) Explain the process of thermal breakdown in solid dielectrics. 7 Marks b) (**OR**) State Paschen's law? How do you account for the minimum voltage for 14 Marks 4 breakdown under PD condition? UNIT-III) 5 What is a Tesla coil? How is damped high frequency oscillations obtained from 7 Marks a) a Tesla coil? Explain one method of controlled tripping of impulse generators. Why is 7 Marks b) controlled tripping necessary? (**OR**) 6 Why is a Cockcroft-Walton circuit preferred for voltage multiplier circuits? 14 Marks Explain its working with a schematic diagram. UNIT-IV) 7 Explain the different methods of high current measurements with their relative 14 Marks merits and demerits. (**OR**) What are the conditions to be satisfied by a potential divider to be used for 8 7 Marks a) impulse work? What is a mixed potential divider? How it is used for impulse voltage 7 Marks b) measurements? UNIT-V 9 What is 'Wagner's earthing device'? Explain how it is used for eliminating stray 14 Marks capacitances. (**OR**) 10 Explain the power frequency and impulse voltage test conducted on bushings. 14 Marks \$} {} ද්මට

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(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

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

#### **OPERATIONS RESEARCH**

#### [Mechanical Engineering]

Time: 3 hours

5

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.  $Min \ Z = x_1 + 2x_2 + 3x_3$   $st \quad x_1 - x_2 + x_3 \ge 4$   $x_1 + x_2 + 2x_3 \le 8$   $x_2 - x_3 \ge 2 \quad x_i \forall i \ge 0$  14 Marks

UNIT-II

**3** Solve the following transportation problem. Use North-West method for 14 Marks generating the initial basic feasible solution.

| Demand      | S <sub>1</sub> | S <sub>2</sub> | $S_3$ | S <sub>4</sub> | Supply |  |  |
|-------------|----------------|----------------|-------|----------------|--------|--|--|
| Factory     |                |                |       |                |        |  |  |
| А           | 7              | 10             | 12    | 10             | 40     |  |  |
| В           | 9              | 12             | 10    | 10             | 30     |  |  |
| С           | 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 14 Marks for the day. Five jobs are offered with the expected profit (in hundreds of rupees) for each machinist on each job being as follows.

| Machinist | A | B | С  | 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)

From the activity details given below, determine the optimal project duration by 14 Marks taking indirect cost as Rs.4.50/day.

| Activity Normal |            | Crash      | Cost slope |  |  |  |
|-----------------|------------|------------|------------|--|--|--|
|                 | time(days) | time(days) | Rs/day     |  |  |  |
| 1-2             | 3          | 1          | 4          |  |  |  |
| 2-3             | 4          | 2          | 4          |  |  |  |
| 2-4             | 7          | 3          | 1          |  |  |  |
| 3-4             | 5          | 2          | 2          |  |  |  |
|                 |            |            |            |  |  |  |

2

A distance network consists of 11 nodes which are distributed as shown in the 14 Marks following table. Find the shortest path from node 1 to node 11 and the corresponding distance.

Distance

12

7 9

6

13

4

2

15

Arc

5-8

5-9

6-9

7-9

7-10

8-11

9-11

10-11

- UNIT-IV) 7 A bank has 2 tellers working on SB A/c. The first teller handles withdrawals 14 Marks 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?
  - (**OR**)
- 8 Explain about various types of customers in queuing theory. a) In a railway yard goods train arrive at a rate of 30 trains/day. Assuming that the b)
  - inter-arrival time follows an exponential distribution and service time distribution is also exponential with an average 36 minutes. Calculate the following:
    - i) The average number of trains in the queue.

Arc

1-2

1-3

1-4

2-5

3-5

3-6

3-7

4-7

Distance

8

7

1

5

9

2

8

10

- 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

Find the optimum strategies and value of game for the following game by 14 Marks 9 graphical method.

|   | _ |    | I   | 3  |    |   |
|---|---|----|-----|----|----|---|
| ٨ |   | 1  | 2   | 3  | 4  | 5 |
| A | 1 | -1 | 3   | 4  | -2 | 6 |
|   | 2 | 4  | 2   | 6  | 3  | 2 |
|   |   |    | (OF | R) |    |   |

State the dominance rules used in games theory. 10 a)

6

Obtain the optimal strategies for both persons and the value of the game for b) 7 Marks zero-sum two-person game whose payoff matrix is given as follows

|          |    |             | Play | er A |   |    |   |
|----------|----|-------------|------|------|---|----|---|
| Player B | 1  | 3           | -1   | 4    | 2 | -5 |   |
|          | -3 | 5           | 6    | 1    | 2 | 0  |   |
|          | Ś  | <u>4</u> 9- | £3   |      |   |    | - |

7 Marks

7 Marks

Time: 3 hours

### 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]

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   |
|----|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
|    | D)       | Explain various applications of Microwaves                                                                                                                         | 4 Marks    |
| 2  | a)       | Prove that the rectangular waveguide is high pass filter. Define the terms cut-off                                                                                 | 7 Marks    |
|    |          | frequency and cut-off wavelength.                                                                                                                                  |            |
|    | b)       | Show that the velocity of the wave in waveguides is a function of frequency.                                                                                       | 7 Marks    |
|    |          | what is guide wavelength?                                                                                                                                          |            |
|    |          |                                                                                                                                                                    |            |
| 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.                                                                                                                                | 14 Marks   |
|    |          | 1) Directional coupler.                                                                                                                                            |            |
|    |          | 11) Wave guide windows.                                                                                                                                            |            |
|    |          | 111) Flap attenuator.                                                                                                                                              |            |
|    |          | (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    |
|    | -        |                                                                                                                                                                    |            |
| 7  | a)       | What are the salient features of TWT? How it is able to give large bandwidth                                                                                       | 6 Marks    |
| /  | a)<br>b) | A TWT operators at $f = 2$ GHz. The slow wave structure has a nitch angle of $5^{\circ}$                                                                           | 8 Marks    |
|    | 0)       | A Twi operates at $1 - 5$ GHz. The slow wave structure has a pitch angle of 5<br>and the attenuation constant is 3 Nn/m. Determine the propagation constant of the | o wiaiks   |
|    |          | travelling wave in the tube                                                                                                                                        |            |
|    |          | (OR)                                                                                                                                                               |            |
| 8  | a)       | Draw the structure of 8 cavity magnetron and explain its bunching process                                                                                          | 7 Marks    |
| 0  | h)       | Explain how cross field is used to generate oscillations in Magnetron                                                                                              | 7 Marks    |
|    | 0)       |                                                                                                                                                                    | , 1,101110 |
|    |          | 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    |
|    |          |                                                                                                                                                                    |            |

SVEC-14

CODE No.:14BT60403

SVEC-14

### SREE VIDYANIKETHAN ENGINEERING COLLEGE

Roll No.

(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 Ouestion from each Unit** All questions carry equal marks

### UNIT-I

- 1 With neat diagrams, explain the different steps in n-well fabrication of CMOS 8 Marks a) transistors.
  - Define threshold voltage of a MOS device and explain its significance. 6 Marks b) (**OR**)
- Illustrate an equation for I<sub>DS</sub> of an n-channel Enhancement MOSFET operating 2 a) 8 Marks in linear region.
  - Estimate  $g_m$  of the device for a PMOS transistor is operating in saturation 6 Marks **b**) region with the following parameters.

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

### UNIT-II)

What are various limitations of scaling? 4 Marks 3 a) Design a symbolic layout for a complementary CMOS circuit that implements 10 Marks b) Y = (A+BC)'.

#### (**OR**)

Drive an expression for a nMOS inverter pair delay whose transistor size is 4:1. 8 Marks 4 a) Drive the expression for effective resistance and capacitance estimation using b) 6 Marks RC delay models.

### UNIT-III)

- 5 Explain the operation of 8 x 8 array multiplier with neat sketch 8 Marks a) With the help of the logical schematic, explain the working of a parity 6 Marks b) generator. (**OR**) Explain the CMOS system design based on the data path operators with a 6 a) 6 Marks suitable example. Discuss the working principle of booth multiplier with an example. b) 8 Marks UNIT-IV Design an OR-AND PLA that provides the following outputs. 7 8 Marks a) F1 = M2. M3. M5F2 = M0. M1. M4F3 = M1. M2. M6. M7 With neat diagram, explain the operation of synchronous counter. 6 Marks b) (**OR**) With neat sketch, explain CLB, IOB and programmable interconnects of FPGA 8 Marks 8 a) device.
  - Compare the features of PLA, PAL, CPLD and FPGAs. **b**)

# UNIT-V

- **9** a) Explain the various logic synthesis tools available for ASIC and FPGA-based 7 Marks design.
  - b) Explain various types of simulation.

7 Marks

### (OR)

- **10** a) What is need for testing? Explain the difference between testing and 6 Marks verification.
  - b) Explain the chip level test techniques. Explain the chip level test techniques. 8 Marks

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

#### **PRINCIPLES OF COMMUNICATION**

[Electronics and Instrumentation Engineering]

**Time: 3 hours** 

Answer One Question from each Unit

All questions carry equal marks

# UNIT-I

| 1  | a)  | Find the Fourier transform of cosw <sub>0</sub> t and sinw <sub>0</sub> 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.                                                                                                               | / Marks  |
|    |     | UNIT-IV                                                                                                                                                            |          |
| 7  | a)  | Derive the expression for signal to quantization noise ratio for PCM system that<br>employs linear quantization technique. Assume the input to the PCM system is a | 7 Marks  |
|    | 1 \ | sinusoidal signal.                                                                                                                                                 | 7 1 1    |
|    | D)  | Distinguish between QPSK and MSK.                                                                                                                                  | / Marks  |
| 8  | a)  | (UN)<br>Explain the delta modulation with block diagram. Discuss the disadvantages of                                                                              | 8 Marks  |
| 0  | a)  | delta modulation                                                                                                                                                   | 0 WIGINS |
|    | 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                                                                                       | 7 Marks  |
|    |     | (n,k) cyclic code? Explain.                                                                                                                                        |          |
|    |     | (OR)                                                                                                                                                               |          |
| 10 | a)  | Find a generator polynomial for a (7, 4 cyclic code and hence find the code word for[1000].                                                                        | 7 Marks  |
|    | h)  | Consider 5 messages with probabilities 0.22 0.34 0.17 0.19 0.08 are                                                                                                | 7 Marks  |

Consider 5 messages with probabilities 0.22, 0.34, 0.17, 0.19, 0.08 are / Marks D) transmitted. Estimate its coding efficiency using Huffman code.

Max. Marks: 70

(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)<br>b) | <ul> <li>Write about register transfers and Register Transfer language with an example.</li> <li>Interpret the binary division to an example -7/-3.<br/>(OR)</li> </ul>                                |                    |
|----|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| 2  | a)<br>b) | Discuss in detail logic micro operations.<br>Distinguish between floating point addition and subtraction using flowcharts.                                                                             | 7 Marks<br>7 Marks |
| 3  | a)       | Compare and contrast Micro programmed control unit and Hardwired control Unit.                                                                                                                         | 7 Marks            |
|    | b)       | Discuss in detail about computer instructions.<br>(OR)                                                                                                                                                 | 7 Marks            |
| 4  | a)<br>b) | Write about Micro Programmed control unit in detail.<br>Distinguish between Micro programmed control unit and Hardwired control<br>Unit.                                                               | 7 Marks<br>7 Marks |
|    |          | UNIT-III                                                                                                                                                                                               |                    |
| 5  | a)       | Draw the block diagram of interface between a processor and peripheral devices<br>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            |
| 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           |
| 7  |          | What is the need for having a hierarchical memory organization and explain the                                                                                                                         | 14 Marka           |
| ,  |          | same with a neat sketch.                                                                                                                                                                               |                    |
|    |          | (OR)                                                                                                                                                                                                   |                    |
| 8  | a)       | Define basic terms Hit, Miss and miss penalty and explain how to compute<br>performance of cache memory                                                                                                | / 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            |
| 10 | a)       | (OK)<br>Explain Inter Process Arbitration in detail                                                                                                                                                    | 7 Marks            |
| 10 | 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            |
|    |          |                                                                                                                                                                                                        |                    |

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(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

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

#### **DESIGN AND ANALYSIS OF ALGORITHMS**

[Information Technology]

Max. Marks: 70

Answer One Question from each Unit All questions carry equal marks

# UNIT-I

| 1  | a)<br>b) | Write and explain the final algorithm for collapse Rule with an example.<br>Explain about various Asymptotic Notations.<br>(OR)                                                                                                                           | 7 Marks<br>7 Marks |
|----|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| 2  | a)<br>b) | Explain various constructs of Pseudo code to write an algorithm.<br>Write algorithms for Union to combine two sets.                                                                                                                                       | 7 Marks<br>7 Marks |
|    |          | UNIT-II                                                                                                                                                                                                                                                   |                    |
| 3  | a)<br>b) | Explain various Graph Traversal Search Techniques with an example.<br>What is biconnected Graph? Explain how to test a graph is biconnected or not.<br>(OR)                                                                                               | 7 Marks<br>7 Marks |
| 4  |          | Write the algorithm for Binary Search using Divide and conquer technique and find its complexity.                                                                                                                                                         | 14 Marks           |
|    |          | (UNIT-III)                                                                                                                                                                                                                                                |                    |
| 5  | a)<br>b) | Write the Control abstraction for Greedy method.<br>Write an algorithm to find out the single source shortest problem using Greedy method.                                                                                                                | 7 Marks<br>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)<br>b) | Write an algorithm of M-coloring problem.<br>Solve the n-Queens problem using backtracking.                                                                                                                                                               | 7 Marks<br>7 Marks |
| 8  | a)       | Write about Hamilton – Cycles.                                                                                                                                                                                                                            | 7 Marks            |
|    | b)       | Explain about FIFO Branch and Bound Solution.                                                                                                                                                                                                             | 7 Marks            |
|    |          |                                                                                                                                                                                                                                                           |                    |
| 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            |
| 10 | a)       | (OR)<br>Write a Non-deterministic algorithm for sorting                                                                                                                                                                                                   | 7 Mortes           |
| 10 | a)<br>b) | Write a Non-deterministic algorithm to solve Knapsack problem.                                                                                                                                                                                            | 7 Marks            |
|    |          | -<br>& & &                                                                                                                                                                                                                                                |                    |
|    |          |                                                                                                                                                                                                                                                           |                    |

Time: 3 hours

(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

7

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

# UNIT-I

- Define constructor and explain rules for writing constructors and types of 1 a) 7 Marks constructors with an example.
  - Explain method overloading in JAVA and write a java program to overload print 7 Marks b) method to print different data type values.

#### (**OR**)

- Explain type conversation and type casting with examples. 7 Marks 2 a)
  - Write a java program to read six subject marks of a student and find the total and 7 Marks b) average of marks using arrays.

### UNIT-II)

Define inheritance and explain different kind of inheritance with a suitable 14 Marks 3 example.

#### (**OR**)

#### Explain super keyword in java with examples. 7 Marks 4 a) Describe abstract class with an example. 7 Marks b)

### UNIT-III)

Explain the life cycle of thread with a neat diagram. 14 Marks 5

(**OR**)

Specify the benefits of exception handling in java, write a java program to 6 14 Marks represent at least five exception handling concept.

### UNIT-IV

Explain life cycle of an applet. a) Explain Layout managers and write a java program to create a login page using 7 Marks b) Flow Layout?

#### (OR)

- Write a java applet program to design a login page and when user click sign in 8 7 Marks a) button the entered username and password should be displayed on the applet window.
  - Explain Checkbox Group component and methods, event associated with it. 7 Marks b)

# UNIT-V

#### Explain life cycle of a servlet. 9 a) Explain ServletContext. b)

### (**OR**)

- Explain ResultSet with an example jdbc program. **10** a)
  - Explain javax.servlet.ServletRequest and javax.servlet.ServletResponse. 7 Marks b)

Max. Marks: 70

7 Marks

7 Marks

7 Marks

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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

3

Max. Marks: 70

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

### UNIT-I

a) With a neat block diagram, explain the architecture of 8086 Microprocessor.
b) Write an assembly language program for 8086 microprocessor to reverse a given 7 Marks string: "Microprocessors for IT".

#### (**OR**)

- **2** a) Explain different addressing modes of 8086 microprocessor with suitable 8 Marks examples.
  - b) Explain the following string manipulation instructions of 8086 with suitable 6 Marks examples.

a) Compose Intel 8086 Interrupt supporting structure.
b) Interface 4KX8 EPROM and 8KX8 RAM to Intel 8086 starting at FF000H and 7 Marks 00000H respectively.

#### (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 7 Marks microprocessor.

### UNIT-III

| 5  | a)<br>b) | Develop ALP to Initialize 8251A to send and receive characters on polled basis.<br>Differentiate synchronous to asynchronous serial transmission methods | 8 Marks<br>6 Marks |
|----|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
|    | 0)       | (OR)                                                                                                                                                     | 0 10 10 10 10      |
| 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                                                                                    | 7 Marks            |
|    |          | XTAL=11.0592 MHz.                                                                                                                                        |                    |
|    |          | (OR)                                                                                                                                                     |                    |
| 10 | a)       | Discuss the interrupt structure of 8051. Mention the priority. Explain how least                                                                         | 9 Marks            |
|    |          | priority is made as highest priority.                                                                                                                    |                    |
|    | b)       | List out the steps involved in programming the 8051 to transfer data serially.                                                                           | 5 Marks            |
|    |          | (A) (A) (A)                                                                                                                                              |                    |

(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

### 

| 1 | a)<br>b) | Explain the operation of IGBT in detail.                                                                                                                                                                                                                                              | 7 Marks<br>7 Marks |
|---|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
|   | 0)       | (OR)                                                                                                                                                                                                                                                                                  | / WIAIKS           |
| 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<br>and sketch the associated waveforms for $\alpha = 120^{\circ}$                                                                                                                                       | 7 Marks            |
|   | b)       | A single phase fully controlled converter is supplied at 220V, 50Hz. Determine                                                                                                                                                                                                        | 7 Marks            |
|   |          | the average load voltage for purely resistive load when the firing angle is $45^{\circ}$ .                                                                                                                                                                                            |                    |
|   |          | (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                                                                                                                                                                                                      | 14 Marks           |
| - |          | the expressions for rms value of load voltage and load current.<br>(OR)                                                                                                                                                                                                               |                    |
| 6 | a)       | Illustrate the operation of single phase bridge type cycloconverter with RL load.                                                                                                                                                                                                     | 10 Marks           |
|   |          | Draw relevant waveforms.                                                                                                                                                                                                                                                              | 125.1              |
|   | 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            |
| 9 |          | Describe the working of a single phase full bridge inverter with relevant circuit                                                                                                                                                                                                     | 14 Marks           |
| , |          | and waveforms.                                                                                                                                                                                                                                                                        | I I IVIUINS        |
|   |          |                                                                                                                                                                                                                                                                                       |                    |

#### (OR)

**10** Explain sinusoidal pulse modulation used for PWM inverters. Write the 14 Marks important features of the same.

\$\$ \$\$ \$\$

Time: 3 hours

### 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]

Max. Marks: 70

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

# UNIT-I

- Derive an expression for radius of neutral axis for circular cross section. 4 Marks 1 a)
  - A load of 10kN is applied to a steel curved beam as shown in the figure. b) Compute the increase in distance between the points A and B due to the load. Assume  $G = 0.84 \times 105 \text{ N/mm}^2$ ,  $E = 2.10 \times 105 \text{ N/mm}^2$ .

W = 15 kN

### (OR)

Derive an expression for radius of neutral axis for Trapezoidal cross section. 2 a) The section of a crane hook is a rectangle 60mm x 40mm. The center of b) 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.

### UNIT-II

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

ISKN

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

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<sup>2</sup>; Density of oil = 860 kg/m<sup>3</sup>; Specific heat of oil = 1.76 kJ/kg.<sup>0</sup>C; Using Raimondi and Boyd data given in the table, determine:

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

### (**OR**)

- What are the advantages of antifriction bearings? 4 a)
  - A single-row deep groove ball bearing is subjected to an axial thrust load 11 Marks b) 1100 N and a radial load of 2100 N. Select the suitable bearing for an average life of 5 years with 8 hr/day.

1

6 Marks 8 Marks

3 Marks

10 Marks

5 Marks



# 2

### UNIT-III

- 5 Discuss the design procedure of spur gears. a)
  - Design a spur gear drive required to transmit 45kW at a pinion speed of 7 Marks b) 800 r.p.m. The velocity ratio is 3.5: 1. The teeth are  $20^{\circ}$  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.

### (**OR**)

The following particulars of a single reduction spur gear are given: 6 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  $22.5^{\circ}$ ; 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.

number of coils. G = 80 GPa.

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

# UNIT-IV)

7 Derive the expression for the energy stored in helical springs of circular wire. 7 Marks a) A close-coiled helical spring whose free length when not compressed is 15cm, 7 Marks b) 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

### (**OR**)

- Derive the expression of the deflection of helical springs of circular wire. 8 a)
  - Design a helical compression spring for a maximum load of 1000 N for a b) 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<sup>2</sup>. TakeWahl's factor,

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

# UNIT-V

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**) 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.

> କ୍ଷ (j) (P)

7 Marks

7 Marks

14 Marks

7 Marks

10

9

(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

7 Marks

7 Marks

#### **Answer One Question from each Unit** All questions carry equal mark

# UNIT-I

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

b) Solve the solve the following LPP problem by graphical method.  $Max \ Z = 2x_1 + 3x_2$ 

 $st x_1 + x_2 \le 30,$  $x_2 \ge 3, x_2 \le 12$  $x_1 - x_2 \ge 0,$  $0 \le x_1 \le 20$ 

#### (**OR**)

2 Solve the LPP problem by Big M method:  $Max \ Z = 4x_1 + 5x_2 - 3x_3 + 50$  $st x_1 + x_2 + x_3 = 10$  $x_1 - x_2 \ge 1$  $2x_1 + 3x_2 + x_3 \le 40$   $x_i \ge 0 \forall i$ 

# UNIT-II

- 3 Outline the steps for Hungarian method. a)
  - Consider the problem in which two factories supply three stores with a b) 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:

|            | <b>F1</b> | F2 | <b>S1</b> | <b>S2</b> | <b>S3</b> |  |
|------------|-----------|----|-----------|-----------|-----------|--|
| <b>F1</b>  | 0         | 5  | 7         | 4         | 9         |  |
| F2         | 5         | 0  | 6         | 2         | 3         |  |
| <b>S1</b>  | 7         | 2  | 0         | 5         | 1         |  |
| <b>S</b> 2 | 2         | 5  | 1         | 0         | 4         |  |
|            |           |    |           |           |           |  |

4 Find the optimal solution to the following transportation problem.

|        | Destination |    |    |    |                                                                                                                  |        |  |
|--------|-------------|----|----|----|------------------------------------------------------------------------------------------------------------------|--------|--|
|        |             | Р  | Q  | R  | S                                                                                                                | supply |  |
| Origin | А           | 21 | 16 | 25 | 13                                                                                                               | 11     |  |
| Origin | В           | 17 | 18 | 14 | 23                                                                                                               | 13     |  |
|        | С           | 32 | 17 | 18 | S         supply           13         11           23         13           41         19           15         43 |        |  |
|        | demand      | 6  | 10 | 12 | 15                                                                                                               | 43     |  |

# UNIT-III )

5 (i) Distinguish between PERT and CPM. a)

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

#### (**OR**)

6 Marks

14 Marks

8 Marks

For the following data, draw the network diagram, and then crash the activities 14 Marks to find the time cost trade-off points that company should want to consider. Start with the plan that has the longest duration.

| Activity | Preceding Activity | Time (weeks) |       | <u> </u> | (Rs.) |
|----------|--------------------|--------------|-------|----------|-------|
|          |                    | Normal       | Crash | Normal   | Crash |
| Α        | -                  | 2            | 1     | 20000    | 20700 |
| В        | -                  | 3            | 1     | 29000    | 33000 |
| С        | A                  | 2            | 1     | 25000    | 26100 |
| D        | B                  | 4            | 3     | 47000    | 47750 |
| E        | С                  | 4            | 2     | 55000    | 57000 |
| F        | C                  | 3            | 2     | 29000    | 29500 |
| G        | D, E               | 5            | 3     | 79000    | 80800 |
| Н        | F,G                | 2            | 1     | 15000    | 17900 |

# UNIT-IV

- 7 a) Explain about various types of customers in queuing theory.
  - b) In a railway yard goods train arrive at a rate of 30 trains/day. Assuming that the 7 inter-arrival time follows an exponential distribution and service time distribution is also exponential with an average 36 minutes. Calculate the following:
    - 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 14 Marks the calls in case the scheduled driver reports sick. The probability distribution of sick drivers is as follows:

| 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.

9 Find the solution of the following Game

| ·A   |                | <b>B</b> <sub>1</sub> | <b>B</b> <sub>2</sub> | <b>B</b> <sub>3</sub> |  |
|------|----------------|-----------------------|-----------------------|-----------------------|--|
| yeı  | A <sub>1</sub> | 15                    | 2                     | 3                     |  |
| Pla  | $A_2$          | 6                     | 5                     | 7                     |  |
|      | A <sub>3</sub> | -7                    | 4                     | 0                     |  |
| (OR) |                |                       |                       |                       |  |

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

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14 Marks

7 Marks

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

#### HEAT TRANSFER

#### [Mechanical Engineering]

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 7 Marks elemental volume for a stationary isotropic solid.
  - b) A 3cm OD steam pipe is to be covered with two layers of insulation each having 7 Marks 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.

- 3 a) A hallow sphere 10cm ID and 30cm OD of a material having thermal 7 Marks conductivity 50 W/mK is used as s container for a liquid chemical mixture. Its inner and outer surface temperatures are 300°C and 100°C 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.
  - b) Explain the following: 7 Marks i) Efficiency of fin. ii) Effectiveness of fin. (OR)

4 a) Define lumped heat analysis.

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

### UNIT-III)

5 Air at 20°C flows over a flat plate having a uniform heat flux of 800W/m<sup>2</sup>. The 14 Marks 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.

#### (**OR**)

6 a) Air at 4 x 10<sup>-4</sup> kg/s and 27°C enters a triangular duct that is 20mm on a side and 8 Marks 2m long. The duct surface is maintained at 100°C. Assuming fully developed flow through the duct, determine air outlet temperature.

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b) Explain with neat sketch how the flow and temperature development in the 6 Marks entrance region of pipe differs among air, water and liquid metals.

Time: 3 hours

Max. Marks: 70

### UNIT-IV

- 7 a) State the different types of boiling and explain with neat sketch the different 8 Marks stages in pool boiling heat transfer.
  - b) An electric wire of 1.5mm diameter and 200mm long is laid horizontally and 6 Marks submerged in water at atmospheric pressure. The wire has an applied voltage of 16 V and carries a current of 40 amperes. Calculate:
    - i) the heat flux. ii) the excess temperature.

(**OR**)

- **8** a) Sketch the temperature variation in parallel flow and counter flow heat 5 Marks exchangers.
  - b) In a double pipe counter flow heat exchanger 10000 kg/h of an oil having a 9 Marks specific heat of 2095 J/kg K is cooled from 80°C to 50°C by 8000 kg/h of water entering at 25°C. Determine the heat exchanger area for an overall heat transfer coefficient of 300 W/m<sup>2</sup>K.

# UNIT-V

9 A truncated cone has top and bottom diameters of 20cm and 10cm respectively 14 Marks 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.

#### (OR)

| 10 | a) | Define emissivity, absorptivity and reflectivity.                            | 6 Marks |
|----|----|------------------------------------------------------------------------------|---------|
|    | b) | Two large parallel plates are kept at 1000°C and 500°C                       | 8 Marks |
|    |    | i) Determine heat radiated.                                                  |         |
|    |    | ii) If the respective emissivities are 0.7 and 0.4, determine heat radiated. |         |

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### 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)<br>b) | Derive the relationship between $\lambda g$ , $\lambda c$ and $\lambda o$ in a waveguide.<br>A rectangular waveguide with dimensions 4 x 2cms operates for the TM11 | 7 Marks<br>7 Marks |
|----|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
|    | 0)       | mode at 10GHz. Determine the characteristics wave impedance.<br>(OR)                                                                                                | ,                  |
| 2  | a)       | What is Q-factor? Derive the expression for the quality factor-Q for rectangular                                                                                    | 7 Marks            |
|    | b)       | The dimensions of a guide are $2.5$ cm x 1cm, the frequency is $8.6$ GHz. Find the following.                                                                       | 7 Marks            |
|    |          | i) Possible modes. ii) Cut-off frequency. iii) Guide wavelength.                                                                                                    |                    |
| 3  | a)<br>b) | Derive the scattering matrix of E-plane Tee.<br>With a neat diagram, explain the dielectric and rotary wave phase shifters.<br>(OR)                                 | 7 Marks<br>7 Marks |
| 4  |          | <ul><li>Write short notes on the following.</li><li>i) Directional coupler.</li><li>ii) Wave guide windows.</li><li>iii) Flap attenuator.</li></ul>                 | 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            |
| (  | a)       | (OR)                                                                                                                                                                | 7 Maria            |
| 0  | a)       | microwave frequencies                                                                                                                                               | / Warks            |
|    | 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            |
| 8  | a)       | (OR)<br>Explain the construction and working of a cylindrical magnetron                                                                                             | 7 Marks            |
| C  | b)       | Define the Hull cut-off condition. Distinguish between TWT and Magnetron.                                                                                           | 7 Marks            |
| 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            |
| 10 |          | Explain about:<br>i) IMPATT diode.<br>b) TRAPATT diode.                                                                                                             | 14 Marks           |
|    |          |                                                                                                                                                                     |                    |
|    |          | 1                                                                                                                                                                   |                    |

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

### **VLSI DESIGN**

### [Electronics and Communication Engineering]

| Time | : 3 ha   | Max                                                                                                                                                                | . Marks: 70        |
|------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
|      |          | Answer One Question from each Unit                                                                                                                                 |                    |
|      |          | An questions carry equal marks                                                                                                                                     |                    |
|      |          | UNIT-I                                                                                                                                                             |                    |
| 1    | a)<br>b) | List the main steps carried in a typical n-well process and discuss briefly.<br>Determine Zpu /Zpd for NMOS inverter driven by another inverter<br>(OR)            | 8 Marks<br>6 Marks |
| 2    | a)<br>b) | Differentiate the p-well CMOS process from n-well CMOS process.<br>Explain the n-well CMOS process to fabricate the n-switches.                                    | 7 Marks<br>7 Marks |
|      |          | UNIT-II)                                                                                                                                                           |                    |
| 3    | a)<br>b) | Drive an expression for rise time, fall time of CMOS inverter.<br>Give the stick diagram of both NMOS and CMOS inverter.<br>(OR)                                   | 6 Marks<br>8 Marks |
| 4    | a)<br>b) | Draw the stick diagram for the function $Y = (A + B + C)^{1}$ .<br>Draw the layout diagram for 2 input NOR gate.                                                   | 7 Marks<br>7 Marks |
|      |          | UNIT-III                                                                                                                                                           |                    |
| 5    | a)<br>b) | Discuss the working principle of booth multiplier with an example.<br>Explain the CMOS system design based on the data path operators with a suitable example.     | 6 Marks<br>8 Marks |
| 6    | a)<br>b) | (OR) Design a $4 \times 4$ Booth multiplier and explain its operation with suitable example. Explain the operation of parity generators with neat circuit diagram. | 8 Marks<br>6 Marks |
|      |          | (UNIT-IV)                                                                                                                                                          |                    |
| 7    | a)<br>b) | Explain the architecture of an FPGA with a neat sketch.<br>Explain CPLD with neat diagram and list out its applications.                                           | 7 Marks<br>7 Marks |
| 8    | a)<br>b) | Explain about standard cell based design.<br>PAL - 22V10 PAL architecture.                                                                                         | 7 Marks<br>7 Marks |
|      |          | UNIT-V                                                                                                                                                             |                    |
| 9    | a)<br>b) | Explain logic verification in detail.<br>What is logic synthesis? Show how VHDL support logic synthesis.                                                           | 7 Marks<br>7 Marks |
| 10   | a)<br>b) | Explain the Data path test scheme for chip level test methods.<br>Explain how controllability and observability are used to test the CMOS circuits.                | 7 Marks<br>7 Marks |
|      |          |                                                                                                                                                                    |                    |

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

# PRINCIPLES OF COMMUNICATION

### [Electronics and Instrumentation Engineering]

| Time | : 3 ho     | urs 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)                                                                                                                                    | <b>5</b> ) ( 1 |  |  |  |
| 4    | a)         | With necessary equations, explain the generation of NBFM using narrow band                                                              | / Marks        |  |  |  |
|      | h)         | FM generator.<br>Explain the comparisons between FM and AM techniques                                                                   | 7 Marks        |  |  |  |
|      | 0)         | Explain the comparisons between I with the Pilvi techniques.                                                                            | / IVIUINS      |  |  |  |
|      |            | (UNIT-III)                                                                                                                              |                |  |  |  |
| 5    | a)         | Explain the differences between DM and ADM.                                                                                             | 7 Marks        |  |  |  |
|      | b)         | Explain the block diagram of FDM system.                                                                                                | 7 Marks        |  |  |  |
|      | ``         | (OR)                                                                                                                                    | 7 ) ( 1        |  |  |  |
| 6    | a)<br>b)   | Compare IDM and FDM.                                                                                                                    | 7 Marks        |  |  |  |
|      | 0)         | Explain the natural and nat tap sampling techniques.                                                                                    | / IVIAIKS      |  |  |  |
| _    |            | UNIT-IV                                                                                                                                 |                |  |  |  |
| 7    | a)         | Explain about PSK, QPSK.                                                                                                                | 7 Marks        |  |  |  |
|      | b)         | Explain the working of Coherent and non coherent PSK.                                                                                   | / Marks        |  |  |  |
| 8    | a)         | A bit stream 1011111011 is to be transmitted using ASK FSK and PSK                                                                      | 7 Marks        |  |  |  |
| 0    | u)         | techniques. Draw the waveforms for the above mentioned digital modulation                                                               |                |  |  |  |
|      | <b>b</b> ) | techniques.                                                                                                                             | 7 Mortra       |  |  |  |
|      | 0)         | using ADM.                                                                                                                              | / WAIKS        |  |  |  |
|      | 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        |  |  |  |
| 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        |  |  |  |
|      | ,          |                                                                                                                                         |                |  |  |  |

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#### 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 | Max. Marks: 70 |                                                                                                           |     |          |
|------|----------------|-----------------------------------------------------------------------------------------------------------|-----|----------|
|      |                |                                                                                                           |     |          |
| 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:                                                                                    | CO1 | 14 Marks |
|      |                | i) Fixed costs <i>Vs.</i> Variable costs.                                                                 |     |          |
|      |                | ii) Separable Costs Vs. Joint costs.                                                                      |     |          |
|      |                | iii) Avoidable Costs Vs. Unavoidable costs.                                                               |     |          |
|      |                | (OR)                                                                                                      |     |          |
| 4.   |                | From the following particulars calculate the Break-Even Point in terms of both quantity and value:        | CO2 | 14 Marks |
|      |                | Production in units : 20,000                                                                              |     |          |
|      |                | Sales price : Rs.6/- per unit                                                                             |     |          |
|      |                | Variable costs : Rs.40,000/-                                                                              |     |          |
|      |                | Fixed costs : Rs.24,000/-                                                                                 |     |          |
|      |                | UNIT-III                                                                                                  |     |          |
| 5.   |                | What is Perfect Competition? Explain its features in detail.                                              | CO4 | 14 Marks |
|      |                | (OR)                                                                                                      |     |          |
| 6.   |                | Explain the following:                                                                                    | CO3 | 14 Marks |
|      |                | i) Marginal cost pricing. ii) Cost plus pricing.                                                          |     |          |
|      |                | iii) Skimming pricing. iv) Peak load pricing.                                                             |     |          |
|      |                | 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 |

| 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     |

10. The following is the Trial Balance as on 31-03-2018. Prepare Trading and CO4 14 Marks Profit and Loss Account and Balance Sheet

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.

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### 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. I          | Max. Marks: 70   |                 |                 |               |        |         |        |                     |
|---------------|----------|---------------------------------------|---------|----------|-------------------|-----------------|------------------|-----------------|-----------------|---------------|--------|---------|--------|---------------------|
|               |          |                                       |         | Ans<br>A | swer ()<br>All qu | One Q<br>estion | uestio<br>s carr | n fror<br>y equ | n each<br>al ma | n Unit<br>rks |        |         |        |                     |
|               |          |                                       |         |          |                   | $\square$       | UNIT             | - <b>I</b> )    |                 |               |        |         |        |                     |
| 1             | a)       | Explain the fi                        | inctio  | ns of N  | Janao             | ement           |                  |                 |                 |               |        |         | CO1    | 7 Marks             |
| 1.            | u)<br>b) | Define Organ                          | izatio  | n Wri    | ta tha            | object          |                  | ad priv         | ncinla          | a of Or       | raaniz | ation   | CO1    | 7 Marks             |
|               | 0)       |                                       | 124110  | u. vv11  |                   | object          |                  | na prin         | licipics        | 5 01 01       | gamz   | ation.  | 001    | / 10 <b>10</b> 1110 |
| 2             | a)       | Write the nati                        | ire an  | dimno    | ortance           | e of M          | anager           | )<br>ment       |                 |               |        |         | CO3    | 7 Marks             |
|               | h)       | What is Line                          | Organ   | u mpo    | n9 Wr             | ite the         | henef            | ite of          | line O          | rogniz        | ation  |         | CO3    | 7 Marks             |
|               | 0)       | what is Line                          | Organ   | lizatio  | LI: VVI.          |                 |                  |                 |                 | Igamz         | ation. |         | 005    | , 1,141115          |
| 3             | a)       | Dofino Marko                          | ting?   | Writa    | functi            |                 | Morle            | oting           |                 |               |        |         | $CO^2$ | 7 Marks             |
| 5.            | u)<br>h) | Explain the cl                        |         | u mod    | al of E           |                 | IVIAIK           | eting.          |                 |               |        |         | CO2    | 7 Marks             |
|               | 0)       | Explain the classical model of E.O.Q. |         |          |                   |                 |                  |                 |                 |               | 002    | / WINKS |        |                     |
| 4.            | a)       | Write short no                        | ntes of | n.       |                   |                 |                  | ,               |                 |               |        |         | CO1    | 4 Marks             |
|               | )        | i) Just                               | in Ti   | ne.      | ii                | ) Worl          | k study          | 1.              |                 |               |        |         |        |                     |
|               | b)       | The data g                            | iven    | below    | sho               | ws tł           | ne de            | tails           | for t           | he in         | specti | on of   | CO4    | 10 Marks            |
|               |          | 10 consecutiv                         | e batc  | hes:     |                   | -               |                  |                 |                 |               | 1      |         |        |                     |
|               |          | Batch No.                             | 1       | 2        | 3                 | 4               | 5                | 6               | 7               | 8             | 9      | 10      |        |                     |
|               |          | No. of                                | 175     | 101      | 200               | 166             | 017              | 1.50            | 100             | 220           | 1.0    | 212     |        |                     |
|               |          | pieces<br>inspected                   | 1/5     | 181      | 208               | 166             | 217              | 158             | 199             | 220           | 162    | 212     |        |                     |
|               |          | No. of                                | 5       | 10       | 7                 | 4               | 0                | (               | 7               | 5             | 2      | 5       |        |                     |
|               |          | defectives                            | 5       | 10       | /                 | 4               | 8                | 0               | /               | 3             | 3      | 5       |        |                     |
|               |          | Construct a cl                        | nart sh | nowing   | g the c           | ontrol          | and w            | arning          | g limit         | s.            |        |         |        |                     |
|               |          |                                       |         |          |                   | (U              | NIT-             | III)            |                 |               |        |         |        |                     |
| 5.            | a)       | Write the role                        | of H.   | R mar    | nager i           | n an C          | Organiz          | zation          |                 |               |        |         | CO1    | 7 Marks             |
|               | b)       | Explain Herz<br>examples.             | zberg'  | s two    | o fact            | or th           | eory             | of m            | otivati         | on w          | rith s | uitable | CO1    | 7 Marks             |
|               |          |                                       |         |          |                   |                 | (OR              | )               |                 |               |        |         |        |                     |
| 6.            | a)       | Briefly explai                        | n the   | nature   | and so            | cope c          | of H.R.          | M.              |                 |               |        |         | CO1    | 7 Marks             |
|               | b)       | Define Job Ev                         | valuati | ion. Ez  | xplain            | the in          | nportar          | nce of          | Job E           | valuat        | ion.   |         | CO1    | 7 Marks             |
|               |          |                                       |         |          |                   | Ū               | NIT-             | ·IV)            |                 |               |        |         |        |                     |
| 7.            | a)       | Discuss the ro                        | ole of  | wome     | n in ar           | n Entre         | eprene           | urship          |                 |               |        |         | CO5    | 7 Marks             |
|               | b)       | Write the diff                        | erence  | es betv  | veen E            | Entrep          | reneur           | and N           | lanage          | er.           |        |         | CO5    | 7 Marks             |
|               |          |                                       |         |          |                   |                 | (OR              | )               |                 |               |        |         |        |                     |
|               |          |                                       |         |          |                   |                 |                  |                 |                 |               |        |         |        |                     |

| Activity | Dradaaagaar | Time estimate |             |             |  |  |  |  |
|----------|-------------|---------------|-------------|-------------|--|--|--|--|
| Activity | Predecessor | Optimistic    | Most likely | Pessimistic |  |  |  |  |
| Α        | -           | 4             | 6           | 8           |  |  |  |  |
| В        | А           | 5             | 7           | 15          |  |  |  |  |
| C        | А           | 4             | 8           | 12          |  |  |  |  |
| D        | В           | 15            | 20          | 25          |  |  |  |  |
| Е        | В           | 10            | 18          | 26          |  |  |  |  |
| F        | С           | 8             | 9           | 16          |  |  |  |  |
| G        | Е           | 4             | 8           | 12          |  |  |  |  |
| Н        | D,F         | 1             | 2           | 3           |  |  |  |  |
| Ι        | G,H         | 6             | 7           | 8           |  |  |  |  |

8. The activity details along with time estimates in days and precedence CO4 14 Marks relationships are given below:

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  | CO2 | 7 Marks |
|     |    | Globalisation.                                                |     |         |
|     |    | (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 |
|     |    |                                                               |     |         |

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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 Ouestion 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. 14 Marks CO<sub>2</sub> (**OR**) Explain about the Business models of B2B and B2C with examples. 6. CO2 14 Marks UNIT-IV Write and describe the elements of insurance. 7. CO3 14 Marks (**OR**) "Insurance as a risk mitigating mechanism". Explain. 8. CO3 14 Marks UNIT-V 9. Differentiate LIC and GIC with examples. CO1 14 Marks (**OR**) 10. Write about Insurance Players in India. 14 Marks CO4

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Time: 3 hours

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]

### 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  |
|     |    |                                                                                                  |     |          |

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Max. Marks: 70

SVEC-16
(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

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

Max. Marks: 70

## UNIT-I )

1. "Success is a peak and cannot be reached in a leap". Discuss the CO1 14 Marks implications of the above statement.

#### (**OR**)

 a) Self-confidence is both a cause and consequence of Self-esteem. Explain. CO1 7 Marks
 b) Loyalty vs Self-esteem : a case study Lauren's first job after graduation from Santa Clara University was

working as a quality engineer with a highly respected technology company. She had to monitor the manufacturing process and make sure that all products met customer specifications. Just three months into her position, the company booked a very large deal with a strategic customer, helping establish the company's dominance in the industry.

Specifically, Lauren's company was designing a device that would be integrated into another company's product. The customer contracted out this work because they were experiencing rapid growth and cannot meet demand otherwise. They picked Lauren's company because of its good reputation and fast turnaround time. Lauren's role was to test the new device and make sure it met technical and environmental specifications, particularly functionality under extreme conditions, such as high humidity.

The test results showed that the products did not meet the quality standards agreed upon, but only by a very small margin. Her general manager instructed her to push it through anyway, stating that the risk of failure was not great enough to delay mass production. Moreover, the likelihood of the product ever being placed in such extreme situations was so small that the manager did not feel jeopardizing the contract was worth it.

Lauren spoke to her immediate boss, who worked under her general manager, and he also advocated pushing the product through to production. She was faced with the choice of ignoring company protocols or going against management. Sweeping the problem under the rug would require Lauren to sign off on a report that she knew to be fraudulent. She also knew that if she went to upper management her working relationships with her immediate bosses would be strained, maybe even preventing her success in the company. Not to mention, the company would have to delay production and possibly lose the contract. What should Lauren do?

|     |    | 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<br>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. <b>(OR)</b>                                                               | CO1 | 14 Marks |
| 8.  | a) | "A leader is one who knows the way, goes the way, and shows the way"<br>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  |
| 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  |

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#### 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              |
|     |            |                                                                                                                                           |          |                      |
| 3   | a)         | Explain "for" statement in python with an example                                                                                         | CO1      | 7 Marks              |
| 5.  | 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                                                                  | CO3      | 10 Marks             |
|     | <b>b</b> ) | Further the concernt of using toys files in detail with an relevant examples                                                              | cor      | 1 Mortes             |
|     | D)         | Explain the concept of using text files in detail with an relevant examples.                                                              | 02       | 4 Marks              |
| 6   | a)         | (UK)<br>Illustrate with a program, the concept of Cigorotte Use/Lung Concer-                                                              | CO4      | 0 Mortra             |
| 0.  | a)         | Correlation program with justification.                                                                                                   | 004      | 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                                                                  | CO5      | 7 Marks              |
|     |            | (OB)                                                                                                                                      |          |                      |
| 8   |            | Illustrate the concept of Inheritance in detail? Explain the types of                                                                     | CO5      | 14 Marks             |
| 0.  |            | Inheritance with respective examples in python programming                                                                                | 005      | I I IVIUINS          |
|     |            |                                                                                                                                           |          |                      |
| 0   | -)         | Emploin in detail the Dividing second                                                                                                     | CO1      | 7 ) (                |
| 9.  | a)<br>b)   | Explain in detail the Binding events.                                                                                                     | CO1      | 7 Marks              |
|     | 0)         | Describe the usage of Tkinter extensions and structures.                                                                                  | 002      | / WIAIKS             |
| 10  | <i>a)</i>  | (UK)<br>Write a short note on Tkinter coding alternatives in detail                                                                       | CO1      | 7 Marka              |
| 10. | a)<br>b)   | Develop a reusable GUI component with classes like dialogs check                                                                          | $CO_{1}$ | 7 IviaiKS<br>7 Marks |
|     | UJ         | buttons and radio buttons.                                                                                                                | COS      | / 1 <b>VIALKS</b>    |

Time: 3 hours

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(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]

Max. Marks: 70

Answer One Question from each Unit All questions carry equal marks

#### (UNIT-I)

|     |    |                                                                                                            | 994 |         |
|-----|----|------------------------------------------------------------------------------------------------------------|-----|---------|
| 1.  | a) | Illustrate the Data Models in detail.                                                                      | COI | 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 |
|     |    |                                                                                                            |     |         |

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CODE No.: 16BT41202

Time: 3 hours

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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

## JAVA PROGRAMMING

# [ Mechanical Engineering ]

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          | CO3 | 9 Marks |  |
|     |        | constructors in multi level inheritance with a java code.                    |     |         |  |
|     | 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 |  |

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SVEC-16

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

Roll No.

## 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  |
|     |    |                                                                                                                                                           |             |          |
| 3.  | a) | Explain Dynamic characteristics of transducer and their effect on performance of transducer.                                                              | CO1,<br>CO3 | 7 Marks  |
|     | b) | Explain the components of hydraulic activation system with neat sketch<br>and block diagram. Distinguish between Servo valve and Direct Control<br>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,<br>CO6 | 14 Marks |
|     |    | (OR)                                                                                                                                                      |             |          |
| 10. |    | Device a pick and place robot system explain the various Mechatronics elements used in the design.                                                        | CO5         | 14 Marks |

Time: 3 hours

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## SREE VIDYANIKETHAN ENGINEERING COLLEGE

Roll No.

(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]

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 |
|----|----|-------------------------------------------------------------------------------------------------------------------------------------------------|-----|----------|
| 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  |
| 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, 011110111110111110, 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:<br>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:

E

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 CO2 14 Marks header that is missing from UDP header. Give the reason for their absence.

#### (OR)

- 8. a) How is congestion controlled? Explain in detail about congestion control CO3 8 Marks techniques in transport layer.
  - b) What is meant by data encapsulation? Explain data encapsulation in CO3 6 Marks TCP/IP.

## 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 CO3 7 Marks
b) Explain in detail about HTTP. CO3 7 Marks

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Time: 3 hours

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]

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                                                                                                                                      | CO1 | 7 Marks            |
|-----|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------------|
|     | b) | Explain how basic and nested tables are created using HTML.                                                                                                                                              | CO2 | 7 Marks            |
| 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            |
| 3   | a) | Explain different types of control statements in Java script with example                                                                                                                                | CO5 | 7 Marks            |
| 5.  | b) | Define CSS. Explain inline, internal, external and embedded style sheets with examples.                                                                                                                  | CO3 | 7 Marks<br>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<br>Indian rupees through input dialog and select foreign currency to which<br>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            |
|     |    |                                                                                                                                                                                                          |     |                    |
| 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. (OR)                                                                                                                           | CO3 | 7 Marks            |
| 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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#### 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 How to create a two dimensional array in Java? Write a program to print 1. a) CO1 5 Marks unit matrix of size 5x5. What is meant by parameterized constructor? Explain with an example. CO1 9 Marks b) (**OR**) 2. Illustrate how methods are overloaded in Java with an example. CO3 7 Marks a) List any five methods of string class with its syntax and example on each CO1 7 Marks b) of it. UNIT-II ) Differentiate between this and super keyword in Java. CO3 8 Marks 3. a) b) What is an abstract class? Write an example how abstract classes are CO2 6 Marks created and accessed. (**OR**) 4. Why java does not support multiple inheritances? How to solve this CO3. 8 Marks a) problem? CO6 Elaborate the process of creating a user defined package. CO3 6 Marks b) (UNIT-III) 5. Illustrate the need of finally keyword in programming languages. a) CO1 6 Marks Discuss about how a user defined exception is created in Java. b) CO1, 8 Marks CO<sub>2</sub> (OR)Describe how priorities will be used in invoking multiple threads created 6. CO1 7 Marks a) through Runnable interface. Sketch the life cycle of a Thread and discuss about each of its state. b) CO1, 7 Marks CO2 UNIT-IV ) 7. What is the need of Collection Classes in Java? Discuss about LinkedList CO<sub>2</sub> 6 Marks a) class with an example. Illustrate how TreeSet will be used in Collections with an example. CO4 8 Marks b) (OR)8. How do you pass parameters to an Applet in Java? CO4 7 Marks a) Discuss about various layout managers available in AWT. CO4 7 Marks b) UNIT-V With an example, discuss how MouseListener interface is implemented. 9. a) CO4 8 Marks Elaborate the need of delegation event model of Java Language. CO4 6 Marks b) (**OR**) 10. Create a Servlet to read Login Credentials of a user and display that CO6 9 Marks a) information in it. Discuss about life cycle of a Servlet with its skeleton. CO5, 5 Marks b) CO6

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

## FOUNDATION ENGINEERING

#### [Civil Engineering]

Time: 3 hours

Max. Marks: 70

CO<sub>2</sub>

6 Marks

## **Answer One Question from each Unit** All questions carry equal marks

## UNIT-I

- 1. Discuss in brief about various methods of boring. CO1 8 Marks a) Explain about Seismic refraction method with an aid of neat sketch. CO1 6 Marks b) (**OR**) 2. With an aid of neat sketch, discuss about static cone penetration test. Give CO1 7 Marks a) out correlations between cone resistance  $(q_c)$  and SPT number (N). Explain in brief about various design features effecting sample CO1 7 Marks b) disturbance. UNIT-II 3. Differentiate between Rankine's earth pressure theory and Coulomb's CO1 a) 8 Marks earth pressure theory. A retaining wall of height 7m retains a backfill with horizontal surface. CO2 6 Marks b) The backfill was having  $\phi = 30^{\circ}$ ,  $\gamma_{sat} = 21 \text{kN/m}^3$  and  $\gamma = 17 \text{ kN/m}^3$ . The water table is at a depth of 4m from backfill surface. Calculate the total passive earth pressure acting on retaining wall. (OR)4. Explain in brief about stability considerations of gravity retaining wall CO1 7 Marks a) with a neat sketch. A retaining wall with a smooth vertical back, retains a clayey backfill CO<sub>2</sub> 7 Marks b) with  $c = 17 \text{ kN/m}^2$ ,  $\phi = 27^\circ$ ,  $\gamma = 20 \text{ kN/m}^3$ . Calculate the total active thrust
  - acting on retaining wall assuming that tension crack may develop to the full theoretical depth.

## UNIT-III)

- 5. What are the various types of slope failure? Explain them briefly. a)
  - CO<sub>2</sub> 8 Marks b) An infinite slope in sandy soil is inclined at 20° to the horizontal has  $\gamma = 18 \text{ kN/m}^3$ ,  $\gamma_{\text{sat}} = 21 \text{ kN/m}^3$ ,  $\phi = 35^\circ$ . 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?

### (**OR**)

- Explain the stability analysis for finite slopes using Bishop's method. CO2 6. 8 Marks a)
  - **b**) An embankment constructed with an inclination of 35<sup>°</sup> and its height is CO2 6 Marks 15m. The angle of shearing resistance is 15<sup>0</sup>, cohesion intercept is 20 kN/m<sup>2</sup> and unit weight of soil is 18.0 kN/m<sup>3</sup>. If the embankment was fully submerged, then find the factor of safety with respect to cohesion. Use Taylors stability number.

For  $i = 35^{\circ}$  and  $\phi = 15^{\circ}$ , take Sn = 0.06.

## UNIT-IV

- 7. a) Discuss about the effect of water table on bearing capacities of shallow CO1 8 Marks foundation.
  - b) Determine the allowable bearing pressure of a shallow foundation of 2m CO2 6 Marks 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.

### (OR)

- 8. a) What are the assumptions of Terzaghi's bearing capacity theory? CO1 6 Marks
  - b) A square footing of size  $3m \times 3m$  rests on a c-  $\phi$  soil having c =  $12kN/m^2$ , CO2 8 Marks  $\phi = 30^{\circ}$  and  $\gamma = 18 kN/m^3$ . 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  $\phi = 30^{\circ}$ , N<sub>c</sub> = 37.2, N<sub>q</sub> = 22.5 and N<sub>y</sub> = 19.7) Take F.S = 3.

## UNIT-V

- 9. a) What is a pile foundation? What are the conditions where a pile CO1 8 Marks foundation is more suitable than a shallow foundation?
  - b) Discuss in brief about various formulae used for determining capacity of CO1 6 Marks driven piles.

#### (OR)

- 10. a) Explain the following rectifying methods of tilts and shifts of well CO1 6 Marks foundation.
  - i) Controlled dredging.
  - ii) Pushing the well.
  - iii) Water jetting.
  - b) What are the various types of caissons? Give out their advantages and CO1 8 Marks disadvantages.

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

# HIGHWAY AND TRAFFIC ENGINEERING

## [Civil Engineering]

Max. Marks: 70

#### **Answer One Ouestion from each Unit** All questions carry equal marks

## UNIT-I

| 1. | a) | Explain briefly the following.                                                                             | CO1 | 6 Marks |
|----|----|------------------------------------------------------------------------------------------------------------|-----|---------|
|    |    | i) IRC.                                                                                                    |     |         |
|    |    | ii) Central Road Fund.                                                                                     |     |         |
|    | 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 vehicle travelling with a speed of 45 kmph was stopped within CO4 6 Marks a) 1.7 seconds after application of brakes. Find the average skid resistance.
  - Discuss fundamental diagrams of traffic flow. CO6 8 Marks b)

Time: 3 hours

## UNIT-IV

- 7. a) Enlist method of traffic volume study and explain mechanical counters CO6 7 Marks method with advantages.
  - 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 CO7 7 Marks and operational delay.

b) Define practical capacity. Briefly discuss various factor affecting the CO7 7 Marks practical capacity of road

### UNIT-V

- 9. a) Explain collision and condition diagram. List preventive measure for road CO6 7 Marks accidents.
  - 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 CO7 7 Marks and explain about them in brief.
  - b) List various traffic signs as per IRC and draw neat sketch of following CO7 7 Marks signs.

i) No parking. ii) Hair pin Band. iii) Give way.

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Time: 3 hours

### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### STEEL STRUCTURES [Civil Engineering]

Max. Marks: 70

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

## UNIT-I

 Design a double cover plate butt joint using M24 bolts of product grade C CO3 14 Marks 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.

#### (OR)

2. Determine the size of end fillets to connect two plates with cross sections CO2 14 Marks 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,  $f_u = 410$  MPa.

## UNIT-II)

 Design a laterally unsupported beam for the following data: CO3 14 Marks Effective span: 4 m; Maximum bending moment: 550 kNm; Maximum shear force: 200 kN; Steel of grade: Fe 410.

#### (OR)

4. Design a simply supported beam of span 5m carrying a reinforced CO3 14 Marks concrete floor capable of providing lateral restraint to the top compression flange. The uniform distributed load of 60kN/m. Assume Fe 410 grade steel.

## UNIT-III)

5. Determine the tension capacity of 150 x 90 x 8mm angles in Fe 410 steel CO2 14 Marks 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.

### (OR)

6. A double angle discontinuous strut consists of two ISA 75 x 75 x 6 CO3 14 Marks 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.

## UNIT-IV

7. Design a batten system for a column of 10m long to carry a factored axial CO4 14 Marks load of 1000kN. The column is restrained in position but not in direction at both ends. Assume that the two channels back to back.

### (OR)

#### 1

8. Design a suitable slab base for a column section ISHB 200 at 365.9 N/m CO2 14 Marks supporting an axial load of 400kN. The base plate is to rest on a concrete pedestal of M-20 grade.

## UNIT-V

9. As per IS 875 (Part 3), determine the basic wind pressure to be considered CO6 14 Marks 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.

#### (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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Time: 3 hours

Roll No.

### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

# FIRE ENGINEEERING

[Civil Engineering]

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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(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

## ADVANCED STRUCTURAL ANALYSIS

## [Civil Engineering]

Max. Marks: 70

CO1

7 Marks

Time: 3 hours

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. CO2
  - ii) Rib shortening and temperature changes in the arches.
  - b) Find the horizontal thrust of a two hinged arch subjected to concentrated CO4 7 Marks load as shown below.



(**OR**)

2. A three hinged parabolic arch is shown in figure, determine the bending CO2 14 Marks moment, normal thrust and radial shear at quarter span and draw bending CO4 moment.



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



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



1

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

CO3 14 Marks



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



7. Analyse the given continuous beam by stiffness matrix method and CO2 14 Marks sketch BMD.



(OR)

8. Calculate the support moments for the given continuous beam by support CO3 14 Marks B sinks by 2.5mm. Draw BMD. Take E=200kN/mm<sup>2</sup>, I=3.5x10<sup>7</sup> mm<sup>4</sup>



9. A curved beam is in the form of a full continuous circle in plan with a CO2 14 Marks 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.

### (OR)

10. A semi-circular beam is simply supported on three equally spaced CO2 14 Marks columns. Show that the maximum bending moment and maximum twisting moment are equal to 0.429wR<sup>2</sup> and 0.1045wR<sup>2</sup> respectively.

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(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

## **GROUNDWATER DEVELOPMENT AND MANAGEMENT**

[Civil Engineering]

Time: 3 hours

Max. Marks: 70

#### **Answer One Question from each Unit** All questions carry equal marks

## ( UNIT-I )

| 1. | a) | Define Darcy law. Derive the expression for the Darcy law. List the | CO1 | 8 Marks |
|----|----|---------------------------------------------------------------------|-----|---------|
|    |    | different assumptions and discuss it validity.                      |     |         |
|    | b) | Briefly explain Aquifer, Aquiclude, Aquitard and Aquifuge.          | CO1 | 6 Marks |

#### (**OR**)

- 2. Discuss the terms specific yield, specific retention, porosity and their CO1 8 Marks a) relationship.
  - With the help of neat sketch, explain in detail the vertical distribution of CO1 6 Marks b) ground water.

## UNIT-II

- Derive the expression for discharge "Q" through a well, fully penetrating 3. a) CO<sub>2</sub> 8 Marks a confined aquifer or artesian aquifer.
  - An unconfined aguifer has a thickness of 40m. A fully penetrating 20cm b) CO2 6 Marks 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.

#### (**OR**)

- Derive an expression for discharge from a well fully penetrating a CO2 4. 7 Marks a) unconfined aquifer under steady state flow. Assume if any data required.
  - An unconfined aquifer has a thickness of 30m. A fully penetrating 20cm CO2 7 Marks b) 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.

## UNIT-III

| 5. | a) | Briefly discuss saline water intrusion. List the different reason for the | CO4 | 8 Marks |
|----|----|---------------------------------------------------------------------------|-----|---------|
|    |    | saline water intrusion.                                                   |     |         |
|    | b) | List the different disadvantages of saline water intrusion in aquifers.   | CO4 | 6 Marks |
|    |    | (OR)                                                                      |     |         |
| 6  | a) | Explain Glover method                                                     | CO4 | 5 Marks |

Explain Glover method. CO<sub>4</sub> a) b) A well screen 1m in length is located 15m below the groundwater table in CO6 9 Marks 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?

5 Marks

## UNIT-IV

7. List and briefly explain different techniques used for ground water CO3 14 Marks recharge methods in detail with neat sketches.

#### (OR)

- 8. a) List and explain the indirect techniques used of the ground water CO3 7 Marks recharge.
  - b) Describe any one combined techniques of subsurface and surface used for CO3 7 Marks recharge of ground water.

## UNIT-V

9. Briefly discuss geophysical logging and resistivity logging sub-surface CO5 14 Marks methods of ground water investigation.

#### (OR)

- 10. a) Explain the principle of subsurface investigation using electrical CO5 8 Marks resistivity methods for exploration of ground water.
  - b) Explain the basic principle of seismic refraction method. CO5 6 Marks

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Max. Marks: 70

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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

#### SOLID WASTE MANAGEMENT [Civil Engineering]

Time: 3 hours

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 CO2 7 Marks the average moisture content of the sample. Base your calculations on a100kg sample size.

| 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 CO2 14 Marks Solid Waste Management.

### (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 CO5 7 Marks containers.

#### (OR)

4. How the recyclable materials are separate at source? Discuss briefly CO2 14 Marks processing of solid waste at residential dwellings.

## (UNIT-III)

- 5. a) Investigate the important factors to be considered in preparation of CO4 7 Marks collection routes.
  - b) Explain the different options available for collection of waste under CO2 7 Marks Indian condition.

#### (**OR**)

6. Explain in detail about selection of location, operation and maintenance CO9 14 Marks of transfer station.

## UNIT-IV

7. a) Write a detailed note on "composting". CO5 7 Marks
b) What is incineration? Explain the advantages and disadvantages of CO2 7 Marks incineration of refuse.

## (OR)

8. Explain in detail about any two techniques used for processing of solid CO5 14 Marks waste.

## 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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#### 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

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

## UNIT-I

| 1.  | a)<br>b)  | Write about Rural Indian life and Indian farmer.<br>Explain how the technology plays a vital role in improving rural infrastructure. | CO2<br>CO1 | 7 Marks<br>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                                                               | CO4        | 7 Marks            |
| 5.  | u)<br>1 ) | with merits and de-merits.                                                                                                           | 004        |                    |
|     | 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<br>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            |
| 0.  | h)        | Write the procedure for processing of economic plants                                                                                | CO4        | 7 Marks            |
|     | 0)        | UNIT-IV                                                                                                                              | 001        |                    |
| 7.  | a)        | The village which is located in a drought prone area, suggest how rain<br>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            |
|     | ,         |                                                                                                                                      |            |                    |
| 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            |
| 10  |           | (UK)                                                                                                                                 | $CO^{2}$   | 7 Manles           |
| 10. | a)<br>b)  | Discuss the impact of 11 in fural development.                                                                                       | $CO_3$     | 7 Marks            |
|     | U)        | A A A                                                                                                                                | $CO_2$     | / IVIAIKS          |
|     |           | <u> </u>                                                                                                                             |            |                    |

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Max. Marks: 70

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

#### **POWER SEMICONDUCTOR DRIVES** [Electrical and Electronics Engineering]

Max. Marks: 70

Answer One Question from each Unit All questions carry equal marks

## 

| 1. | a) | Derive the fundamental torque equation of an electrical drive.                                                                                                                                      | CO1 | 8 Marks |
|----|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------|
|    | b) | A drive has the following parameters:                                                                                                                                                               | CO1 | 6 Marks |
|    |    | T = 150 - 0.1 N, N-m, where N is the speed in r.p.m.                                                                                                                                                |     |         |
|    |    | Load torque $TI = 100$ , N-m, Initially the drive operating in steady-state.<br>The characteristics of the load torque are changed to $TI = -100$ . Calculate initial and final equilibrium speeds. |     |         |
|    |    | (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

A 230V, 960 r.p.m, 20A separately excited dc motor has armature CO3 14 Marks 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) α =60<sup>o</sup> and torque =1000 N-m. (ii) α =120<sup>o</sup> and torque =1000 N-m.

#### (OR)

4. Analyze speed torque relation and characteristics of separately excited CO2 14 Marks DC motor fed by a 3-phase fully controlled converter. Draw the relevant waveforms.

## UNIT-III)

5. Describe operation of chopper fed to separately excited DC motor under CO2 14 Marks motoring and regenerative braking control with circuit and waveforms.

### (OR)

- 6. A 230 V, 1200 r.p.m, 15 A separately excited motor has an armature CO4 14 Marks resistance of  $1.2\Omega$ . Motor is operated under dynamic braking with chopper control; braking resistance has a value of  $20\Omega$ .
  - 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.

Time: 3 hours

## UNIT-IV

- 7. a) With necessary block diagram, explain operation of variable frequency CO2 10 Marks control of 3-phase Induction motor.
  - 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 CO5 14 Marks 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°. DC link inductor resistance is 0.01 Ω.
  Calculate:

  i) Transformer turns ratio.
  ii) Torque for a speed of 780 r.p.m at α=140°
  - iii) Firing angle for half the rated motor torque and speed of 800 r.p.m.

## UNIT-V

- 9. a) Analyze the operation of self-controlled synchronous motor with Voltage CO2 10 Marks source inverter.
  - b) Name the different modes employed to achieve variable frequency control CO1 4 Marks in synchronous motors.

### (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 CO5 10 Marks load torque capability how drive circuit selected.

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

## **POWER SYSTEM ANALYSIS**

#### [Electrical and Electronics Engineering]

Max. Marks: 70

Time: 3 hours

## **Answer One Question from each Unit** All questions carry equal marks

## UNIT-I

Form Y bus for the network by direct inspection method: 1. CO4 7 Marks a) Element 5-2 1-2 2 - 35-1 1 - 43-6 4-6 Positive 0.04 0.04 0.02 0.07 sequence 0.05 0.03 0.10 reactance Define the per unit value of a quantity. How will you change the base b) CO1 7 Marks impedance from one set of base values to another set?

(**OR**)

- 2. Describe the per phase generator model with required diagrams. 7 Marks CO<sub>2</sub> a) b) 7 Marks
  - With neat diagrams, explain the transformer model used for per phase CO2 analysis.

- 3. Illustrate the modifications necessary in the  $Z_{BUS}$  when a mutually coupled CO5 7 Marks a) element is removed.
  - Using the building algorithm construct  $Z_{BUS}$  for the system shown in figure. CO4 7 Marks b) Choose 4 as reference bus.



- 4. Explain the procedure for modification of  $Z_{BUS}$  when a line is added, which 7 Marks a) CO5 has no mutual reactance.
  - Form bus impedance matrix for the data given below. b)

Bus code Element number Self-impedance From bus - To bus 1 2-3 0.6 p.u. 2 1-3 0.5 p.u. 3 1 - 20.4 p.u.

1

CO3 7 Marks

## UNIT-III)

5. Explain the step by step computational procedure for the Gauss-Seidel CO5 14 Marks method of load flow studies when the system contains all types of buses.

#### (OR)

- 6. a) What are the assumptions made in reducing Newton Raphson method to CO1 7 Marks decoupled method for power flow solution?
  - 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 CO2 7 Marks be analysed using  $Z_{BUS}$ .
  - b) What are the various types of faults? Discuss their frequency of occurrence CO3 7 Marks and severity. Find the fault current when an L-L-G fault occurs at the terminals of an unloaded generator.

#### (OR)

- 8. a) Illustrate the procedure for making short circuit studies of a large power CO1 7 Marks system.
  - b) A 3-phase, 25 MVA, 11 KV alternator has internal reactance of 6%. Find CO3 7 Marks 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.

## 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 CO4 7 Marks stability?

#### (**OR**)

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 CO5 7 Marks state stability.

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#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

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### 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 $20 \times 8 \times 5$ meters. The following are to be points to be fitted and draw the layout of the given system.  | CO3,<br>CO4,<br>CO7 | 14 Marks |
|----|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------|
|    |    | <ul> <li>i) Lights points - 8 Nos x 20W</li> <li>ii) Fan Points - 6 Nos x 60W</li> <li>iii) Plug Points - 3 point socket type - 3 x 100W</li> </ul>                                                                               |                     |          |
|    |    | iv) AC - 2 x 1.5 Ton (appox. rating assume 2kW).                                                                                                                                                                                  |                     |          |
| ~  | `` |                                                                                                                                                                                                                                   | 001                 | 7 ) ( 1  |
| 2. | a) | write the general rules to be considered for wiring systems and also<br>explain the estimation of Conductor size and selection cables for a<br>particular load (Assume necessary data for explanation)                            | CO1,<br>CO3         | / Marks  |
|    | b) | Explain tin brief different types of domestic and commercial wiring systems. List out all merits and demerits.                                                                                                                    | CO1,<br>CO3         | 7 Marks  |
|    |    | UNIT-II)                                                                                                                                                                                                                          |                     |          |
| 3. | a) | An overhead 3-phase, 415V distributor to be laid along route 450m long.<br>The end supports are terminal poles with 60m span in between. Prepare<br>list for laying distributor. Consider the following data:                     | CO1,<br>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 <sup>2</sup> , 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<br>located 10 mts away from the pole, with following loads:<br>i) Lighting and other loads = 2.5 kW,                                                      | CO1,<br>CO3         | 7 Marks  |
|    |    | ii) AC Load: 10kW (Assume safety factor = 1.66)                                                                                                                                                                                   |                     |          |
|    | b) | Explain the procedure for estimation of H.T lines for distribution line.                                                                                                                                                          | CO1,<br>CO3         | 7 Marks  |
|    |    | (UNIT-III)                                                                                                                                                                                                                        |                     |          |
| 5. | a) | A 15HP 415V 3-Phase, 50Kz squirrel cage induction motor is to be                                                                                                                                                                  | CO3.                | 8 Marks  |

installed in a pump house, of dimensions given in below Fig. Show its CO4 wiring diagram layout and estimate the quantity of materials required and its cost.



b) Describe the selection of switch gears for 33kV/11kV substation and draw substation lay out.

CO2, 6 Marks CO3, CO6

|     |    | (OR)                                                                                                                                                                                                                                                                                                                                                                                                   |                             |         |
|-----|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------|
| 6.  | a) | Explain in brief selection of distribution architecture.                                                                                                                                                                                                                                                                                                                                               | CO2,<br>CO3                 | 6 Marks |
|     | b) | Explain the how you will calculate full load current and decide size of the conductor size for the following motor.<br>i) DC Motor.                                                                                                                                                                                                                                                                    | CO3,<br>CO4                 | 8 Marks |
|     |    | ii) 3-phase induction motor (Assumerating of motor for explanation for both the cases).                                                                                                                                                                                                                                                                                                                |                             |         |
| 7.  | a) | A small area of 10 meters in diameter is to be illuminated by a lamp<br>suspended at a height of 4.5 meters over the center of area. A lamp having<br>an efficacy of 30 lumens per watt is fitted with a reflector which directs<br>the light output only over the surface to be illuminated. If the utilization<br>coefficient is 0.66 and illumination 850 lux, determine the wattage of the<br>lamp | CO1                         | 7 Marks |
|     | b) | Discuss inverse square law and cosine law of Illumination.                                                                                                                                                                                                                                                                                                                                             | CO1                         | 7 Marks |
| 8.  | a) | A hall of dimensions $40m \times 15m \times 5m$ is to be provided with a general illumination of 150 lumens/m <sup>2</sup> . 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:<br>i) normal. ii) inclined to 45 <sup>0</sup> .                                                                                                                                                                                                  | 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 $10m \times 10 cm \times 3cm$ . 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,<br>CO4,<br>CO5,<br>CO7 | 8 Marks |
|     | b) | Explain the classifications of resistance welding. What are its advantages and disadvantages?                                                                                                                                                                                                                                                                                                          | CO1,<br>CO5                 | 6 Marks |
| 10  | a) | (UR)<br>A 50 kW single phase 220V resistance over employees sirgular                                                                                                                                                                                                                                                                                                                                   | CO1                         | 8 Marks |
| 10. | a) | A 50 kW single phase, 220V resistance oven employees circular<br>nichrome wire for its heating element. If the wire temperature is not to<br>exceed 1500°C and the temperature of the charge is to be 450°C, calculate<br>the size and length of wire required. Assume $e = 0.95$ and radiation<br>efficiency K = 0.65. What would be the temperature of wire when the<br>charge is cold (25°C)?       | CO4,<br>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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## 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<br>All questions carry equal marks                                                                                                                                   |                |            |
|               |    |                                                                                                                                                                                                         |                |            |
| 1.            | a) | Two signals $x(n)$ and $h(n)$ given as, $x(n) = \{1,2,3,4,5\}$ and<br>$h(n)=\{5,4,3,2,1\}$ .<br>Determine the following signals.<br>i) $p(n)=2+x(n)$<br>ii) $q(n) = x(n)h(n)$<br>iii) $r(n) = 1.5 h(n)$ | CO1            | 6 Marks    |
|               | 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,<br>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,<br>CO4    | 10 Marks   |
|               | b) | Find the circular convolution of                                                                                                                                                                        | CO4            | 4 Marks    |
|               |    | $x(n) = \{1,3,4,-2,-5\} \text{ and } h(n) = \{1,2,-2,-5\}.$                                                                                                                                             |                |            |
|               |    | (UNIT-III)                                                                                                                                                                                              |                |            |
| 5.            | a) | Obtain direct form-I realization of the LTI system governed by the difference equation.<br>Y(n) = 1.5v(n-1) - 0.6v(n-2) - 0.2v(n-3) + r(n) - 1.5r(n-1)                                                  | CO3            | 8 Marks    |
|               | b) | Compare analog and digital filters                                                                                                                                                                      | CO1            | 6 Marks    |
|               | 0) | (OR)                                                                                                                                                                                                    | 001            | 0 10100110 |
| 6.            | a) | Design an IIR low-pass Butterworth filter using bilinear transformation for the following speciation's.                                                                                                 | CO3            | 9 Marks    |
|               |    | passband: $0.8 \le  H(e^{j\omega})  \le 1,  \omega  \le 0.2\pi$                                                                                                                                         |                |            |
|               |    | stopband: $ H(e^{j\omega})  \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 CO3 14 Marks  $H(e^{j\omega}) = j\omega$ ,  $-\pi \le \omega \le \pi$  using Hamming window for *N*=8 and also plot the magnitude response.

### (OR)

8. Design an ideal FIR LPF of length N=11 with cutoff frequency of 1KHz CO3 14 Marks 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.

## UNIT-V

- 9. a) How the memory is allocated in LF2407 DSP controller? Also give the CO5 8 Marks types of physical memory.
  b) List the common parts that are included in peripheral set of LF2407 CO5 (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 CO5, 14 Marks step and half step modes. CO6

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

#### **ELECTRICAL MACHINE DESIGN**

[Electrical and Electronics Engineering]

Time: 3 hours

Answer One Ouestion from each Unit

Max. Marks: 70

#### nswer One Question from each Uni All questions carry equal marks

## UNIT-I

- a) Illustrate the Faraday's Law of electro-magnetic induction and Justify the CO1 7 Marks "Change in flux linkages can be caused in three ways".
   b) What are the major considerations accounted for the good design of CO1 7 Marks
  - b) What are the major considerations accounted for the good design of CO1 7 Marks electrical machines?

#### (OR)

- 2. a) Discuss the design factors effecting temperature rise in electrical CO1 7 Marks machines during operation.
  - b) Calculate the specific electric and magnetic loading of 100HP, 300V, CO2 7 Marks 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.

## 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 CO3 7 Marks a 600kW, 500V, 900 r.p.m DC generator. Assume average gap density as 0.6 Wb/m<sup>2</sup> 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.

## (OR)

4. a) i) Prove that in a DC motor torque is proportional to the volume of active CO2 7 Marks material used.

ii) "Insulation decides the rating of the machines" - justify the statement.

b) Show that the output of a DC generator with a single coil is given by CO2 7 Marks ((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.

## UNIT-III

- 5. a) Derive an expression for the leakage reactance of a transformer with CO1 7 Marks primary and secondary cylindrical coils of equal length.
  - b) Calculate the approximate overall dimensions for a 200 kVA, CO5 7 Marks 6600/440V, 50Hz, 3-Phase core type transformer. The following data may be assumed:
    EMF per turn = 10V, Maximum flux density = 1.3 Wb/m<sup>2</sup>. Current density = 2.5 A/mm<sup>2</sup>. 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 = 0.6d<sup>2</sup>, with usual notations.

(OR)

- 6. a) Obtain an expression for the no load current of a single and three phase CO4 9 Marks transformer.
  - 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 CO1 6 Marks motor.
  - b) A 15kW, 400V, 3-Phase, 50Hz, 6-pole induction motor has a diameter of CO3 8 Marks 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.

#### (OR)

- 8. a) Explain the phenomenon of Cogging and Crawling of a 3-phase squirrel CO5 7 Marks cage induction motor. What are the rules used to avoid cogging and crawling on the torque speed characteristic of the motor?
  - b) A 90kW, 500V, 50Hz, 3-phase, 8-pole induction motor has a stator CO5 7 Marks 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.

## UNIT-V

- 9. a) Define short circuit ratio of a synchronous machine. What are its effects CO1 7 Marks on the machine performance?
  - b) Determine the main dimensions for a 10kVA, 3-phase, 400/230V, star CO2 7 Marks 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.

### (OR)

- 10. a) Derive the output equation of a synchronous machine and mention the CO1 7 Marks salient features
  - b) The field coils of a salient pole alternator are wound with a single layer CO2 7 Marks 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<sup>2</sup> of total coil surface. The mean length of turn is 1.2m. The resistivity of copper is  $0.021\Omega/m$  and mm<sup>2</sup>.

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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

## HVDC TRANSMISSION

#### [Electrical and Electronics Engineering]

Time: 3 hours

2.

b)

Max. Marks: 70

**Answer One Ouestion from each Unit** All questions carry equal marks

## UNIT-I

- 1. Write a short note about the different types of DC links with neat CO1 8 Marks a) sketches.
  - Write a brief summary of technical advantages of DC over AC CO6 6 Marks b) transmission.

#### (**OR**)

- Classify the inherent problems associated with HVDC transmission. CO<sub>2</sub> 6 Marks a)
- Illustrate the applications of HVDC transmission system in detail. 8 Marks b) CO<sub>2</sub>

### UNIT-II)

Draw the schematic diagram of a 6-pulse Gratez's circuit and explain its 3. CO2 14 Marks operation with overlap angle less than 60° and represent relevant voltage and current waveforms.

#### (**OR**)

Analyze the converter bridge characteristics both in rectifier and inverter CO5 4. 14 Marks modes of operation.

## UNIT-III)

Explain about the two basic firing schemes in HVDC system and list out CO5 5. 14 Marks the drawbacks of EPC scheme.

#### (**OR**)

Draw the diagram of basic power controller and explain about power flow CO2 6. 14 Marks controller in detail.

## UNIT-IV

- What are non-characteristic harmonics? Explain the effect of pulse CO1 7. 7 Marks a) number on harmonics.
  - Briefly explain about the design criteria of AC filters. CO3 7 Marks

#### (**OR**)

- Mention different types of filters? Explain about design of a high pass 8. a) CO3 10 Marks filter with the relevant equations. 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 CO2 14 Marks cause in detail.

### (**OR**)

Explain about the phenomena of protection against over currents in detail. 10. CO1 8 Marks a) Write a short note about arrangement a DC breaker with diagram. b) CO1 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

#### **ADVANCED CONTROL SYSTEMS** [Electrical and Electronics Engineering]

Time: 3 hours

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

Max. Marks: 70

## UNIT-I

1. What is lag compensator? Explain the procedure for the design of lag CO3 14 Marks compensator using root locus technique.

#### (**OR**)

- 2. What is PI controller? What are its effects on system performance? CO1 4 Marks a)
  - A unity feedback system has an open loop transfer function, b) CO3 10 Marks  $G(s) = \frac{50}{(s+3)(s+1)}$ . Design PI controller so that the phase margin of the

system is 35° at a frequency of 1.2 rad/sec.

### UNIT-II

3. Describe the concept of controllability and observability. Explain any two CO<sub>2</sub> 14 Marks testing methods to check controllability and observability of a system.

#### (**OR**)

- 4. Describe the principle of duality. CO1 4 Marks a)
  - b) Convert the following system matrix to canonical form. CO1 10 Marks

|            | 4 | 1   | - 2 |
|------------|---|-----|-----|
| <i>A</i> = | 1 | 0   | 2   |
|            | 1 | - 1 | 3   |

### 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 |
|    |    | $\ddot{e} + 3\xi_n \dot{e} + 2_n^2 e = 0$ ; where $\xi = 0.5$ ; $n = 1$ ; $e(0) = 1 \dot{e}(0) = 0$ |     |          |
|    |    | 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.                             |     |          |

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 CO4 14 Marks feedback control through pole placement.

### (OR)

10. Consider the closed loop poles at  $-1.5 \pm j4$ , -5.5, design a state feedback CO4 14 Marks 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'.

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## SREE VIDYANIKETHAN ENGINEERING COLLEGE

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

# SPECIAL ELECTRICAL MACHINES

[Electrical and Electronics Engineering]

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 2 $\Omega$ . 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 CO1 7 Marks Motor.
  - b) For a Linear Induction Motor, the supply frequency is equal to 24Hz, CO4 7 Marks 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.

### (OR)

- 10. a) Discuss the construction and principle of operation of Linear CO1 9 Marks Synchronous Motor with neat diagrams.
  - 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:                                                                        | CO2            | 8 Marks     |
|               |    | i) Pie charts. ii) Sankey diagrams.                                                            |                |             |
|               |    | (OR)                                                                                           | <b>G A</b>     |             |
| 2.            | a) | Define:                                                                                        | CO2            | 8 Marks     |
|               | h) | 1) Energy Index. 11) Cost Index.                                                               | $CO^{\circ}$   | 6 Marka     |
|               | 0) |                                                                                                | 008            | 0 Marks     |
| 2             |    |                                                                                                | 000            | 1434 1      |
| 3.            |    | Explain the roles and responsibilities of energy managers in industries.                       | 009            | 14 Marks    |
| 1             |    | (UR)                                                                                           | COS            | 14 Marks    |
| ч.            |    |                                                                                                | 000            | 14 Marks    |
| 5             |    | What are the different precedures that can be followed for proper                              | $CO^{2}$       | 14 Mortra   |
| э.            |    | what are the different procedures that can be followed for proper<br>ventilation in buildings? | COS            | 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                                 | CO2            | 14 Marks    |
| /.            |    | importance while energy auditing.                                                              | 002            | 1 T TOTUIND |
|               |    | (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                               | CO10           | 14 Marks    |
|               |    | merits and demerits.                                                                           |                |             |
|               |    | (OR)                                                                                           |                |             |
| 10.           |    | A chemical company is considering investment to an energy project                              | CO10           | 14 Marks    |
|               |    | 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.                                                    |                |             |
|               |    |                                                                                                |                |             |
|               |    |                                                                                                |                |             |
|               |    |                                                                                                |                |             |
|               |    |                                                                                                |                |             |
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|               |    |                                                                                                |                |             |

Determine (i) Payback period (ii) NPV at 15% interest

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### SREE VIDYANIKETHAN ENGINEERING COLLEGE

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

#### CAD / CAM [Mechanical Engineering]

Max. Marks: 70

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

### UNIT-I

| 1.  | a)<br>b) | How the product cycle is revised with introduction of CAD/CAM?<br>How CAD/CAM systems are evaluated? Explain in detail by categorizing<br>evaluation parameters during selection. | CO1<br>CO1 | 7 Marks<br>7 Marks |
|-----|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|
| 2   | a)       | What are the various memories used in a computer?                                                                                                                                 | CO1        | 7 Marks            |
| 2.  | 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 "u"  | CO6        | 7 Marks            |
|     | b)       | What is meant by a Geometric Entity? Explain the common entities used<br>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?<br>Explain with neat sketches.                                                                                | CO5        | 7 Marks            |
|     | b)       | What is meant by the DNC? Discuss how it is different from CNC. <b>(OR)</b>                                                                                                       | CO5        | 7 Marks            |
| 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            |
| 7   | a)       | What is group technology? Discuss machine call design in G T                                                                                                                      | $CO^{2}$   | 7 Morks            |
| 7.  | a)<br>b) | Explain briefly the OPITZ CLASS system of codification.                                                                                                                           | CO3        | 7 Marks<br>7 Marks |
| 8   | a)       | Differentiate between retrieval type and generative type CAPP systems                                                                                                             | CO3        | 7 Marks            |
| 0.  | u)       | List out the merits and demerits of each type                                                                                                                                     | 005        |                    |
|     | b)       | Explain about the production flow analysis                                                                                                                                        | CO3        | 7 Marks            |
|     | 0)       | UNIT-V                                                                                                                                                                            | 0.00       | , 1.101115         |
| 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)<br>b) | Compare and contrast, contact and non-contact inspection techniques.<br>Define CAD/CAM and CIM. Give a brief note of their application in industries.                             | CO4<br>CO4 | 7 Marks<br>7 Marks |
|     |          | \$\$ \$\$                                                                                                                                                                         |            |                    |

(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

CO1

7 Marks

7 Marks

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

### UNIT-I

a) Discuss elaborately on thermal conductivity of solids, liquids and gases. CO1 7 Marks
 b) Describe different types of boundary conditions applied to heat CO1 7 Marks conduction problems.

#### (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 CO5 7 Marks and outer surfaces are maintained at 50°C and 30°C 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.

### UNIT-II

- 3. a) Derive an expression for heat dissipated by a fin of uniform cross-section CO2 7 Marks with convective heat transfer at tip.
  - b) A copper cylinder 60cm diameter and 75cm long is initially at a uniform CO3 7 Marks temperature of 25°C. When the cylinder is exposed to hot flue gases, the surface temperature suddenly changes to 450°C. 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°C. Thermal diffusivity of copper is  $1.12 \times 10^{-4} \text{ m}^2/\text{s}$ .

#### (OR)

- 4. a) A very long copper rod 20mm in diameter extends horizontally from a CO3 7 Marks plane heated wall maintained at 100°C. The surface of the rod is exposed to an air at 20°C with heat transfer coefficient of 8.5 W/m<sup>2</sup> 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.
  b) Evaluate the significance of Healer and Craher shorts.
  - b) Explain the significance of Hesler and Grober charts. CO1 7 Marks

### (UNIT-III)

- 5. a) Explain the concept of boundary layer theory.
  - b) A 50cm long glass plate is hung vertically in air at 35°C while the CO4 temperature is maintained at 85°C. 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.

### (OR)

6. a) Derive the Von-Karman integral equation.
b) A plate of length 750mm and width 250mm has been placed CO4 7 Marks 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.

2

7. Derive LMTD equation for counter flow heat exchanger. a)

A heat exchanger is to be designed to condense 8 kg/s of an organic liquid CO3 b)  $(t_{sat} = 80^{\circ}C: h_{fg} = 600 \text{ kJ/kg})$  with cooling water available at 15°C and at a flow rate of 60kg/s. The overall heat transfer coefficient is 480 W/m<sup>2</sup> 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.

### (**OR**)

8. Explain the regimes of Pool boiling curve. a)

- Water at atmospheric pressure is to be boiled in polished copper pan. The 7 Marks CO4 b) diameter of the pan is 350mm and is kept at 115°C. Calculate the following:
  - i) Power of the burner.
  - ii) Rate of evaporation in kg/hr.
  - iii) Critical heat flux.

### UNIT-V

9. a) Derive an expression  $E_b = \pi I_b$ .

> Determine the radiant heat exchange per m<sup>2</sup> area for two infinite parallel CO4 b) 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.

### (**OR**)

- 10. Discuss on shape factor algebra with simple sketches. a)
  - Estimate the solar radiation on a plate normal to the sun rays. Assume the b) CO3 8 Marks sun to be a black body at a temperature of 5520°C. The diameter of the sun is  $1.39 \times 10^{6}$  Km and its distance from the earth is  $1.5 \times 10^{8}$  km.

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7 Marks

CO1

CO1

CO<sub>2</sub> 7 Marks

7 Marks

6 Marks

CO<sub>2</sub> 7 Marks 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

### NON-CONVENTIONAL ENERGY SOURCES

[Mechanical Engineering]

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:                                                                                                                                     | CO1 | 6 Marks  |  |  |
|    |    | i) Altitude angle. ii) Incident angle.                                                                                                                |     |          |  |  |
|    |    | iii) Zenith angle. iv) Solar Azimuth angle.                                                                                                           |     |          |  |  |
|    |    | v) Latitude angle. vi) Declination angle.                                                                                                             |     |          |  |  |
|    | 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. <b>(OR)</b>                                                                | CO2 | 6 Marks  |  |  |
| 4  | a) | Classify various types of air collectors with suitable sketches.                                                                                      | CO3 | 8 Marks  |  |  |
|    | b) | <ul> <li>b) Why orientation is needed in concentrating type collectors? Describe various method of sun tracking.</li> </ul>                           |     |          |  |  |
|    |    | 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? (OR)                                                                                         | CO5 | 7 Marks  |  |  |
| 10 |    | Explain with neat sketches the various methods of Tidal power generation.<br>What are the limitations of each method?                                 | CO5 | 14 Marks |  |  |

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

# GAS TURBINES AND JET PROPULSION

Time: 3 hours

# [Mechanical Engineering]

Max. Marks: 70

7 Marks

#### 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 CO1 7 Marks open cycle gas turbine and enumerate the various uses of gas turbine.
  - b) The gas turbine unit has a pressure ratio of 6:1 and maximum cycle CO2 7 Marks temperature of 610°C. 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 15°C at the rate of 16 kg/s.

### (OR)

2. The pressure ratio of open cycle gas turbine power plant is 5.6. Air is CO1, 14 Marks taken at 30°C and 1 bar. The compression is carried out in two stages with perfect inter-cooling in between. The maximum temperature of the cycle is limited to 700°C. 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  $c_p = 1.02 \text{ kJ/kg K}$  and  $\gamma = 1.41$ .

### UNIT-II

- 3. a) Explain the working of Centrifugal compressor with the aid velocity CO1, 7 Marks diagrams CO2
  - b) An axial flow compressor with an overall isentropic efficiency of 85% CO2 draws air at 20°C 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  $\alpha_1=12^\circ$  and  $\beta_1=42^\circ$ .

#### (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 CO2 7 Marks and 20°C 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 16° and 40° at entry and exit. Calculate mass flow rate of air, degree of reaction and power input and width of blades at outlet.

### UNIT-III

- 5. a) What are the requirements of Gas turbine combustion chamber? Explain CO3 7 Marks the various forms of combustion.
  - b) Explain the performance and operating characteristics of combustion CO4 7 Marks chamber.

#### (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

| Explain the working principle of Turbo-Jet with the aid of neat sketch<br>and define the following terms related to jet propulsion. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 7 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| i) thrust. ii) thrust power.                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| iii) propulsive efficiency. iv) thermal efficiency.                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Explain the working of Ram jet and discuss the advantages and disadvantages.                                                        | CO4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 7 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| (OR)                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Explain the working of turboprop engine and turbofan engine.                                                                        | CO1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 7 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Why is thrust augmentation necessary? What are the methods for thrust                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 7 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| augmentation in a turbojet engine?                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| UNIT-V                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Classify the rackets and discuss about various types of propellants.                                                                | CO1,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 7 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                                                                                     | CO5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Derive expression for optimum expansion ratio for rocket.                                                                           | CO1,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 7 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| (OR)                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Explain briefly the working principle of rocket and derive the expression                                                           | CO1,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 7 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| for propulsion efficiency of a rocket in-terms of speed ratio.                                                                      | CO5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| State the difference between jet propulsion and rocket propulsion and                                                               | CO4,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 7 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| discuss about the advantage of using nuclear thermal rocket for space propulsion.                                                   | CO5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                                                                                     | Explain the working principle of Turbo-Jet with the aid of neat sketch<br>and define the following terms related to jet propulsion.<br>i) thrust.<br>ii) thrust power.<br>iii) propulsive efficiency.<br>Explain the working of Ram jet and discuss the advantages and<br>disadvantages.<br><b>(OR)</b><br>Explain the working of turboprop engine and turbofan engine.<br>Why is thrust augmentation necessary? What are the methods for thrust<br>augmentation in a turbojet engine?<br><b>UNIT-V</b><br>Classify the rackets and discuss about various types of propellants.<br>Derive expression for optimum expansion ratio for rocket.<br><b>(OR)</b><br>Explain briefly the working principle of rocket and derive the expression<br>for propulsion efficiency of a rocket in-terms of speed ratio.<br>State the difference between jet propulsion and rocket propulsion and<br>discuss about the advantage of using nuclear thermal rocket for space<br>propulsion. | Explain the working principle of Turbo-Jet with the aid of neat sketch<br>and define the following terms related to jet propulsion.CO1,<br>CO4i) thrust.ii) thrust power.iii) propulsive efficiency.iv) thermal efficiency.Explain the working of Ram jet and discuss the advantages and<br>disadvantages.CO4(OR)Explain the working of turboprop engine and turbofan engine.CO1Why is thrust augmentation necessary? What are the methods for thrust<br>augmentation in a turbojet engine?CO1CO1CO1Classify the rackets and discuss about various types of propellants.CO1,<br>CO5CO5(OR)Explain briefly the working principle of rocket and derive the expression<br>for propulsion efficiency of a rocket in-terms of speed ratio.CO1,<br>CO5CO5State the difference between jet propulsion and rocket propulsion and<br>discuss about the advantage of using nuclear thermal rocket for space<br>propulsion. |

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

### HYDRAULICS AND PNEUMATICS

[Mechanical Engineering]

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) | b) What are the desirable properties of hydraulic fluids? Disuss any two of them in detail.                                                                                                                                                                                 |     |         |  |
|    |    | (OR)                                                                                                                                                                                                                                                                        |     |         |  |
| 2. | a) | A pump has a displacement volume of 90cm <sup>3</sup> . It delivers 0.75m <sup>3</sup> /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<br>and slow movement of ram.                                                                                                                                                                       | CO4 | 7 Marks |  |
|    | b) | Explain the working of five way two position direction control valve.                                                                                                                                                                                                       | CO3 | 7 Marks |  |
| 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 |  |

Discuss motion and control diagrams. CO5 7 Marks

Time: 3 hours

## UNIT-V

9. Develop an electro pneumatic circuit for the following sequence CO6 14 Marks A+B+A-B- where A and B stand for cylinder (+) indicates extension and (-) indicates retraction of cylinders

### (OR)

- 10. a)Describe different logic gates used in pneumatic circuits.CO57 Marks
  - b) Explain pilot assisted solenoid control of directional control valves. 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

#### 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 CO1 14 Marks Supply Chain decisions on the success of a firm.

### (OR)

2. Give an example of a Supply Chain of your choice that has evolved over CO1 14 Marks a period of time.

### UNIT-II

| 3. | a)  | a) Explicate the difference between FIFO and LIFO.            |     | 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 |
|    | 1 \ |                                                               | 000 | 7 ) ( 1 |

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 CO3 14 Marks Chain.

#### (OR)

6. Examine the role of Information Technology in the supply chain of an CO3 14 Marks Automobile industry. Explicate with a practical example.

### UNIT-IV

7. Differentiate between Distribution Channel and Transaction Channel in CO4 14 Marks Supply Chain Transportation.

#### (**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 CO2 14 Marks Management using Flow Chart.

#### (OR)

10. Examine the role of B2B and B2C in Supply Chain Management for a CO5 14 Marks global manufacturing company. Explicate the process and how it is done using a practical example.

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#### 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

CO<sub>2</sub>

8 Marks

### 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 CO1 8 Marks the field component in a rectangular wave guide.
  - b) An air-filled rectangular waveguide of inside dimensions 7 x 3.5cm CO1 6 Marks 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.

#### (OR)

2. Derive the wave equation for TM wave and TE wave. Obtain the CO1 14 Marks expression for the field component in a rectangular wave guide.

### UNIT-II)

3. a) Explain the following terms:

- i) Antenna effective height.
- ii) Antenna aperture.
- iii) Current distribution on a thin wire antenna.
- b) An antenna has a radiation resistance of  $72\Omega$ , a loss resistance of  $8\Omega$  and CO3 6 Marks a power gain of 12-dB. Determine the antenna efficiency and its directivity.

#### (OR)

- 4. a) Define radiation resistance of an antenna. Calculate the radiation CO4 7 Marks resistance of a  $\lambda$  /10wire dipole in free space.
  - 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 CO5 8 Marks of arrays.
  - b) Calculate: CO2

i) HPBW.

ii) Solid angle, if a linear array having 10 isotropic point source with  $\lambda/2$  spacing and phase difference  $\delta$ =900.

#### (**OR**)

- 6. a) What is a broadside array? Explain in detail the structure, radiation CO5 7 Marks pattern and the principle of operation of such an antenna.
  - b) Write a brief note on binomial arrays.

CO5 7 Marks

6 Marks

### UNIT-IV

- 7. a) With a neat sketch, explain the different types of horn antennas. Mention CO4 8 Marks merits and demerits of each type.
  - b) A Parabolic dish provides a power gain of 50dB at 10GHz, with 70% CO2 6 Marks efficiency. Find out i) HPBW. ii) BWFN.

### (OR)

- 8. a) What is spillover with reference to parabolic reflectors? Explain the CO4 7 Marks remedial measures to reduce spillover.
  - b) Explain the principle of parabolic reflector antenna and discuss on CO5 7 Marks different types of feeds.

### 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 CO5 7 Marks about it.

#### (OR)

- 10. a)Evaluate the directivity of:CO57 Marks
  - i) An isotropic source.
  - ii) Source with bidirectional  $\cos\theta$  power pattern.
  - b) Explain in detail the terms beam efficiency and directivity. Use relevant CO6 7 Marks expression a diagram.

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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.                                                                                                                 | CO4 | 7 Marks |
|----|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------|
|    |    | i) $y(n) = x(n) + x(n-1);$ ii) $y(n) = n x(n).$                                                                                                                                                   |     |         |
|    | b) | Given the sequence $x(n)=(5-n)[u9n0-u9n-5)$ , make a sketch of:                                                                                                                                   | CO2 | 7 Marks |
|    |    | i) $y(n) = x(4 - n);$ ii) $y(n) = x(n^2 - 2n + 1).$                                                                                                                                               |     |         |
|    |    | (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.                                                                                                                                          | CO2 | 7 Marks |
|    |    | $x_1(n) = \{1, 2, 3, 4\}$ and $x_2(n) = \{1, 1, 2, 1\}$                                                                                                                                           |     |         |
|    | 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                                                                                                                                   | CO2 | 7 Marks |
|    |    | y(n) = -0.1y(n-1) + 0.2y(n-2) + 3x(n) + 3.6x(n-1) + 0.6x(n-2)                                                                                                                                     |     |         |
|    |    | (OR)                                                                                                                                                                                              |     |         |
| 6. | a) | Design a digital low pass Butterworth digital IIR filter which is required to meet the following specifications.                                                                                  | CO5 | 7 Marks |
|    |    | Pass band attenuation $\leq 2$ dB, Pass band edge frequency = 4KHz, Stop band attenuation $\geq 40$ dB, Stop band edge frequency = 8KHz, Sampling rate = 24 KHz by using bilinear transformation. |     |         |
|    | 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<br>of an FIR system given by                                                                                           | CO3 | 7 Marks |
|    |    | $H(z) = \left(1 - \frac{1}{4}z^{-1} + \frac{3}{8}z^{-2}\right)\left(1 - \frac{1}{8}z^{-1} - \frac{1}{2}z^{-2}\right).$                                                                            |     |         |
|    |    | (OR)                                                                                                                                                                                              |     |         |

- 8. a) Analyse the characteristics of rectangular, Bartlet and Blackman windows CO3 7 Marks with neat sketch.
  - b) Design a Linear phase band pass FIR filter with cutoff frequencies in the CO3 7 Marks range  $0.4\pi$  to  $0.6\pi$  rad/sample by taking 7 samples of hamming window.

### UNIT-V

- 9. a) Explain various types of general purpose registers in TMS 320C6X DSP CO1 7 Marks processor.
  - 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 CO1 7 Marks advantages and disadvantages of VLIW architecture.
  - b) Discuss in detail bout pipelining of instruction execution in DSP CO1 7 Marks processors.

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SVEC-16 Roll No.

Max. Marks: 70

### SREE VIDYANIKETHAN ENGINEERING COLLEGE

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

#### **IMAGE PROCESSING**

#### [Electronics and Communication Engineering]

Time: 3 hours

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)<br>b) | Discuss about the arithmetic and logical operations.<br>Find the discrete cosine transform and its inverse for the following | CO1<br>CO4 | 6 Marks<br>8 Marks |
|     | -)       | images:                                                                                                                      |            |                    |
|     |          | 3 6 2 4                                                                                                                      |            |                    |
|     |          | 1) 6 4 	 11) 6 1                                                                                                             |            |                    |
|     |          | 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                                                        | CO5        | 7 Marks            |
|     | ,        | lowpass filters in frequency domain.                                                                                         |            |                    |
|     |          | (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            |
| 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                                                        | CO1        | 7 Marks            |
|     | ,        | a neat block diagram.                                                                                                        |            |                    |
|     | b)       | Discuss about bit plane coding.                                                                                              | CO2        | 7 Marks            |
|     |          | (OR)                                                                                                                         |            |                    |
| 8.  | a)       | Explain dictionary based compression with an example.                                                                        | CO6        | 7 Marks            |
|     | b)       | UNIT-V                                                                                                                       | COI        | / Marks            |
| 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        | / Marks            |

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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

- a) Draw the block diagram of Radar and explain its working in detail.
   b) Calculate the maximum range of Radar system which operates at 3cm
   CO4
   CO4
   7 Marks
  - b) Calculate the maximum range of Radar system which operates at 3cm CO4 7 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<sup>2</sup>, and Radar cross section of the target is 20m<sup>2</sup>.

#### (**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. CO4 7 Marks
  - A radar has repletion requercy of roboriz. Estimate range of radar. CO4 / Marks Assume the presence of noise.



- 3. a) Summarize briefly about the Frequency Modulated Continuous Wave CO2 7 Marks radar system with suitable block diagram.
  - b) Describe briefly about the Doppler frequency shift in radar operation. A CO4 7 Marks 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.

### (OR)

- 4. a) With neat diagram, explain the working principle of conventional CO1 7 Marks Continuous Wave (CW) radar.
  - b) Distinguish between Pulse Doppler Radar (PDR) and Moving Target CO1 7 Marks Indicator (MTI) Radar.

### UNIT-III)

5. Illustrate the working principle of conical scan tracking method with neat CO4 7 Marks a) diagram. Discuss about the working principle of sequential lobbing with neat CO4 7 Marks b) diagram for the application of target tracking. (**OR**) 6. Compare the advantages and disadvantages of different target trackers. CO5 7 Marks a) Draw the functional block diagram of the lobe switching tracking radar CO4 7 Marks b) system and explain its working principle. UNIT-IV 7. Discuss in brief about: CO1 a) 7 Marks i) branch-type duplexer. ii) circulator as duplexer. Explain how radar signals can be detected under noise considerations. b) CO5 7 Marks (OR)Describe the design procedure of matched filter receiver. 8 CO3 7 Marks a) Calculate the receiver bandwidth if the noise figure of a radar receiver is CO4 7 Marks b) 1 dB and the available gain is 400. The available noise output power of the receiver is 4 dB. Assume necessary data if required.

### (UNIT-V)

9. Explain the operation of VOR system. CO5 7 Marks a) Explain the operations of LORAN system. CO5 7 Marks b) (OR) 10. Explain the source of errors in VOR system. CO6 7 Marks a) Explain the operations DECCA systems. b) CO5 7 Marks \$\$ \$\$ \$\$

9.

10.

a)

b)

a)

b)

Write about HFC Networks.

i) CM & CMTS.

Explain about Virtual Tributaries.

Write short notes on:

Explain about synchronous Transport Signals.

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

# TELECOMMUNICATION SWITCHING SYSTEMS

[Electronics and Communication Engineering]

Max. Marks: 70

CO1

CO1

CO1

CO1

7 Marks

7 Marks

7 Marks

7 Marks

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 |

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ii) DOCSIS.

(**OR**)

UNIT-V )

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

#### DIGITAL CMOS IC DESIGN [Electronics and Communication Engineering]

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      |
| 2   | a)        | (UK)<br>Articulate the operation of MOS Transistor Characteristic under Static | CO1        | 10 Marks     |
| 2.  | <i>a)</i> | and Dynamic Conditions                                                         | COI        |              |
|     | 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      |
| 1   | a)        | (OR)                                                                           | CO4        | 7 Morka      |
| 4.  | a)        | Technology                                                                     | 004        | / WIAIKS     |
|     | 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                | CO1        | 8 Marks      |
|     |           | flash with neat sketch.                                                        |            |              |
| 6   | a)        | (UR)<br>Explain the characteristics of Static Pandom Access Memory             | CO1        | 1 Marks      |
| 0.  | a)<br>b)  | Articulate the Read and Write operation of SRAM cell with neat Sketch          | CO1<br>CO5 | 10 Marks     |
|     | 0)        | (UNIT-IV)                                                                      | 000        | 10 11 10 110 |
| 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      |
| 8   |           | (UK)<br>Illustrate the concent of Timing classification of Digital System      |            |              |
| 0.  |           | 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      |
|     |           | $(\mathbf{OR})$                                                                | 000        | 4 Marks      |
| 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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III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

#### INFORMATION THEORY AND CODING

[Electronics and Communication Engineering]

Answer One Question from each Unit All questions carry equal marks Max. Marks: 70

### UNIT-I )

1. Consider a discrete memory less source with source probabilities CO1 4 Marks a) {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. b) Consider the following source: CO1 10 Marks S = (A, B, C, D, E, F)P = (0.10, 0.15, 0.25, 0.35, 0.08, 0.07)Apply Shannon-Fanon algorithm to find the code words and also find coding efficiency, redundancy. (**OR**) 2. Apply the Huffman coding procedure for the following message CO1 7 Marks a) ensemble:  $[X] = [x_1]$  $x_2$  $x_3$  $x_4$ *x*<sub>6</sub>  $x_8$  $x_5$  $x_7$  $[P] = \begin{bmatrix} 0.25 & 0.125 & 0.625 & 0.62 & 0.625 & 0.25 & 0.625 & 0.125 \end{bmatrix}$ Estimate code efficiency and redundancy. b) Let 'X' represent the outcome of a single roll of a fair die. Find the CO1 3 Marks entropy of 'X'. A certain digital frame consists of 15 fields. The first and the last field. Of CO1 4 Marks c) 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. UNIT-II Compute Channel capacity of the following channels: 3. CO2 7 Marks a) i) Lossless. ii) Deterministic. iii) Noiseless. iv) Binary Symmetric Channel. b) Consider a binary symmetric channel as shown in below figure. Estimate CO<sub>2</sub> 7 Marks the rate of Information transmission over this channel when 'p' value is 0.8. Assume that symbol rate is 2000 symbols/sec.



4.

A Binary symmetric Channel has the following noise matrix

CO3

14 Marks

$$p(X_1) = \frac{2}{3} \text{ and } p(X_2) = \frac{1}{3} p\left(\frac{Y}{X}\right) = \begin{bmatrix} \frac{3}{4} & \frac{1}{4} \\ \frac{1}{4} & \frac{3}{4} \end{bmatrix}$$

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).

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,

 $S_1 = r_1 + r_2 + r_{3+}r_5$ 

 $S_2 = r_1 + r_2 + r_{4+}r_6$ 

 $S_3 = r_1 + r_3 + r_{4+}r_7$ 

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  $g(x) = 1 + x + x^2$ . CO4 7 Marks Obtain the code Polynomial in a systematic form for the following information sequences:

i) 1011. ii) 1001.

- b) Consider a (3, 1, 3) Convolution code with generator polynomials CO4 7 Marks  $g_1 = (1 \ 1 \ 1 \ 0), g_2 = (1 \ 0 \ 0 \ 1)$  and  $g_3 = (1 \ 1 \ 0 \ 1)$ . Do the following:
  - 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 CO4 7 Marks for the received polynomial  $r(x) = x^3 + x^5 + x^6$ .
  - 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.

9. Explain how Coding and Interleaving applied to the compact disc digital CO5 14 Marks audio system.

### (OR)

CO5 14 Marks

- 10. Write short note on:
  - i) R-S codes.
  - ii) Concatenated codes.
  - iii) Turbo codes.

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

### LIGHT WAVE COMMUNICATIONS

[Electronics and Communication Engineering]

Max. Marks: 70

### Answer One Question from each Unit.

#### All questions carry equal marks

### UNIT-I

CO1 1. Explain the law of Optics. 7 Marks a) A light wave is travelling in a semiconducter medium of refractive index CO4 7 Marks b) 3.6. It is incident on a different semiconducter medium of refractive index 3.4 and the angle of incidence is  $80^{\circ}$  will this result in TIR. (**OR**) 2. Explain the fundamental block diagram for fiber optics communication. CO1 7 Marks a) A light ray is incident from medium -1 to medium -2. if the refractive CO4 7 Marks b) indices of mediums are 1.8 and 1.5 respectively, then determine the angle of refraction for an angle of incidence of  $40^{\circ}$ . UNIT-II 3. Explain core and cladding losses. CO<sub>4</sub> 7 Marks a) b) Consider two silica fibers that are doped with 6% mole fractions of Geo2. CO<sub>4</sub> 7 Marks Compute the UV absorption loss at  $\lambda = 1.3 \mu m$ . (**OR**) 4. Write a short note on Intramodel dispersion. **CO4** 7 Marks a) Consider two silica fibers that are doped with 20% mole fractions of CO4 b) 7 Marks Geo2. Compute the UV absorption loss at  $\lambda$ =0.7µm. (UNIT-III) 5. Discuss the operation of edge-emitting double-hetero junction LED, with CO3 14 Marks neat schematic diagram. (**OR**) 6. Discuss about the signal frequency, single mode injection lasers with CO3 14 Marks fabry- perot structure and explain the methods of controlling longitudinal modes of ILDs. UNIT-IV) 7. 7 Marks a) Explain the concept of fiber joints. CO1 A Step index fiber has a core refractive index of 1.5 and core diameter of CO4 7 Marks b) 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. (**OR**) Explain the different fiber connectors in brief. 8. CO1 7 Marks a) b) Two single mode fibers with mode -field diameters of 9.2µm and 8.4µm CO<sub>4</sub> 7 Marks are to be connected together. Assuming no extrinsic losses, determine the loss at the connection due to the mode-field diameter mismatch. UNIT-V 9. Write short notes on optical networks. CO1 14 Marks i) network terminology. ii) network categories. iv) network topologies. iii) network layers. (**OR**) 10. Explain the principle of WDM networks. CO5 14 Marks

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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                                            |                |            |
|               |          |                                                                            |                |            |
| 1             | a)       | What are goals of Software Testing? Explain                                | CO1            | 6 Marka    |
| 1.            | $a_{j}$  | Why Effective testing is hard? Explain with example                        | CO1            | 0 Marks    |
|               | 0)       | (OR)                                                                       | COI            | o wiaiks   |
| 2.            | a)       | With a neat diagram, explain about all the elements in Software Testing    | CO1            | 8 Marks    |
|               | -        | model.                                                                     |                |            |
|               | b)       | What is the difference between :                                           | CO2            | 6 Marks    |
|               |          | i) Verification and Validation;                                            |                |            |
|               |          | ii) Static and Dynamic testing.                                            |                |            |
|               |          | (UNIT-II)                                                                  |                |            |
| 3.            | a)       | What are the challenges in white box testing? Explain about Basis Path     | CO2            | 6 Marks    |
|               |          | testing with suitable example.                                             |                |            |
|               | b)       | How do you calculate the cyclomatic complexity number of the program       | CO2            | 8 Marks    |
|               |          | having many connected components? Explain with an example.                 |                |            |
|               | `        | (OR)                                                                       | <b>GO2</b>     | 0.14       |
| 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 | CO3            | 6 Marks    |
|               | • \      | test scenarios for effective black box testing.                            |                |            |
|               | b)       | Give examples of:                                                          | CO3            | 8 Marks    |
|               |          | 1) Decision-table lesting.                                                 |                |            |
|               |          | 11) Cause-Effect Graphic-based Testing.                                    |                |            |
| 6             | a)       | (UK)<br>Design and explain in detail about Equivalence Class testing       | CO3            | 8 Marks    |
| 0.            | a)<br>h) | What are the software implementation issues in state testing? Explain      | CO3            | 6 Marks    |
|               | 0)       |                                                                            | 004            | 0 Iviains  |
| 7             |          | Driefly write the stars of test planning and test process for finding      | CO4            | 9 Martra   |
| 1.            | a)       | factorial of a number                                                      | C04            | 8 IVIAIKS  |
|               | b)       | Describe about test case design for validating a user                      | CO4            | 6 Marks    |
|               | 0)       | (OR)                                                                       | 04             | 0 Iviai KS |
| 8             | a)       | Write short notes on Size Metrics                                          | CO5            | 8 Marks    |
| 0.            | 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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### 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 Explain Hebb Network. CO2 7 Marks b) (**OR**) Explain the classification of Hybrid Systems. 2. a) CO<sub>2</sub> 7 Marks Write about the applications of Soft Computing. CO2 7 Marks b) UNIT-II 3. Explain the Perceptron testing algorithm for Single and Multiple Output CO2 10 Marks a) Classes. What is supervised learning? CO1 4 Marks b) (**OR**) Explain the testing algorithm for back-Propagation Networks. 4. a) CO1 7 Marks Write about perceptron learning rule. CO3 b) 7 Marks (UNIT-III) What is self-organizing map and discuss the algorithm and features of CO2 5. 14 Marks Kohonen's map? (**OR**) 6. Construct and test the Hamming network to cluster four vectors. Given CO4 14 Marks the example Vectors are e(1)=[1 -1 -1 -1];e[2] = [-1 - 1 - 1 1]The bipolar input vectors are  $X_1 = [1 -1 1 -1]$  $X_2 = [-1 \ -1 \ 1 \ 1];$  $X_3 = [-1 \ -1 \ -1 \ +1];$  $X_4 = [1 \ 1 \ -1 \ -1].$ UNIT-IV) With the help of examples, explain various fuzzy prepositions. 7. a) CO5 7 Marks Show that the following fuzzy sets satisfy DeMorgan's law: CO4 7 Marks b) i)  $\mu A(x) = 1 / 1 + 5X$ ii)  $\mu B(\mathbf{x}) = (1 / 1 + 5x)^{1/2}$ (**OR**) Discuss in detail the operations and properties of fuzzy sets. 8. CO3 7 Marks a) Explain the different methods for fuzzy approximate reasoning. CO3 7 Marks b) UNIT-V 9. Explain in detail about various operators involved in genetic algorithm. a) CO3 7 Marks Explain the role of fitness function in Genetic algorithms. b) CO6 7 Marks (**OR**) 10. Explain the genetic operators and fitness functions in respect of CO6 14 Marks evolutionary computing.

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

#### WIRELESS NETWORKS

#### [Computer Science and Engineering]

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

#### PRINCIPLES OF PROGRAMMING LANGUAGES

[Computer Science and Engineering]

Max. Marks: 70

Time: 3 hours

### 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.<br>(OR)                                                                                  | CO1 | 7 Marks |
| 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 |
| 5.  | a) | What is meant by subprogram level concurrency? Explain.                                                                                  | CO1 | 7 Marks |
|     | b) | Explain about Co-Routines with an example.<br>(OR)                                                                                       | CO3 | 7 Marks |
| 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 |
| 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 |
| 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 |
| 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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#### 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 CO2 7 Marks after the following program:

MOVLW 0 MOVWF 12H MOVLW 22H ADDWF 12H, W ADDWF 12H, W ADDWF 12H, W ADDWF 12H, W.

#### (OR)

| 2. | a) | Explain in detail about PIC status register.                                                                                                                                                                                                                         | CO1 | 6 Marks |
|----|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------|
|    | b) | Write a program to                                                                                                                                                                                                                                                   | CO2 | 8 Marks |
|    |    | <ul> <li>i) place each of your 5-digit ID numbers into a RAM location starting at 0.</li> <li>ii) add each digit to WREG and store the sum in RAM location 6.</li> <li>iii) use the program listing and show the ROM memory addresses and their contents.</li> </ul> |     |         |
|    |    | 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 CO4 6 Marks wave of 50 Hz frequency on pin PORTB.7. Use Timer 0, 16 bit mode with prescaler = 128

### (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 CO3 14 Marks (command/data) to the LCD without checking the busy flag and the delay between the issuing character is 5-10 ms(simple delay).

### (OR)

6. a) Write a program to rotate the stepper motor by an angle of 180°. Assume CO1 8 Marks step size of 1.8°.

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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<br>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 |  |  |
|     |    |                                                                                                                         |     |         |  |  |
| 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<br>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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#### 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 Derive the transfer function of the tank interacting liquid system. 1. CO<sub>2</sub> 7 Marks a) Give the characteristics of thermal process and derive the transfer CO2 b) 7 Marks function for single time constant type thermal process. (**OR**) 2. Explain the elements of process control with a neat diagram. CO1 7 Marks a) b) Explain Servo and Regulatory operation in process control. CO1 7 Marks UNIT-II ) 3. Explain On-Off controller characteristics with suitable example. CO1 7 Marks a) Discuss the working of electronic PID controller and mention the b) CO1 7 Marks methods for adjusting P, I and D settings. (**OR**) 4. Explain in detail about Pneumatic PID controller with suitable example. CO1 7 Marks a) b) Compare the characteristics of P, PI and PID control actions. CO3 7 Marks (UNIT-III) 5. Describe the points to be considered in selecting controller modes. CO1 7 Marks a) Mention the criteria for good control. Compare and contrast the features of Ziegler-Nichol's and Cohen-Coon CO1 b) 7 Marks methods of tuning. (**OR**) 6. Explain the frequency response method in controller tuning. CO1 7 Marks a) Time integral criteria lead to unique solution to determine the controller b) CO3 7 Marks parameters. Justify. UNIT-IV 7. What is an actuator? List the types of actuators. CO1 7 Marks a) Identify suitable control valve with one part opening and one seat plug. 7 Marks b) CO6 Explain it with a neat diagram. (**OR**) 8. Explain clearly about hydraulic actuator. CO1 7 Marks a) Explain the operation of rotating shaft control valve with neat diagrams b) CO1 7 Marks UNIT-V 9. Write about the analysis of cascade control for set point changes and load CO6 7 Marks a) changes. b) Explain the role of load expression in implementing feed forward transfer CO6 7 Marks function. (**OR**) 10. Discuss the working of distillation column with suitable application. a) CO1 7 Marks Explain clearly about over-ride control with neat sketch. CO1 7 Marks b)

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SVEC-16

SVEC-16 Roll No.

# 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]

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<br>and illustrate the operation.                                                                                 | CO1        | 7 Marks            |
|     |           | (OR)                                                                                                                                                                                  |            |                    |
| 2.  | a)<br>b)  | Explain various splicing techniques with neat diagrams.<br>Demonstrate about Pulse dispersion in step index fibers with the necessary equations and diagrams                          | CO1<br>CO1 | 7 Marks<br>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)<br>b)  | Write short notes on fiber grating sensors and acoustic sensors.<br>List any three applications of optical fibers for instrumentation and<br>explain them with the necessary figures. | CO3<br>CO3 | 7 Marks<br>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            |
|     | D)        | Describe the structure and operation of glass fiber laser.                                                                                                                            | COI        | / Marks            |
| 7   | a)        | With next sketches explain the operation of Laser Doppler velocity                                                                                                                    | CO5        | 7 Marks            |
| 1.  | <i>a)</i> | meter.                                                                                                                                                                                | 005        |                    |
|     | 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            |
| 9   | a)        | Discuss the phenomenon of electro-ontic effect with next sketches                                                                                                                     | $CO^2$     | 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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Time: 3 hours

| COL                                                                       | DE No.  | : 16BT61006                                                                                               |        | SVEC-16   |  |  |  |
|---------------------------------------------------------------------------|---------|-----------------------------------------------------------------------------------------------------------|--------|-----------|--|--|--|
|                                                                           |         | Roll No.                                                                                                  |        |           |  |  |  |
|                                                                           |         | SREE VIDYANIKETHAN ENGINEERING COLLEGE<br>(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu) |        |           |  |  |  |
| Π                                                                         | I B.7   | <b>Fech II Semester (SVEC-16) Regular/Supplementary Examinations</b>                                      | Augus  | st - 2021 |  |  |  |
| AIRCRAFT INSTRUMENTATION<br>[Electronics and Instrumentation Engineering] |         |                                                                                                           |        |           |  |  |  |
| Time                                                                      | e: 3 ho | ours<br>Answer One Question from each Unit<br>All questions carry equal marks                             | Max. I | Marks: 70 |  |  |  |
|                                                                           |         | 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. <b>(OR)</b>                           | CO3    | 14 Marks  |  |  |  |
| 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

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

#### **PROGRAMMABLE LOGIC CONTROLLERS**

[Electrical and Electronics Engineering]

Max. Marks: 70

# Answer One Question from each Unit

All questions carry equal marks UNIT-I List the benefits offer by PLC. Explain at least four in brief. 1. CO6 7 Marks a) Explain difference between fixed I/O's and modular I/O's. CO3 7 Marks b) (**OR**) Draw a block diagram of a PLC showing the main functional items and 2. CO1 7 Marks a) how busses link them, explaining the functions of each block. Compare ladder logic diagram and relay ladder diagram with examples. b) CO<sub>2</sub> 7 Marks (UNIT-II) Develop ladder logic diagram for each of the following Boolean 3. a) CO<sub>2</sub> 7 Marks expressions using AND, OR and NOT gates: ii) Y = AB + CD; i) Y = ABC + D; iii)  $Y = (A + B)(\overline{C} + D)$ . Describe in detail about output group register scheme. b) CO3 7 Marks (**OR**) Explain ON delay timer instruction of PLC with timing diagram and CO1 4. 7 Marks a) suitable ladder logic example. In an automatic car parking system entry and exit of a car is detected by CO6 7 Marks b) 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. (UNIT-III) Describe the operation of skip, jump function in PLC. 5. CO5 7 Marks a) Explain about Sweep functions and their application. 7 Marks b) CO5 (**OR**) Describe the number comparison functions. CO4 7 Marks 6. a) With neat ladder diagram an instruction list, show how more than one CO4 7 Marks b) master control relay can be used in a program. UNIT-IV 7. Explain with ladder diagram and the sequence signals of a 4-bit shift CO3 7 Marks a) register. Explain PLC sequencer functions in detail. CO4 b) 7 Marks (**OR**) 8. Describe controlling of three axis robots with PLC. CO6 7 Marks a) Explain the ONE shot (ONS) function with an application. CO3 7 Marks b) UNIT-V 9. Explain the PID control using PLC. CO4 7 Marks a) Explain how the monitor function is made operational and what data and b) CO5 7 Marks functions may be observed. (**OR**) Apply the analog IN PLC function operation to convert into discrete O/P. 10. a) CO5 7 Marks Explain the operation of networking of PLCS. b) CO4 7 Marks
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## III B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations August - 2021

#### **CLOUD COMPUTNG**

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

| Time | : 3 ho | urs                                                                                                                                                                                                        | Max. I | Marks: 70 |
|------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----------|
|      |        | Answer One Question from each Unit<br>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.   |        | <ul> <li>Outline various Cloud-Enabling Technologies <ol> <li>Data Center Technology.</li> <li>Virtualization Technology.</li> <li>Web Technology.</li> <li>Multitenant Technology.</li> </ol> </li> </ul> | 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  |
|      |        | \$P & \$P                                                                                                                                                                                                  |        |           |

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

## AD-HOC AND WIRELESS SENSOR NETWORKS

[Information Technology]

Max. Marks: 70

Time: 3 hours

#### 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<br>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.                   | COI | 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                         | CO2 | 6 Marks    |
| 0.  | )  | protocol for Ad-hoc wireless networks                                                       | 001 | 0 10100110 |
|     |    | i) Hidden and Exposed terminal problems                                                     |     |            |
|     |    | i) Mobility                                                                                 |     |            |
|     |    | iii) Bandwidth Constraint                                                                   |     |            |
|     |    | iv) Error Prone shared broadcast radio channel.                                             |     |            |
|     | 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                      | CO2 | 7 Marks    |
|     |    | initialization phase and route optimization phase.                                          |     |            |
|     |    | (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                       | CO2 | 8 Marks    |
|     |    | protocol for Ad-hoc wireless networks.                                                      |     |            |
|     |    | (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    |
|     | ,  |                                                                                             |     |            |
| 7   | a) | What is the need for energy management in Ad-hoc wireless networks?                         | CO3 | 5 Marks    |
| /.  | h) | Write about various energy conservation schemes for Ad-hoc networks                         | CO3 | 9 Marks    |
|     | 0) | (OR)                                                                                        | 005 | ) marks    |
| 8.  |    | Explain in detail about system power management schemes.                                    | CO4 | 14 Marks   |
|     |    |                                                                                             |     |            |
| 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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## 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  |
|     |    | \$P & \$P                                                                    |     |          |

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## 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

# 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.<br>(OR)                                                         | CO3 | 7 Marks |
| 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.<br>(OR)                                                 | CO1 | 7 Marks |
| 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 |
| 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.<br>(OR)                                               | CO3 | 6 Marks |
| 8.  | a) | Explain DBSCAN clustering algorithm in detail.                                                                               | CO6 | 7 Marks |
|     | b) | Discuss in detail about hierarchical methods of clustering.                                                                  | CO5 | 7 Marks |
| 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.<br>(OR)                                                                | CO2 | 7 Marks |
| 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 |
|     |    | \$ \\$ \\$                                                                                                                   |     |         |

Max. Marks: 70

SVEC-16 Roll No.

## SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### **NETWORK SECURITY**

#### [Computer Science and Systems Engineering]

Time: 3 hours Max. Marks: 70 **Answer One Question from each Unit** All questions carry equal marks UNIT-I Explain Five-Step Program for a successful security strategy with figure. 1. CO1 7 Marks a) Explain why electronic attacks on information systems are easier to make b) CO1 7 Marks than attacks on paper information systems. (**OR**) 2. a) Describe a case study of Business Processes vs. Business Software. CO1 5 Marks Illustrate IP spoofing with relevant figures. CO1 9 Marks b) UNIT-II Why does a packet filtering firewall maintain the state of connections? 3. CO1 7 Marks a) CO<sub>2</sub> 7 Marks b) Examine the differences between VPN types. (OR)4. Explain how to develop firewall configuration. CO1 7 Marks a) What are the requirements are necessary to set up VPN? What are the CO2 7 Marks b) benefits and concerns of using site VPNs? (UNIT-III) 5. Illustrate simplified model of symmetric encryption with relevant figure a) CO<sub>2</sub> 7 Marks along with principles. Explain Cipher block modes of operation in detail. CO<sub>2</sub> 7 Marks b) (**OR**) Illustrate AES encryption and Decryption with figure. 6. CO3 7 Marks a) Describe RC4 algorithm. CO3 b) 7 Marks UNIT-IV Show comparison of SHA parameters and Describe Message digest 7. CO4 7 Marks a) generation using SHA-512. **b**) Explain digital signature with example. CO4 7 Marks (**OR**) Illustrate RSA Public-Key encryption algorithm with example. 8. CO3 7 Marks a) Clarify Message authentication codes in detail. CO4 7 Marks b) UNIT-V 9. Analyse and describe profiles of behavior of intruders and authorized CO5 7 Marks a) users. b) List and describe various types of viruses. CO5 7 Marks (**OR**) 10. Illustrate UNIX Password scheme with figures. CO6 7 Marks a) b) What are worms? Explain with examples. CO5 7 Marks

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

## HUMAN COMPUTER INTERACTION

[Computer Science and Systems Engineering]

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  |

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## SREE VIDYANIKETHAN ENGINEERING COLLEGE

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(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]

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. (OR)                                                                             | CO2        | 7 Marks            |
| 2.  | a)       | Explain different Mobile Application users.                                                                                                                | CO1        | 7 Marks            |
|     | b)       | Write the Hello World first Android application with detailed steps.                                                                                       | CO4        | 7 Marks            |
| 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? (OR)                                                                                 | CO1        | 7 Marks            |
| 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            |
| 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.<br>(OR)                                                                              | CO3        | 7 Marks            |
| 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            |
| 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)<br>b) | What is web service? How to consume the web service in Android OS?<br>Discuss the different ways in which you can send SMS message in your<br>Android App. | CO3<br>CO1 | 7 Marks<br>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. <b>(OR)</b>                                                                     | CO3        | 7 Marks            |
| 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            |

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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

#### **MOBILE COMPUTING**

#### [Computer Science and Engineering]

Max. Marks: 70

SVEC-16

#### 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            |
| 2.  | a)<br>b) | Discuss the Applications and limitations of Mobile computing.<br>Explain security services offered by GSM with relevant Algorithms.                                     | CO1<br>CO1 | 7 Marks<br>7 Marks |
| 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            |
| 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. (OR)                                                                                            | CO1        | 9 Marks            |
| 10. | a)       | Why doesn't WSP/B put responses into the same order as the requests?<br>Analyze the requests for different items on a web page.                                         | CO2        | 7 Marks            |

Elaborate on how to classify Wireless transaction protocol based on CO4 b) 7 Marks Services provided?

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## SREE VIDYANIKETHAN ENGINEERING COLLEGE

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

#### **CRYPTOGRAPHY AND NETWORK SECURITY** [Electronics and Communication Engineering]

| Time | e: 3 ho | urs                                                                                  | Max. | Marks: 70 |
|------|---------|--------------------------------------------------------------------------------------|------|-----------|
|      |         | Answer One Question from each Unit                                                   |      |           |
|      |         | All questions carry equal marks                                                      |      |           |
|      |         |                                                                                      |      |           |
| 1.   | a)      | Draw and explain the models of network security.                                     | CO1  | 7 Marks   |
|      | b)      | Briefly define the monoalphabetic cipher. What is the difference between             | CO4  | 7 Marks   |
|      | ŕ       | a Monoalphabetic cipher and Polyalphabetic cipher?                                   |      |           |
|      |         | (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:                                                                       | CO1  | 14 Marks  |
|      |         | i) Viruses; ii) Worms; iii) Intruders.                                               |      |           |
|      |         | (OR)                                                                                 |      |           |
| 10.  | a)      | Explain about key loggers.                                                           | CO4  | 7 Marks   |
|      | b)      | Explain Firewall design principles.                                                  | CO5  | 7 Marks   |

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#### 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

#### Answer One Question from each Unit

#### All questions carry equal marks

## UNIT-I

1. "Managerial Economics is the discipline which deals with the application CO1 14 Marks of business management". Discuss.

#### (OR)

2. What is elasticity of demand? Explain different types of price elasticity of CO2 14 Marks demand.

## UNIT-II)

3. Define production function. How does a long run production function CO1. 14 Marks differ from short run production function? CO3

#### (OR)

- 4. From the following information calculate:
  - 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 CO1, 14 Marks price of a commodity determined under it? CO2

#### (**OR**)

6. How are price and output determined under monopoly? Show that under CO2 14 Marks monopoly, price is higher and output smaller than under perfect competition.

## UNIT-IV

7. What is Accounting? What are the accounting concepts and conventions? CO1, 14 Marks Explain any two accounting concepts in detail. CO4

#### (OR)

8. From the following transactions write Journal entries into the books of CO3 14 Marks Purohith

| 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   |

CO2 14 Marks

Max. Marks: 70

## UNIT-V

9. Explain the role of computerized accounting system in modern business CO3, 14 Marks organizations. CO4

#### (OR)

10. From the following Trail Balance of Gowham, prepare Trading Account, CO5 14 Marks Profit and Loss Account for year ending 31<sup>st</sup> March 2017 and Balance Sheet as on date.

| 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 |

#### Trail Balance as on 31<sup>st</sup> March, 2017

#### 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%.

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#### **III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021**

#### **MANAGEMENT SCIENCE**

[Electrical and Electronics Engineering, Electronics and Communication Engineering,

Time: 3 hours

#### **Electronics and Instrumentation Engineering**

Max. Marks: 70

7 Marks

7 Marks

CO5

CO3

#### **Answer One Question from each Unit** All questions carry equal marks

#### UNIT-I Discuss in detail the various functions of management. CO3 7 Marks 1. a) b) What are the Social responsibilities of Management? CO1 7 Marks (**OR**) Explain about the elements of corporate planning process. 7 Marks 2. CO<sub>2</sub> a) Elaborate the different types of organizations with examples. b) CO3 7 Marks UNIT-II Describe the principle and types of plant layout. 3. CO<sub>2</sub> 7 Marks a) Describe the concept of ABC analysis in detail. CO2 7 Marks b) (**OR**) What do you mean by work study? Explain the basic procedure involved CO4 4. 14 Marks in method study and work measurement. (UNIT-III) Explain about the Herzberg two factor theory of motivation. 5. CO3 7 Marks a) Explain in detail any four methods of Job evaluation. CO3 7 Marks **b**) (**OR**) Define HRM. Explain the nature and functions of HRM. 6. CO<sub>4</sub> 7 Marks a) Explain the role of merit rating in HRM. 7 Marks b) CO3 (UNIT-IV) What do you understand by Project crashing? 7. a) CO4 7 Marks Explain the differences between entrepreneur and manager. b) CO4 7 Marks (**OR**) 8. Consider a project consisting of nine jobs with the following precedence CO5 14 Marks relations and average time estimates. Predecessor Job Time (Days) 30 А -В 20 \_ С A, B 20 D 20 A.B Е 10 В

G. H 30 I Draw the project network, Identify the critical path and variance.

D, E

C, F

D, E

#### 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

40

20

- 10. Explain about the supply chain management. a)
  - Elaborate the concept of six sigma with examples. b)

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#### **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

#### **Answer One Question from each Unit** All questions carry equal marks

Max. Marks: 70

SVEC-16

## UNIT-I

1. What are the nonliterary sources describing about Indian history and CO1 14 Marks explain briefly about inscriptions and numismatics.

#### (**OR**)

2. Describe the principles of community origination and draw the CO2 14 Marks conclusions from sociological concepts.

## UNIT-II

3. Explain the importance of Great bath in Mohenjodaro and its construction CO1 14 Marks features.

#### (**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 CO2 14 Marks briefly.

#### (**OR**)

How the Moghul empire disappeared in India and write salient feature CO2 6. 14 Marks Akbar ruling?

## UNIT-IV

Explain various steps taken by British to improve the industry sector in CO3 7. 14 Marks India.

#### (**OR**)

8. How Muslims are separated in the war of independence and how they are CO2 14 Marks provoked by Walli?

## UNIT-V

9. What do you mean by social exclusion and explain its importance in CO2 14 Marks Indian context?

#### (**OR**)

14 Marks 10. Communalism and secularism are part of India. Explain. CO2

> (A) <del>(</del> ) <u></u>

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#### 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

> (A) (j) (j)

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

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#### III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

#### PYTHON PROGRAMMING [Information Technology]

Max. Marks: 70

7 Marks

CO1

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

## UNIT-I

- 1. a) Write notes on Python Standard Library.
- Write a simple Python program that prompts the user for a certain CO1. 7 Marks b) number of cities for the Traveling Salesman problem and displays the CO<sub>3</sub> 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. (**OR**) 2. Write a Python program that prompts the user to enter an upper or lower CO1, 7 Marks a) case letter and displays the corresponding Unicode encoding. CO3 Algorithms and computers are a "perfect match". Justify. CO1 7 Marks b) UNIT-II ) 3. Write a brief notes on relational, membership and boolean operators CO1 7 Marks a) along with suitable examples. Write a Python program in which a student enters the number of college CO1-7 Marks b) credits earned. If the number of credits is greater than 90, 'Senior Status' CO3 is displayed; if greater than 60, 'Junior Status' is displayed; if greater than 30, 'Sophomore Status' is displayed; else, 'Freshman Status' is displayed. (**OR**) Create a dictionary named member table that contains users' email 4. CO1-7 Marks a) addresses as keys and their current password as the values. Write a CO3 function that generates a temporary new password for a given user and updates it in the table. Elaborate on dictionaries in Python, Set and Frozenset Types in Python. CO1, 7 Marks b) CO3 UNIT-III) Write a Python function named modCount that is given a positive 5. CO1-7 Marks a) integer, n, and a second positive integer,  $m \le n$ , and returns how many CO3 numbers between 1 and n are evenly divisible by m. Write notes on String Methods in Python. CO1 7 Marks b) (**OR**) 6 Write a python program segment that opens and reads a text file and CO1, 7 Marks a) displays how many lines of text are in the file. CO3 Write a python program segment that reads a text file named CO1. 7 Marks b) original text and displays how many times the letter 'e' occurs. CO3, CO5

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# (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   | CO1, | 7 Marks  |
|     |    | turtle to draw an isosceles triangle on the screen (that is, a triangle with | CO4, |          |
|     |    | two equal-length sides).                                                     | CO5  |          |
|     |    | (OR)                                                                         |      |          |
| 8.  | a) | Describe what it means for a member of a class to be Private and to be       | CO1, | 7 Marks  |
|     |    | Public. How to denote Public and Private Class Members in Python?            | CO3  |          |
|     | b) | Implement a class named AvgList as a subclass of the built-in list class in  | CO1, | 7 Marks  |
|     |    | Python, able to compute the average of a list of numeric values. If the list | CO3- |          |
|     |    | contains any nonnumeric types, a ValueError exception should be raised.      | CO5  |          |
|     |    | UNIT-V                                                                       |      |          |
| 9.  | a) | Briefly Discuss tkinter Extensions.                                          | CO4, | 7 Marks  |
|     |    |                                                                              | CO5  |          |
|     | 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 |
|     |    | \$P & \$P                                                                    |      |          |

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

#### DATABASE MANAGEMENT SYSTEMS

[Electronics and Communication Engineering]

Time: 3 hours

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

### UNIT-I

Differentiate between DDL and DML with examples. CO1 7 Marks 1. a) Discuss different notations used in ER model. Draw ER model for CO1 7 Marks b) university database. (**OR**) 2. Describe different types of users involved in database. CO1 7 Marks a) With a neat diagram, illustrate database architecture. b) CO3 7 Marks UNIT-II ) 3. Consider the following relations for a database that keeps track of CO2 7 Marks a) 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. b) Discuss in detail the operators SELECT, PROJECT and UNION with CO3 7 Marks suitable examples. (**OR**) What is Relational Calculus? Interpret Tuple and Domain Relation CO3 4. 7 Marks a) Calculus. Define Logical database design. Classify the properties of a Relational CO4 7 Marks b) Algebra. (UNIT-III) 5. Consider the table employee (empId, name, department, salary). CO2 7 Marks a) 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. State and explain different Aggregate functions in SQL. CO4 7 Marks b) (**OR**) Define normalization. Explain 1NF, 2NF, 3NF Normal Forms. 6. CO1 7 Marks a) Consider the relation scheme R = (E, F, G, H, I, J, K, L, M, N) and the set CO6 7 Marks b) of functional dependencies:  $\{E, F\} \rightarrow \{G\}, \{F\} \rightarrow \{I,J\}, \{E,H\} \rightarrow \{K,L\}, \{E,H\} \rightarrow \{$  $\{K\} \rightarrow \{M\}, \{L\} \rightarrow \{N\}\}$  on R. What is the minimal key for R?

Max. Marks: 70

SVEC-16

## (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:       | CO4 | 7 Marks |
|    |    | i) Lock-based protocols.                                       |     |         |
|    |    | ii) Time stamp based protocols.                                |     |         |
|    |    |                                                                |     |         |

## UNIT-V

9. Differentiate between clustered and unclustered indexes. CO5 7 Marks a) A PARTS file with Part# as the key field includes records with the CO6 7 Marks b) 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.

#### (**OR**)

10. How can hashing be used to construct an index? Explain. CO5 7 Marks a) Write short notes on Indexed Sequential Access Methods (ISAM). CO1 7 Marks b)

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#### III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

#### **MECHATRONICS**

[Electronics and Instrumentation Engineering]

Max. Marks: 70

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

## UNIT-I

Define the term Mechatronics. Describe the key elements of the CO1 1. 14 Marks Mechatronics System.

(OR)

2. Define the term feedback control system. Describe the characteristics of CO1 14 Marks feedback control system.

|    |    | (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)                                                                                     |     |          |

With the help of ladder diagram, explain the automatic car barrier system. 10. CO5 14 Marks

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Time: 3 hours

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## 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<br>of lists. Try adding a definition list which uses an unordered list to define<br>term                                 | CO1,<br>CO2 | 7 Marks  |
|-----|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|----------|
|     | b) | Create a HTML document that has your image and your friend's image<br>with a specific height and width. Also when clicked on the images it<br>should be navigate to their respective profiles. | CO1,<br>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.                                                                                                                                         | CO2         | 7 Marks  |
|     |    | $1) < \text{font}>. \qquad 11) < \text{meta}>. \qquad 111) . \qquad 1v) < v1deo>.$                                                                                                             |             |          |
|     |    | (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.                                                                                                                                      | CO3         | 8 Marks  |
|     |    | i) Font-size. ii) Font-weight. iii) Text-decoration.                                                                                                                                           |             |          |
|     |    | iv) Text-transform. v) Padding. vi) Border style.                                                                                                                                              |             |          |
|     |    | (OR)                                                                                                                                                                                           |             |          |
| 4.  | a) | Explain the following built-in objects of java Script.                                                                                                                                         | CO3         | 8 Marks  |
|     |    | i) Window. ii) Document.                                                                                                                                                                       |             |          |
|     | 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

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

**III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021** 

### **OBJECT ORIENTED PROGRAMING**

[Electrical and Electronics Engineering]

Time: 3 hours Max. Marks: 70 **Answer One Question from each Unit** All questions carry equal marks UNIT-I Discuss fundamental principles of OOPs with respect to java language. 1. CO1 8 Marks a) Is Java Strongly Typed Language? Discuss. CO1 6 Marks b) (**OR**) Demonstrate various iterative statements in java with suitable examples. CO1, 8 Marks a) CO2 With the help of an example, explain constructor overloading in java. b) CO1 6 Marks UNIT-II ) Explain Creating Packages and Accessing a Package with examples. CO2 7 Marks a) What is inheritance? How inheritance is implemented in java? And CO1, 7 Marks b) discuss the advantages of inheritance. CO3 (**OR**) Define an interface. With an example, discuss how interfaces are CO<sub>2</sub> 8 Marks a) implemented and accessed in java. b) Explain the usage of super keyword with suitable example. CO2 6 Marks UNIT-III) 5. What do understand by Synchronization? Discuss with an example. CO<sub>2</sub> 8 Marks a) Illustrate the creation of user defined exception with an example. CO2 6 Marks b) (OR)Explain inter thread communication with suitable example. CO2 8 Marks a) Explain thread life cycle methods. CO1. 6 Marks b) CO3 UNIT-IV What is the need of layout managers? Explain different types of layout CO4 14 Marks managers available in AWT. (**OR**) Define an applet. Discuss applet life cycle methods with an example. CO<sub>4</sub> 7 Marks a) Write a java program to create single linked list with ten student names CO6 7 Marks b) using LinkedList collection java class. UNIT-V Explain various interfaces and classes available in javax.servlet Package CO5 8 Marks a) Write a java program using listeners for handling mouse events. 6 Marks b) CO5 (**OR**) What is the role of event listeners in event handling? List the Java event 10. CO5 a) 8 Marks listeners with suitable example. Discuss about any four Event Classes. CO5 6 Marks b)

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SVEC-16

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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

 a) Explain in brief about various stages in soil exploration.
 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<sup>3</sup>. Calculate the corrected N value.

#### (OR)

 2. a) Discuss about following samplers. i) Split spoon sampler. ii) Rotary sampler. CO1 7 Marks CO1 7 Marks CO1 7 Marks

## UNIT-II

- 3. a) With an aid of neat sketch, explain how active earth pressure condition CO1 8 Marks can be determined using Culmann's graphical method.
  - b) A retaining wall, 5m high supports a backfill ( $c = 20 \text{kN/m}^2$ ,  $\Phi = 28^\circ$ , CO2 6 Marks  $\gamma = 21 \text{kN/m}^3$ ) with horizontal surface. The backfill carries surcharge load of  $25 \text{kN/m}^2$ . If the wall pushed towards backfill, compute the total thrust acting on retaining wall.

#### (**OR**)

- 4. a) What are assumptions of Coulomb's earth pressure theory? Give out the CO1 6 Marks analytical equation for determined the coefficient of active earth pressure using this theory.
  - b) A retaining wall with a smooth vertical back is 8m high and retains a CO2 8 Marks 2-layer sand backfill each having a depth of 4 m. For top layer  $\Phi' = 30^{0}$  and  $\gamma = 19$ kN/m<sup>3</sup> and for bottom layer  $\Phi' = 32^{0}$  and  $\gamma = 20$ kN/m<sup>3</sup>. Calculate the active thrust acting per meter run on the retaining wall. Show active earth pressure distribution.

## (UNIT-III)

- 5. a) Derive an equation for find out the stability of infinite slopes in cohesion- CO2 6 Marks less soil for steady seepage condition.
  - b) A 7m deep canal has side slope of 1:1. The soil has  $C_u = 20 \text{kN/m}^2$ , CO2 8 Marks  $\Phi_u=10^0$ , 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<sub>n</sub>=0.11

For 
$$\Phi_{u} = 4.81^{\circ}$$
, slope 1:1, take S<sub>n</sub>=0.135.

#### (OR)

- 6. a) Explain about Swedish Circle method for slope stability analysis of finite CO2 8 Marks slopes.
  - b) An embankment of height 10m and slope with an inclination of  $40^{\circ}$  was CO2 6 Marks made with soil having c' = 25kN/m<sup>2</sup>,  $\phi = 28^{\circ}$ ,  $\gamma = 18$ kN/m<sup>3</sup>. Determine the critical height of the infinite slope for fully submerged condition and write a comment on stability of embankment.

## UNIT-IV

- 7. Mention the Terzaghi's bearing capacity equation. What are the major CO2 7 Marks a) assumptions made in the Terzaghi's bearing capacity theory? For a square footing that is B x B in plan, the following are given: CO2 7 Marks b)  $D_f = 1m$ ; vertical gross allowable load  $Q_{all} = 665kN$ ;  $\gamma = 18kN/m^3$ ;  $\Phi' = 40^0$ ; C' = 0; and factor of safety = 3; determine the size of the footing. (**OR**) 8. Give out equations for determining allowable bearing pressure from CO1 8 Marks a) following methods. i) Teng's Method. ii) Peck Method. iii) As per IS 6403-1971. iv) Bowle's method. A circular footing of size 2.5m rests on soil having  $c= 20 \text{kN/m}^2$ ,  $\Phi = 25^{\circ}$  CO2 6 Marks b) and  $\gamma = 17.5$  kN/m<sup>3</sup>. 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  $\phi = 25^{\circ}$ , N<sub>c</sub>= 25.1, N<sub>g</sub>= 12.72 and N<sub>y</sub> = 8.34) UNIT-V 9. Classify the types of pile foundation based on: CO1 a) 8 Marks i) Material used. ii) Method of installation. iii) Mode of load transfer. iv) Displacement. A group of 16 bored pile are installed in clayey soil having unconfined b) CO2 6 Marks compression strength,  $q_u = 60 \text{kN/m}^2$  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  $\alpha$  = 0.7. (**OR**)
- a) Discuss in detail about various components of well foundations.
   b) Explain about pneumatic caisson with the help of neat sketch.
   CO1 8 Marks
   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 3 <sup>rd</sup> road development plan? How do you determine road lengths by 3 <sup>rd</sup> 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 <sup>3</sup> . Assume Max. Temperature differential during day to be $0.6^{\circ}$ C per cm slab thickness (for warping stress at interior and edge) and max temp. Differential of $0.4^{\circ}$ C per slab thickness during night (for warping stress at the corner). Additional data given. | CO2 | 7 Marks |
|    |    | Cy = 0.54)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |         |
|    | 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<br>in detail home questionnaire survey.                                                                                                                                                                                                                                                                                                                                                                                                                  | CO8 | 7 Marks |

- 8. a) Explain the various factors that affect the level of service. Explain the CO7 7 Marks different types of level of service.
  - b) A test car was used on a north-south road 0.75 km long and the following CO6 7 Marks data given below was collected for the moving car was collected. Calculate traffic volume, average travel time and space mean speeds in both directions.

| North trip<br>no. | Travel Time<br>(along) in<br>min | No. of<br>vehicles met<br>Against | No of<br>vehicles<br>overtaking<br>test car | No of<br>vehicles<br>overtaken<br>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<br>no. | Travel Time<br>(along) in<br>min | No. of<br>vehicles met<br>Against | No of<br>vehicles<br>overtaking<br>test car | No of<br>vehicles<br>overtaken<br>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                                             |  |
|                   |                                  |                                   | V                                           |                                               |  |

## 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 CO7 7 Marks mention the concerned preventive measures.
  - b) Draw a neat sketch of rotary intersection, show all design components and CO7 7 Marks explain about them in brief.

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#### **III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021**

#### STEEL STRUCTURES [Civil Engineering]

Time: 3 hours

#### 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 CO2 14 Marks 12mm thick gusset plate at site. Design welds to transmit load equal to the design strength of the member. Assume Fe 410 grade steel.

#### (**OR**)

2. Design a single bolted double cover butt joint to connect boiler plates of CO3 14 Marks 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.

### UNIT-II

3. Design a laterally supported beam of effective span 6 m for the following CO3 14 Marks data:

Grade of steel: Fe 410; Maximum bending moment: 160 kNm; Maximum shear force: 220 kN. Check for deflection is not required.

#### (OR)

- 4. A steel floor beam in a building has a span of 6m. It is simply supported CO2 14 Marks 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.

## UNIT-III)

5. Select a suitable angle section to carry a factored tensile force of 180 kN CO5 14 Marks assuming a single row of M20 bolts and assuming design strength as fy = 250 MPa.

#### (OR)

6. A double angle discontinuous strut 2.25m long consists of two CO7 14 Marks 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.

#### (UNIT-IV)

 Design a laced column 10m long to carry a factored axial load of 1100kN. CO3 14 Marks 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.

#### (OR)

8. A column ISHB 350 at 661.2 N/m carries an axial compressive factored CO3 14 Marks load of 1600kN. Design a suitable welded gusset base. The base rests on M-15 grade of concrete.

Max. Marks: 70

## UNIT-V

9. By using IS Codes, determine the design loads on the purlins of an CO7 14 Marks industrial building near Visakhapatnam: 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:          | $\theta$ less than 3°.         |
| Permeability:        | Medium                         |
| Span of truss:       | 15 m.                          |
| Pitch:               | 1/5.                           |
| Sheeting of purlins: | 1 <b>.</b> 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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III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

**GROUNDWATER DEVELOPMENT AND MANAGEMENT** 

[Civil Engineering]

Time: 3 hours

Max. Marks: 70

## Answer One Question from each Unit

## All questions carry equal marks

## UNIT-I

| 1.  | a) | Explain vertical distribution of groundwater with a neat sketch.                                                                                                                                                                                                                 | CO1 | 7 Marks  |
|-----|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----------|
|     | b) | Discuss various geological formations of aquifers with suitable examples.                                                                                                                                                                                                        | CO1 | 7 Marks  |
|     |    | (OR)                                                                                                                                                                                                                                                                             |     |          |
| 2.  |    | Describe Groundwater flow contours and their applications with respect to flownet analysis.                                                                                                                                                                                      | CO2 | 14 Marks |
|     |    | UNIT-II)                                                                                                                                                                                                                                                                         |     |          |
| 3.  | a) | Explain unconfined aquifer with a neat sketch.                                                                                                                                                                                                                                   | CO2 | 6 Marks  |
|     | b) | In an artesian aquifer, the drawdown is 1.2 meters at a radial distance of 10 meters from a well after two hours of pumping. On the basis of Thies, non-equilibrium equations, determine the pumping time for the same drawdown at a radial distance of 30 meters from the well. | CO2 | 8 Marks  |
|     |    | (OR)                                                                                                                                                                                                                                                                             |     |          |
| 4.  | a) | Derive an expression to determine the discharge through unconfined aquifer using Dupit's equation.                                                                                                                                                                               | CO3 | 7 Marks  |
|     | b) | A well is located in a 30m thick confined aquifer of permeability 35m per day and storage coefficient of 0.004. If the well is pumped at a rate of 1500 litres per minute, calculate the drawdown at a distance of 40m from the well after 20 hours of pumping.                  | CO3 | 7 Marks  |
|     |    | UNIT-III                                                                                                                                                                                                                                                                         |     |          |
| 5.  |    | Describe the shape of fresh salt water interface.                                                                                                                                                                                                                                | CO6 | 14 Marks |
|     |    | (OR)                                                                                                                                                                                                                                                                             |     |          |
| 6.  |    | Explain the structure of the fresh salt water interface.                                                                                                                                                                                                                         | CO6 | 14 Marks |
|     |    | UNIT-IV                                                                                                                                                                                                                                                                          |     |          |
| 7.  | a) | Explain the advantages and disadvantages artificial recharge of groundwater.                                                                                                                                                                                                     | CO5 | 7 Marks  |
|     | b) | List artificial recharge methods and explain stream channel method with a neat sketch.                                                                                                                                                                                           | CO5 | 7 Marks  |
|     |    | (OR)                                                                                                                                                                                                                                                                             |     |          |
| 8.  |    | Describe the application of Remote Sensing in artificial recharge of groundwater along with a case study.                                                                                                                                                                        | CO4 | 14 Marks |
|     |    | UNIT-V                                                                                                                                                                                                                                                                           |     |          |
| 9.  |    | List surface methods in groundwater exploration and explain seismic refraction method with a neat sketch.                                                                                                                                                                        | CO4 | 14 Marks |
|     |    | (OR)                                                                                                                                                                                                                                                                             |     |          |
| 10. |    | List the types of information that can be obtained from various logging techniques.                                                                                                                                                                                              | CO7 | 14 Marks |

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**III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021** 

#### SOLID WASTE MANAGEMENT [Civil Engineering]

Time: 3 hours

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

## UNIT-I

1. Describe the effects of improper disposal of solid waste on human health CO6 7 Marks a) and environment. Explain the factors influencing solid waste generation. CO<sub>2</sub> 7 Marks b) (**OR**) 2. Write about the interrelationship of the functional elements in a solid CO4 14 Marks waste management system. UNIT-II Compose the impacts of public health and economic aspects of on-site CO6 3. 7 Marks a) solid waste storage system. Explain the factors that should be considered in evaluating onsite CO1 b) 7 Marks processing equipment. (**OR**) 4. Describe on-site segregation and handling of solid waste. CO9 14 Marks (UNIT-III) Discuss the methods adopted in India for collection and disposal of CO7 5. 14 Marks refuse. What changes would you recommend in these, so as to make the process more hygienic and aesthetic? (**OR**) 6. Describe the operation of hauled container system of waste collection. CO1 7 Marks a) Assess the various methods of house to house solid waste collection and CO2 7 Marks b) their advantage. UNIT-IV) 7. Describe the mechanical methods of volume reduction of solid waste. CO<sub>2</sub> a) 7 Marks Write short note on air pollution problems in incineration process and b) CO8 7 Marks suggest which act should be followed for safety implementation of incineration process. (**OR**) 8. Explain composting process of bio-degradable municipal solid waste. CO5 14 Marks ( UNIT-V ) 9. Write short note on environmental factors in sanitary landfill sites. CO1 7 Marks a) Explain different methods used for municipal solid waste on land. CO1 b) 7 Marks (**OR**) What is leachate? Design various methods for treatment and disposal of CO3 10. 14 Marks lleachate. <u></u>

Max. Marks: 70

#### 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]

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)<br>b)                                                       | Define vulnerability and discuss the process of vulnerability analysis.<br>Write a short note on major initiatives for disaster preparedness in India.                                                    | CO1<br>CO5 | 7 Marks<br>7 Marks |
|     |                                                                |                                                                                                                                                                                                           |            |                    |
| 3.  | a)<br>b)                                                       | What are the guidelines for preparation of disaster management plans?<br>List a few of the prominent earthquakes which occurred in India in last<br>two decades and what are the lessons leant from them. | CO1<br>CO6 | 7 Marks<br>7 Marks |
| 4   | a)                                                             | Explain the terms:                                                                                                                                                                                        | CO1        | 7 Marks            |
| ••  | u)                                                             | i) Epicentre. ii) Hypocentre. iii) Fault plane.                                                                                                                                                           | 001        | / 101u1K5          |
|     | 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            |
| 6   | a)                                                             | Explain the classification of drought                                                                                                                                                                     | CO2        | 7 Marks            |
| 0.  | 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            |
| 8.  |                                                                | Briefly explain the structural and non-structural mitigation measures for landslides.                                                                                                                     | CO1        | 14 Marks           |
|     |                                                                |                                                                                                                                                                                                           |            |                    |
| 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)<br>b)                                                       | Make an overview of recent trends in disaster management.<br>What are the objectives of National Disaster Management Plan (NDMP)?                                                                         | CO5<br>CO1 | 7 Marks<br>7 Marks |
|     | <i>c</i> )                                                     |                                                                                                                                                                                                           | 0.01       | , 1,141110         |

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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

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

## UNIT-I

- Ramu wants to construct an own house by taking loan from the bank CO1 1. a) 7 Marks through government schemes. List the schemes that are associated with housing and explain them. What are the safety issues that have to be taken while transferring any 7 Marks b) CO5 documents? (**OR**) 2. List out and explain the different ways how you will eradicate poverty. CO1 7 Marks a) Examine the role of financial institutions in rural development with CO4 7 Marks b) special emphasis on NABARD. UNIT-II ) What is meant by non-conventional energy? Mudipatla is a village having CO1 3. 14 Marks problem with electricity. Explain how it helps to prevent power deficiency problems in rural areas. (**OR**) What do you understand by 3R principle? How this can be useful for the CO4 4. 7 Marks a) rural people for the waste management? Explain in detail the production of biomass with the waste available in the CO1 b) 7 Marks village areas. (UNIT-III) 5. Enumerate the technologies involved in food processing units in detail. CO4 7 Marks a) Elaborate the role of cottage industry in rural development. CO1 7 Marks b) (**OR**) 6. What is plant tissue culture? How plant tissue culture is carried out in the CO2 14 Marks laboratory? (UNIT-IV) Suggest the rural people to construct various rainwater harvesting CO4 7. 7 Marks a) structures to store and to increasing the groundwater levels. What are the problems associated with poor water quality? Address the CO5 7 Marks b) issues that are involved in environment and sanitation. (**OR**) Educate the use of bio fertilizers to the rural people with the resources 8. CO6 14 Marks available in the rural area. What are the disadvantages of using chemical fertilizers? UNIT-V Explain how ICT are helpful to the rural people. List some of the ICT CO1 9. 14 Marks applications which are used in rural areas. (**OR**)
- 10. Carryout feasibility study on the public and private partnership for rural CO3 14 Marks development. Suggest the government in various ways how the village can be developed under adoption scheme.

Max. Marks: 70

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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 <b>a</b> and <b>b</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 <b>a</b> , <b>b</b> , <b>c</b> and <b>d</b> 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 $3-\Phi$ 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 CO4 7 Marks separately excited DC motor.
  - b) Explain with circuit and waveforms of four quadrant chopper fed CO2 7 Marks separately excited DC motor.

## UNIT-IV

- 7. a) Illustrate the stator frequency control of induction motor with torque and CO5 7 Marks power limitations in real time applications.
  - b) Show that variable frequency control of induction motor is more efficient CO1 7 Marks than stator voltage control.

#### (OR)

- 8. a) Explain closed loop operation of CSI fed induction motor drives with a CO4 7 Marks neat diagram.
  - b) Explain static Scherbius drive control for speed control of induction CO2 7 Marks motor. Draw speed -torque characteristics

## UNIT-V

- 9. a) Describe the advantages of self-controlled variable speed synchronous CO1 6 Marks motor drive over the separate controlled drive.
  - b) In variable frequency control of a synchronous motor why (V/f) ratio is CO6 8 Marks maintained constant up to base speed and V constant above the base speed. Explain briefly with necessary waveforms.

#### (OR)

- 10. a) Explain the operation of self controlled synchronous motor fed by voltage CO4 7 Marks source inverter with a neat diagram.
  - b) Briefly explain the various drive circuits for stepper motor. CO5 7 Marks

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

#### **POWER SYSTEM ANALYSIS** [Electrical and Electronics Engineering]

Max. Marks: 70

5 Marks

CO1

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



- 1. a) List the advantages of the p.u form of representation.
  - 9 Marks CO3 b) Obtain the per unit representation for the three-phase power system shown in figure



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. CO2 7 Marks 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.

## UNIT-II

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

CO3 7 Marks



Derive an expression for adding a branch element between two buses in the CO5 7 Marks b) Z<sub>BUS</sub> building algorithm.

(**OR**)

Time: 3 hours

4. For the system shown below, Obtain Y<sub>BUS</sub> by direct inspection method. Take CO4 9 Marks a) bus (1) as reference. The element impedances are indicated in p.u.



CO1 b) List the merits and demerits of Z<sub>BUS</sub> building algorithm.

#### UNIT-III)

5 Marks

- 5. Derive the generalized expressions for elements of Jacobian matrix for CO5 7 Marks a) decoupled load method.
  - Compare Gauss-Seidel method and Newton-Raphson method of load flow CO1 b) 7 Marks studies

#### (**OR**)

6. Explain clearly with detailed flowchart, the computational procedure for 14 CO5 load flow solution using N-R method when the system contains all types of Marks buses.

## UNIT-IV)

- 7. Illustrate the step by step procedure for systematic fault analysis using bus CO<sub>4</sub> 7 Marks a) impedance matrix.
  - CO1 b) What do you understand by short-circuit KVA? Explain. 7 Marks

#### (**OR**)

- 8. The short circuit MVA at the bus bars for a power plant A is 1200 MVA and CO3 7 Marks a) 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 Zf.

## UNIT-V

- 9. Derive the swing equation for a single machine connected to infinite bus CO<sub>4</sub> 7 Marks a) system. State the assumptions if any and state the usefulness of this equation. Neglect the damping.
  - CO1 Describe the methods of improving transient stability. 7 Marks b)

#### (**OR**)

- 10. State the bad effects of instability. Distinguish between steady state and CO1 7 Marks a) dynamic stability.
  - Explain critical clearing time and critical clearing angle, deriving the CO4 7 Marks b) expressions.

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#### 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 CO3 7 Marks mention advantages and disadvantages.
  - 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 CO2 14 Marks 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.



- 3. a) A 11kv line is to be erected to give supply to village 2km from existing CO1 7 Marks 11kv line. Prepare a schedule of materials required for the line. Assume an average span of 50m and 2 cut points in line.
  - b) Calculate the number of various insulators needed for the erection of CO3 7 Marks 500m, 3-phase, 11kv overhead line with two angled points and two turning points. The length of span is 70m.

#### (OR)

4. An OH 11kv, 50Hz, 3-phase line is to be tapped off from the existing CO3. 14 Marks 11kv line pole at about 90<sup>o</sup> angle. The proposed line has to be erected on 10m long RCC poles with ACSR conductor of size  $6/1 \times 2.11$ mm 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.

# UNIT-III

- Categorize the power circuits on the basis of applications and explain. 5. CO5 7 Marks a) b) What are the advantages of Electric drives? CO4 7 Marks (**OR**) Calculate the size of the conductor to be used for wiring of 15HP, 400V, 6. CO4 7 Marks a) 3-phase, 50Hz Induction motor. Consider the efficiency and power factor of motor as 0.85 and 0.8 respectively.
  - b) State some important points that guides in carrying out wiring for a motor CO1 7 Marks installation.

# 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                 | CO5 | 7 Marks |  |  |  |  |
|     |      | diagram. Mention its uses.                                                         |     |         |  |  |  |  |
|     |      | (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 |  |  |  |  |

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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

8.

Max. Marks: 70

2 Marks

CO1

#### 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 CO2 12 Marks or nonlinear, causal or non-causal and stable or not.

i) 
$$y(n) = x(n) + x^2 (n-1)$$
.  
ii)  $y(n) = ax(n) + bx(n-1)$ .  
iii)  $y(n) = |x(n)|$ 

b) List out the basic operations on discrete time signals.

#### (OR)

- 2. a) Discuss sampling and quantization methods in A/D conversion process in CO1 8 Marks detail.
  - b) Determine the solution of difference equation CO1 6 Marks  $y(n) = \frac{5}{6}y(n-1) - \frac{1}{6}y(n-2) + x(n) \text{ for the input } x(n) = 2^n u(n) \cdot$

## 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 CO4 10 Marks algorithm.

#### (OR)

4. What is the advantage of FFT? Discuss decimation in time and CO1 14 Marks decimation in frequency algorithms in detail.

### (UNIT-III)

5. Design a digital IIR low pass filter with pass band edge of 1000Hz and CO3 14 Marks 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.

#### (**OR**)

- 6. a) What is warping effect? What is its effect on magnitude and phase CO1 6 Marks response?
  - b) Convert the given analog filter with system function  $H(s) = \frac{1}{(s+3)(s+4)}$  CO3 8 Marks

into a digital filter using impulse invariant method assuming T=1s.

# UNIT-IV

7. a) Discuss the Fourier series method of designing FIR filters in detail.b) What are the advantages and disadvantages of FIR filters?CO1 6 Marks

(OR)

# Design an ideal lowpass filter with a frequency response CO3 14 Marks $H_d(e^{jw}) = 1$ for $-\frac{\pi}{2} \le \omega \le \frac{\pi}{2} = 0$ for $\frac{\pi}{2} \le |\omega| \le \pi$

Find the values of h(n) for N=11.

Find H(Z) using Fourier series method.

# UNIT-V

9. Implement the process of controlling stepper motor using TMSLF2407 CO5 14 Marks DSP controller in robotics.

### (OR)

10. Develop an algorithm by interfacing TMSLF2407 processor with stepper CO6 14 Marks motor drive system for controlling its speed.

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#### **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. Explain various factors affecting the choice of the specific magnetic CO1 a) 7 Marks loading on a machine while designing. A 350kW, 500V, 450 RPM, 6 pole DC generator is built with an armature b) CO<sub>2</sub> 7 Marks 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. (**OR**) 2. List the classes of electrical conducting materials and describe their CO1 7 Marks a) properties and applications of those materials. Classify the insulating materials used in electrical machines according to 7 Marks b) CO1 their thermal stability. Comment on selection of class of insulating material. UNIT-II Select and explain suitable procedure for designing the series field of DC CO3 3. 8 Marks a) machine. Derive formula for air gap length of DC machine. CO<sub>2</sub> 6 Marks b) (**OR**) 4. List the guiding factors for selecting the armature slots. CO1 6 Marks a) Calculate the mmf required for air gap of a DC machine with an axial b) CO4 8 Marks 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. (UNIT-III) 5. Give the relationship between emf per turn and kVA rating of a CO1 6 Marks a) transformer. The tank of 1250 kVA, natural oil cooled transformer has the dimensions CO4 8 Marks b) 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 =  $6 \text{ W/m}^{2} \text{ }^{\circ}\text{C}$ , loss dissipation due to convection=6.5 W/m<sup>2</sup> <sup>0</sup>C, improvement in convection due to provision of tubes = 40%, temperature rise =  $40^{\circ}$ 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. (**OR**) 6. Derive the output equation of single phase transformer. CO2 7 Marks a) A 3-Phase, 50Hz, oil cooled core type transformer has the following CO4 7 Marks b) dimensions: Distance between core centres = 0.2m, Height of window
  - 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<sup>2</sup>, The current density in the conductor = 2.5A/mm<sup>2</sup>. 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.

#### 1

# UNIT-IV

- 7. a) State and discuss the factors to be considered while determining the air CO1 7 Marks gap in case of 3-phase induction motors.
  - b) Determine the approximate diameter and length of stator core for a 10kW, CO4 7 Marks 415V, 3-phase, 4 pole, 1425 RPM, delta connected induction motor. Bav = 0.45Wb/m<sup>2</sup>, ac = 2300 amp. cond./m, full load efficiency = 0.85, Power factor = 0.88. Assume (L/ $\tau$ ) value is unity.

#### (OR)

8. Estimate the stator core dimensions number if stator slots and number of CO4 14 Marks stator conductors per slot for a 100kW, 3300V, 50Hz, 12 pole, star connected slip ring induction motor. Bav = 0.4Wb/m<sup>2</sup>, 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.

### 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, CO4 7 Marks 500 RPM, 3-phase alternator by assuming average gap density as 0.6 Wb/m<sup>2</sup> and specific electric loading of 30000 amp. cond./m. take (L/τ) value as 1.5.

#### (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 CO5 7 Marks of synchronous machine.

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# SPECIAL ELECTRICAL MACHINES

[Electrical and Electronics Engineering]

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 CO1 9 Marks reluctance stepper motor with 4/2 poles.
  - 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 CO1 4 Marks motor?
  - b) Show the rotor positions of a 4-phase VR stepper motor with 6 rotor teeth CO2 10 Marks when it rotates in a counter clockwise direction. Assume two-phase ON mode of excitation of phase windings.

### UNIT-II

- 3. a) What is the need for sensing the rotor position of a SRM? Discuss in CO1 7 Marks detail how an optical position sensor works.
  - b) Sketch the variation of inductance with rotor position of a three phase CO2 7 Marks switched reluctance motor by ignoring fringing and saturation effects.

#### (**OR**)

- 4. a) Show that the torque developed in a switched reluctance motor is CO1 7 Marks independent of the direction of the current.
  - 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 CO2 7 Marks a load angle of 45<sup>o</sup>.
  - b) A 3-phase, 4 pole, 60Hz, 230V star connected synchronous reluctance CO4 7 Marks motor has direct axis and quadrature axis synchronous reactances of 22.5 $\Omega$  and 3.5 $\Omega$  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.

#### (**OR**)

- 6. a) Sketch the rotor structure of a line start synchronous reluctance motor and CO1 10 Marks explain why these type of motors are self starting.
  - b) Discuss how SyRM are effectively employed in industrial applications. CO6 4 Marks

#### Time: 3 hours

# UNIT-IV

- 7. a) A permanent magnet DC motor has an armature resistance of 1.03Ω. It CO4 7 Marks 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.
  - b) Sketch the drive circuit for a three phase BLDC motor and explain how CO2 7 Marks rotation is achieved in clockwise and anticlockwise directions.

#### (OR)

- 8. a) What are the disadvantages of sensor based control of BLDC motor? CO1 7 Marks Explain how sensor-less control will overcome these disadvantages with the help of a block diagram.
  - b) Explain in detail sensing and switching logic schemes of PMBLDC CO1 7 Marks motor.

### UNIT-V

- 9. a) Explain how a linear induction motor is developed from a cylindrical CO1 7 Marks rotor induction motor. Why the stator and rotor of equal lengths cannot move continuously? What modifications can be made to achieve propulsion force continuously?
  - b) Discuss how a double sided Linear induction motor is used in electric CO6 7 Marks traction with the help of a neat schematic diagram.

#### (**OR**)

- 10. a) Analyze the magnetic fields and forces within the air gap of a short- CO2 7 Marks primary long-secondary Double Sided Linear Induction Motor (DSLIM).
  - b) Derive the expression for the thrust of linear force developed in a linear CO1 7 Marks induction motor.

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### SREE VIDYANIKETHAN ENGINEERING COLLEGE

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

### CAD / CAM

### [Mechanical Engineering]

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,<br>CO3 | 6 Marks |
|    | b) | Derive and write the general 2-D transformation matrices for Rotation,<br>Reflection and Scaling transformations.      | CO1,<br>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 |
|    |    |                                                                                                                        |             |         |

Time: 3 hours

# UNIT-V

- 9. a) Describe in detail about the benefits of CIM.
  - b) Explain the concept Rapid prototyping procedure with a neat schematic CO6 8 Marks diagram.

CO6

6 Marks

# (OR)

- 10. a) Write in detail about the computer aided testing of parts produced by CO6 7 Marks CIM process.
  - b) Distinguish between Contact and Non-contact Inspection methods. CO6 7 Marks

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#### 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 CO1 7 Marks from each other?
  - b) Super heated steam at an average temperature of  $200^{\circ}$ C is transported CO2, 7 Marks through a steel pipe (K = 50 w/m. K, D<sub>0</sub> = 8 cm, D<sub>i</sub> = 6 cm and L = 20m). CO5 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  $10^{\circ}$ C. The steam and air heat transfer coefficients are estimated to be 800 and 200W/m<sup>2</sup>K 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.

#### (OR)

- 2. a) Derive general three dimensional conduction equation for Rectangular CO1 7 Marks co-ordinate system and deduce from it equation applicable 1-Dimensional steady state heat transfer with heat generation.
  - b) Calculate the rate of heat flow per m<sup>2</sup> through a furnace wall consisting CO2, 7 Marks 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<sup>2</sup> °C and the outer surface temperature is 70°C. The temperature of the gases inside the furnace is 1670°C. What temperatures prevail at the inner and outer surface of the centre layer?
    - Take:  $K_{chromebrick} = 1.25 \text{ W/m}^{0}\text{C}$ ,  $K_{Kaolinbrick} = 0.074 \text{ W/m}^{0}\text{C}$  $K_{masonrybrick} = 0.555 \text{ W/m}^{0}\text{C}$

Assume steady heat flow.

# UNIT-II

- 3. a) Derive an expression for temperature distribution and for heat transfer CO2 7 Marks rate in the case of short fin with end insulated case.
  - b) Consider a very long rectangular fin attached to a flat surface such that CO5, 7 Marks the temperature at the end of the fin is essentially that of the surrounding CO4 air, i.e  $20^{\circ}$ C. Its width is 5cm; thickness is 1mm, thermal conductivity is 200W/m.K and base temperature is  $40^{\circ}$ C. The heat transfer coefficient is 20W/m<sup>2</sup>K. Estimate the fin temperature at a distance of 5cm from the base and the rate of heat loss from the entire fin.

#### (OR)

- 4. a) What is meant by Lumped system analysis? Derive the expression for CO2, 7 Marks temperature distribution in a body with respect to time variation. CO3
  - b) An aluminium sphere weighing 5.5 kg and initially at a temperature of CO5 7 Marks 290°C is suddenly immersed in a fluid at 15°C. The convective heat transfer coefficient is 58W/m²K. Estimate the time required to cool the aluminium sphere to 95°C, using lumped capacity method of analysis. Also determine the temperature attained by the sphere after 30 min.

### (UNIT-III)

- 5. a) Using dimensional analysis, obtain the general form of equation for CO2 7 Marks natural convective heat transfer.
  - b) Air at 20<sup>°</sup>C flows along a heated plate at 134<sup>°</sup>C with a velocity of 3 m/s. CO4 7 Marks 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<sup>°</sup>C may be taken as 15.06 x 10<sup>-6</sup>m<sup>2</sup>/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.

#### (OR)

- 6. a) Explain the mechanism of heat flow by natural convection and define CO1 7 Marks Grashoff number and explain its significance in Natural convection heat transfer.
  - b) A 30cm long glass plate is hung vertically in the air at 2°C while its CO4 7 Marks temperature maintained at 77°C. 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.

# 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 CO4 7 Marks pipe heat exchanger. It enters at 360°C and leaves at 300°C. Cold fluid enters at 30°C and leaves at 26°C. If the overall heat transfer coefficient is 800 W/m2K, determine the heat exchanger area required for:

i) Parallel flow. ii) Counter flow.

### (OR)

- 8. a) Explain various regimes in boiling heat transfer and distinguish between CO1 7 Marks filmwise and and dropwise condensation.
  - b) A heated polished copper plate is immersed in a pool of water boiling at CO4 7 Marks atmosphere pressure. If the surface temperature of copper plate is maintained at a temperature of 113°C, determine the surface heat flux and the evaporation rate per unit area of the plate.

# 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<sup>2</sup> has an effective temperature CO2, 7 Marks 800K. Determine the following.
  - i) Total emission.
  - ii) Intensity of radiation.
  - iii) Wavelength for maximum spectral emissive power.

### (OR)

- 10. a) Using the definition of radiosity and irradiation, deduce an expression for CO1 7 Marks the radiation interchange between two grey bodies.
  - b) Two large parallel planes with emissivities 0.4 are maintained at different CO2, 7 Marks temperatures exchange heat only by radiation. What percentage change in CO4 net radiation heat transfer would occur, if two equally large radiation shields with surface emissivities 0.04 are introduced in parallel to the plates?



### 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]

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;                                                                              | CO3 | 14 Marks |
|    |    | i) Solar Ponds. ii) Solar Desalination.                                                                     |     |          |
|    |    | iii) I-V curves of a PV Cell. iv) Thermoelectric power.                                                     |     |          |
|    |    | 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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### III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

### HYDRAULICS AND PNEUMATICS

#### [Mechanical Engineering]

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.<br>i) Meter-in circuit.                                                                                      | CO1 | 10 Marks |
|     |    | ii) Meter-out circuit.                                                                                                                                          |     |          |
|     |    | 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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Time: 3 hours

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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 CO2 7 Marks firm? List any two supply chain decisions that have a significant impact on supply chain profitability.

#### (OR)

- 2. a) Explain the basic trade-off between responsiveness and efficiency for CO1 7 Marks each of the major drivers of supply chain performance.
  - b) Discuss the major obstacles that must be overcome to manage a supply CO1 7 Marks chain successfully.

## UNIT-II

- 3. a) How do firms determine the optimum level of cycle stock in a chain? CO4 7 Marks Discuss with a real world example.
  - b) What happened to the current inventory levels as we move backward, up CO1 7 Marks the supply chain from retailer to manufacturer? Why?

#### (OR)

- 4. a) What is bullwhip effect and what are the main causes of bullwhip effect? CO2 7 Marks What can a firm do to minimize demand distortions across the chain?
  - b) How could industrial supplies distributor use information to increase its CO3 7 Marks responsiveness?

## UNIT-III)

- 5. a) Explain the main transportation strategies used by the firms. How to CO1 7 Marks choose the optimum transportation strategy?
  - b) Discuss key drivers that may be used to tailor transportation. How does CO2 7 Marks tailoring help?

### (OR)

- 6. a) Explain why achieving strategic fit is critical to company's overall CO2 7 Marks success.
  - 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 CO2 7 Marks program? What kind of companywide cooperation is required for a successful mass customization program?
  - b) Explain the parameters to be considered in integrating supplies into new CO3 7 Marks product development.

### (OR)

- 8. a) What are the key challenges in adapting information technology to CO5 7 Marks improve the efficiency of supply chain?
  - b) Why is IT the key component of SCM system? "Successful CO2 7 Marks IT implementation is the outgrowth of the participation of knowledge workers". Comment with examples.

## UNIT-V

- 9. a) What are the global issues in SCM? Discuss them by giving an account to CO1 7 Marks cross border trade.
  - 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 CO3 7 Marks context of Indian industries perspective.
  - b) What do you understood by Mass Customization? Describe with CO2 7 Marks advantages and limitations.

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#### III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

#### ANTENNAS AND WAVEGUIDES

[Electronics and Communication Engineering]

Time: 3 hours

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

## 

- 1. a) Obtain the expression for characteristic impedance of a rectangular CO1 9 Marks waveguide for TE mode of propagation.
  - b) A rectangular waveguide has a dimension of a = 22.86mm. Calculate the CO1 5 Marks b dimension such that cut-off wavelength of  $TE_{11}$  mode is half that of  $TE_{10}$  mode.

#### (OR)

- 2. a) Derive the expressions for cut-off frequency, guide wavelength, phase CO5 7 Marks velocity of TE mode in a rectangular waveguide and prove that  $V_pV_g=V_c^2$ .
  - b) A rectangular wave guide has dimensions 2.5cm x 5cm. Determine the CO2 7 Marks guide wave length, phase constant ( $\beta$ ) and phase velocity (V<sub>P</sub>) at a wavelength of 4.5 cms for the dominant mode.

### 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 CO3 7 Marks Antenna.
  - b) An array contains 10 isotropic radiators with an inter element spacing of CO5 7 Marks  $0.5\lambda$ . 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.

#### Max. Marks: 70

# 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 $10^{\circ}$ , circumference C equal to $\lambda$ .                | 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 $30^{\circ}$ and $60^{\circ}$ 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 |

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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.                                                                                                                                                                                      | CO4 | 7 Marks |
|    |     | i) $y(n) = x(n+7);$ ii) $y(n) = x^{3}(n).$                                                                                                                                                                                                                                                                       |     |         |
|    |     | (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 $H_a(s) = s + 0.1/(s + 0.1)^2 + 9$ . 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 $\leq 2$ dB. Pass band edge frequency = 4KHz stop band attenuation $\geq 40$ 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<br>when impulse response is symmetry having N odd number of samples.                                                                                                                                                                      | CO3 | 7 Marks |
|    | 1 \ |                                                                                                                                                                                                                                                                                                                  | 000 | 7 ) ( 1 |

b) Design a Linear phase low pass FIR filter with a cutoff frequency of  $\pi/2$  CO3 7 Marks rad/sec frequency sampling technique. Take N=11.

# UNIT-V

| 9. | a) | Explain  | various | types | of | general | purpose | registers | in | TMS | 320C6X | CO1 | 7 Marks |
|----|----|----------|---------|-------|----|---------|---------|-----------|----|-----|--------|-----|---------|
|    |    | processo | or.     |       |    |         |         |           |    |     |        |     |         |

b) What is meant by bit reversal address mode? Write the applications for CO1 7 Marks which addressing are proffered.

## (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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## III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

### **IMAGE PROCESSING**

| [Electronics and Communication | Engineering] |
|--------------------------------|--------------|
|--------------------------------|--------------|

| Time | Max. Marks: 70                                                        |                                                                                                                                                                     |     |         |  |  |
|------|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------|--|--|
|      | Answer One Question from each Unit<br>All questions carry equal marks |                                                                                                                                                                     |     |         |  |  |
|      |                                                                       |                                                                                                                                                                     |     |         |  |  |
| 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:                                                                                                                              | CO1 | 9 Marks |  |  |
|      |                                                                       | i) Neighbours of a pixel.                                                                                                                                           |     |         |  |  |
|      |                                                                       | II) Adjacency.<br>iii) Distance measures                                                                                                                            |     |         |  |  |
|      | b)                                                                    | Explain the properties of slant transform                                                                                                                           | CO3 | 5 Marks |  |  |
|      | 0)                                                                    | UNIT-II                                                                                                                                                             | 000 |         |  |  |
| 3.   | a)                                                                    | For the given $4 \times 4$ image having grey scale between [0, 9], get the histogram equalized image and draw the histogram of image before and after equalization. | CO4 | 7 Marks |  |  |
|      |                                                                       | 2 3 3 2                                                                                                                                                             |     |         |  |  |
|      |                                                                       | 4 2 4 3                                                                                                                                                             |     |         |  |  |
|      |                                                                       | 2 2 3 5                                                                                                                                                             |     |         |  |  |
|      |                                                                       | 2 4 2 4                                                                                                                                                             |     |         |  |  |
|      | 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.<br>(OR)                                                                                         | CO5 | 8 Marks |  |  |
| 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.<br>(OR)                                                                                                              | CO4 | 8 Marks |  |  |
| 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.  | <ul> <li>a) Explain the detection of point, line and edge detection techniques.</li> <li>b) Explain how the PCP color model converted into HSI color space.</li> </ul> |                                                                                                   |            | 7 Marks<br>7 Marks |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|------------|--------------------|
|     | 0)                                                                                                                                                                     | 000                                                                                               | / WILLING  |                    |
| 10. | a)<br>b)                                                                                                                                                               | Explain adaptive thresholding.<br>Explain how gray level converted to color in pseudo color image | CO5<br>CO6 | 7 Marks<br>7 Marks |
|     |                                                                                                                                                                        | processing.                                                                                       |            |                    |

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### 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            |
| 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. <b>(OR)</b>                                                                                         | CO1        | 7 Marks            |
| 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            |
| 7   | a)         | Design a Matched Filter receiver for optimum echo detection in the                                                                                                      | CO3        | 7 Marks            |
| /.  | u)         | presence of noise.                                                                                                                                                      | 005        | / IVIUIND          |
|     | b)         | Compare branch type and balance type of duplexer.<br>(OR)                                                                                                               | CO2        | 7 Marks            |
| 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            |
| 0   | <b>a</b> ) | Explain in detail about LOPAN navigation system                                                                                                                         | CO1        | 7 Marka            |
| Э.  | a)<br>b)   | Analyze and contrast between LORAN and DECCA navigation systems.                                                                                                        | CO1<br>CO2 | 7 Marks<br>7 Marks |
| 10. | a)         | Explain the salient features of VHF Omni Directional Range (VOR)                                                                                                        | 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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#### **III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021**

#### **TELECOMMUNICATION SWITCHING SYSTEMS**

[Electronics and Communication Engineering]

Time: 3 hours **Answer One Question from each Unit** All questions carry equal marks UNIT-I Classify switching systems. With simple circuit, explain the working of CO1 1. 7 Marks a) telephone network. Why is it necessary to keep the magnetic diaphragm in an earphone b) CO3 7 Marks displaced from its unstressed position? How is this achieved? (**OR**) Explain 3 x 3 and 6 x 6 crossbar switching with neat sketches. 2. CO1 7 Marks a) b) What happens if the ratio  $\phi/\phi 0$  is not very small in case of an earphone? CO3 7 Marks UNIT-II ) Infer the objectives of numbering plan. How are they classified? 3. CO6 7 Marks a) Paraphrase the objectives of numbering plan with the help of example. CO1 7 Marks b) (**OR**) 4. Conclude the functions performed by subscriber line interface. Explain. CO1 7 Marks a) Analyze the objectives of charging plan. How are they classified? CO6 7 Marks b) (UNIT-III) 5. Originate channel associated and channel non associated mode of CO4 7 Marks a) signalling techniques. A group of 20 servers carry a traffic control of 10 erlangs. If the average CO3 7 Marks b) 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. (OR)What is grade of service? Obtain grade of service for three stage and four CO4 6. a) 7 Marks stage networks. On an average, one call arrives every 5 sec. During a period of CO3 b) 7 Marks 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? (UNIT-IV) What are the new services supported by ISDN? Explain any four of them CO5 7. 7 Marks a) in detail. Compare NISDN and BISDN. CO<sub>2</sub> 7 Marks b) (**OR**) 8. Summarize the motivation of ISDN. Explain its services, network and 7 Marks CO5 a) protocol architecture used for different applications. How functional modules are interconnected in BISDN and explain. b) CO<sub>2</sub> 7 Marks UNIT-V 9. What is CM and CMTS? Explain. CO1 7 Marks a) Compare ADSL, VDSL, HDSL and SDSL technologies. b) CO4 7 Marks (**OR**) 10. Write short notes on: CO1 7 Marks a) i) CM and CMTS. ii) DOCSIS. Explain in detail about ADSL with suitable block diagram. b) CO4 7 Marks

Max. Marks: 70

# SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

### DIGITAL CMOS IC DESIGN

[Electronics and Communication Engineering]

Max. Marks: 70

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

### UNIT-I

| 1.  | a)<br>b) | Explain the basic operation of 2-phase dynamic circuit.<br>Determine how to optimize multiple source drain connections in CMOS | CO1<br>CO4 | 7 Marks<br>7 Marks |
|-----|----------|--------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|
|     |          | logic design.                                                                                                                  |            |                    |
| 2   | -)       | (OR)                                                                                                                           | CO1        | ( Maular           |
| 2.  | a)       | example.                                                                                                                       | COI        | 6 Marks            |
|     | b)       | Write short notes for the following.                                                                                           | CO4        | 8 Marks            |
|     |          | i) C <sup>2</sup> MOS. ii) CVSL.                                                                                               |            |                    |
|     |          |                                                                                                                                |            |                    |
| 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.<br>(OR)                                                                        | CO3        | 5 Marks            |
| 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                                                           | CO1        | 11 Marks           |
|     | 1-)      | with sense amplifier and data write circuitry.                                                                                 | 0.05       | 2 Martin           |
|     | D)       | (OR)                                                                                                                           | COS        | 3 Marks            |
| 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.<br>(OR)                                                                    | CO6        | 3 Marks            |
| 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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#### 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

- a) Conclude the advantages of modified Chemical Vapor Deposition over CO2 7 Marks Vapor Phase Deposition.
   b) Design a silica optical fiber with a core diameter large enough to be CO3 7 Marks
  - b) Design a silica optical fiber with a core diameter large enough to be CO3 7 Marks 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.

#### (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 CO3 7 Marks considering number of modes and material composition of core suited for practical applications.

### UNIT-II)

3. a) Discuss about nonlinear scattering losses in optical fiber.
b) A long single-mode optical fiber has an attenuation of 0.5dBkm<sup>-1</sup> 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.
CO1 7 Marks 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 CO4 7 Marks
  - b) Infer the contribution of various absorption mechanisms for losses in CO4 7 Marks optical fibers.

### (UNIT-III)

- Conclude the effect of temperature on Avalanche Gain of a photo 5. CO6 7 Marks a) detector. b) Differentiate simulated and spontaneous Emissions. CO<sub>2</sub> 7 Marks (**OR**) Suggest improvements in Structures of InGaAs APDs to improve its 6. CO6 7 Marks a) performance. Contrast PIN Diode and Avalanche Photo Diode. CO2 7 Marks b) UNIT-IV) 7. A graded index fiber has a parabolic refractive index profile ( $\alpha = 2$ ) and a CO3 7 Marks 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. The end faces of two optical fibres with core refractive indices of 1.5 are CO4 b) 7 Marks
  - 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.
    - (OR)

- 8. a) Develop an expression to relate the power launched into a fiber and its CO3 7 Marks brightness. Justify the effect of equilibrium numerical aperture in a long fiber length.
  - b) A silica multimode step index fiber has a core refractive index of 1.46. CO4 7 Marks 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.

## 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 CO5 7 Marks receiver.

#### (**OR**)

10. a)List and summarize various multi-channel transmission techniques.CO17 Marksb)Develop a model setup for an ARQ Error Control Scheme.CO57 Marks

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### SREE VIDYANIKETHAN ENGINEERING COLLEGE

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#### III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

### SOFTWARE TESTING

[Computer Science and Engineering]

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:                                                                             | CO2 | 8 Marks |
|     |    | 1) Data Flow testing. 11) Mutation testing.                                                       |     |         |
|     |    | (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 |

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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

### SOFT COMPUTING

[Computer Science and Engineering]

Max. Marks: 70

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

# UNIT-I

| 1.  | a)<br>b) | Compare and contrast neuro genetic and fuzzy genetic hybrid systems.<br>Discuss in detail application scope of neural networks. | CO1<br>CO4 | 7 Marks<br>7 Marks |
|-----|----------|---------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|
|     |          | (OR)                                                                                                                            |            |                    |
| 2.  | a)<br>b) | What is Hebb net? Design a Hebb network to realize logical OR function.<br>Write a short note on evolution of neural networks.  | CO3<br>CO2 | 7 Marks<br>7 Marks |
|     |          |                                                                                                                                 |            |                    |
| 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?                                                                                     | CO5        | 7 Marks            |
|     | )        | $A = \{ 0.1 / 2 + 0.6 / 3 + 0.4 / 4 + 0.3 / 5 + 0.8 / 6 \}$                                                                     | 000        | ,                  |
|     |          | $B = \{ 0.5/2 + 0.8/3 + 0.4/4 + 0.6/5 + 0.4/6 \}$                                                                               |            |                    |
|     |          | Calculate $A \cap B$ , $B \cap A$ using fuzzy operation.                                                                        |            |                    |
|     | 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            |
|     |          |                                                                                                                                 |            |                    |
| 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            |
|     |          | \$P \$P \$P                                                                                                                     |            |                    |

### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

### III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

#### WIRELESS NETWORKS

### [Computer Science and Engineering]

Max. Marks: 70

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

# UNIT-I

| 1.  | a)<br>b) | Explain Non- Persistent, I-Persistent and P- Persistent CSMA protocols.<br>Explain the principle, frame structures and working of TDMA system. | CO2<br>CO1 | 8 Marks<br>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? (OR)                                                                       | CO3        | 6 Marks            |
| 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            |
| 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. (OR)                                                                                                      | CO5        | 4 Marks            |
| 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)                                                                                                                                           | 96.5       |                    |
| 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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#### 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. Why is it useful for a programmer to have some background in language 7 Marks a) CO1 design, even though he or she may never actually design a programming language? Explain the areas of computer applications and their associated languages. CO1 7 Marks b) (**OR**) 2. a) How pointers are implemented in Pascal? CO<sub>2</sub> 7 Marks b) List and explain briefly about user defined data types with examples. CO1 7 Marks UNIT-II ) 3. Explain about the switch statement in Algol with an example. CO4 7 Marks a) What is lazy evaluation? Explain the reasons why lazy evaluation may be b) CO4 7 Marks desirable. (**OR**) Describe the different categories of control flow mechanisms. 4. a) CO3 7 Marks Explain about control flow in Recursion. CO3 7 Marks b) (UNIT-III) 5. a) Explain about the models of parameter passing. CO4 7 Marks Explain about the co-routines with an example. CO2 7 Marks b) (**OR**) 6. Discuss about design issues of data abstraction. CO3 7 Marks a) b) List and explain about different abstract data types. CO1 7 Marks UNIT-IV 7. a) Define Monitor. Explain its concept. CO2 7 Marks Explain about the concurrency in Ada 95. CO4 7 Marks b) (**OR**) Describe the java throwable class hierarchy and the types of exceptions. 8. CO2 7 Marks a) Can you claim multiple exceptions in a method declaration? Illustrate by means of an example. What is exception? How to handle the exceptions in C++ with an b) CO1 7 Marks example? UNIT-V Explain the applications of logic programming. 9. CO4 7 Marks a) Describe about the search strategies in prolog. CO4 7 Marks b) (**OR**) 10. Explain the characteristics of functional programming languages. CO<sub>4</sub> 7 Marks a) b) Explain about the LISP, ML. CO6 7 Marks (f) *[*@} *[*]

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#### 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:<br>i) COME ii) DECE iii) MOVEE                                                                                                                                                                                   | CO2 | 6 Marks |
|    |    |                                                                                                                                                                                                                                 |     |         |
| 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 CO1 7 Marks using suitable examples.
  - b) Write an ALP to perform division of two numbers in ARM mode and then CO6 7 Marks switch to thumb mode to perform subtraction.

### (OR)

- 10. a) Demonstrate the use of the following instructions using suitable example. CO1 7 Marks RSC, ADC, CMN, TST, BL.
  - b) Compare ARM mode and thumb p mode programming of ARM. CO6 7 Marks

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

# PROCESS CONTROL INSTRUMENTATION

[Electronics and Instrumentation Engineering]

Max. Marks: 70

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

|    | UNIT-I                                                                                                                                                      |                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| a) | Describe the mathematical model of liquid process.                                                                                                          | CO3                                                                                                                                                  | 7 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| b) | Explain the characteristics of electric system.                                                                                                             | CO1                                                                                                                                                  | 7 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|    | (OR)                                                                                                                                                        |                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 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                                                                                                                                                     |                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 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)                                                                                                                                                        |                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|    | Explain the working of pneumatic PI controller with a neat diagram.                                                                                         | CO3                                                                                                                                                  | 14 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|    | UNIT-III)                                                                                                                                                   |                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 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)                                                                                                                                                        |                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|    | Explain in detail how time integral criteria lead to unique solution.                                                                                       | CO2                                                                                                                                                  | 14 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|    | UNIT-IV                                                                                                                                                     |                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| a) | Explain in detail about solenoid.                                                                                                                           | CO5                                                                                                                                                  | 7 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| b) | Explain in detail about Sliding-stem control valve.                                                                                                         | CO3                                                                                                                                                  | 7 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|    | (OR)                                                                                                                                                        |                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|    | Explain in detail about pneumatic and electronic valve positioner.                                                                                          | CO5                                                                                                                                                  | 14 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|    | UNIT-V                                                                                                                                                      |                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|    | 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)                                                                                                                                                        |                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|    | <ul> <li>a)</li> <li>b)</li> <li>a)</li> <li>b)</li> <li>a)</li> <li>b)</li> <li>a)</li> <li>b)</li> </ul>                                                  | <ul> <li>INIT-I</li> <li>a) Describe the mathematical model of liquid process.</li> <li>b) Explain the characteristics of electric system.</li></ul> | uNIT-1         a) Describe the mathematical model of liquid process.       CO3         b) Explain the characteristics of electric system.       CO1         (OR)       (OR)         a) What are process elements? Explain each one.       CO1         b) Determine the transfer function of a single tank liquid level system.       CO2         (UNIT-II)       CO3         a) What are the advantages of the displacement type pneumatic controllers?       CO3         b) Explain the working of electronic PID controller with a neat diagram.       CO3         (OR)       Explain the working of pneumatic PI controller with a neat diagram.       CO3         (OR)       Explain in detail about one-quarter decay ratio criteria.       CO4         b) Explain in detail about open-loop transient response method.       CO4         (OR)       Explain in detail about solenoid.       CO3         b) Explain in detail about solenoid.       CO5         b) Explain in detail about solenoid.       CO5         (OR)       CO3       (OR)         Explain in detail about solenoid.       CO5         b) Explain in detail about solenoid.       CO5         (OR)       Explain in detail about solenoid.       CO5         (OR)       Explain in detail about solenoid.       CO5         (OR) |

- 10.Compare cascade and signal loop control systems.CO414 Marks
  - \$} {} {}

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Time: 3 hours
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## III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

#### **OPTO-ELECTRONICS AND LASER INSTRUMENTATION** [Electronics and Instrumentation Engineering]

Time: 3 hours

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

## UNIT-I

| 1.  | a)<br>b) | Derive an expression for numerical aperture of a step Index fibre.<br>Describe what is meant by the fusion splicing of optical fibers. Discuss<br>the advantages and drawbacks of these joining techniques.                                                                         | CO1<br>CO1 | 7 Marks<br>7 Marks |
|-----|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|
| 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            |
| 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            |
| 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. (OR)                                                                                                                                                                                                         | CO5        | 7 Marks            |
| 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            |
| 9.  | a)       | Describe the construction and reconstruction of hologram.                                                                                                                                                                                                                           | CO1        | 7 Marks            |
|     | b)       | Explain about any three scientific applications of holography. <b>(OR)</b>                                                                                                                                                                                                          | CO1        | 7 Marks            |
| 10. |          | Define modulation and its types. Compare the types and explain about figure of merits.                                                                                                                                                                                              | CO1        | 14 Marks           |

SVEC-16

Max. Marks: 70

Time: 3 hours

## SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

#### III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

#### AIRCRAFT INSTRUMENTATION

[Electronics and Instrumentation Engineering]

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<br>help of a block schematic diagram the construction and operation of a<br>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 |

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## III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

#### **PROGRAMMABLE LOGIC CONTROLLERS**

[Electronics and Instrumentation Engineering]

| Time: 3 hours |    |                                                                                                |     | Marks: 70 |
|---------------|----|------------------------------------------------------------------------------------------------|-----|-----------|
|               |    | Answer One Question from each Unit                                                             |     |           |
|               |    | All questions carry equal marks                                                                |     |           |
|               |    |                                                                                                |     |           |
| 1.            |    | Explain the principle of operation of discrete ac input and output modules                     | CO1 | 14 Marks  |
|               |    | used in PLC with suitable diagrams.                                                            |     |           |
|               |    | (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.                                             | CO2 | 7 Marks   |
|               |    | 3 Input AND gate                                                                               |     |           |
|               |    | 2 Input NAND gate                                                                              |     |           |
|               |    | 3 Input NOR gate                                                                               |     |           |
|               |    | 2 Input NOR gate.                                                                              |     |           |
|               | 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                     | CO4 | 7 Marks   |
|               | ,  | 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.                          |     |           |
|               |    | (OR)                                                                                           |     |           |
| 10.           | a) | Describe PID tuning functions and methods.                                                     | CO4 | 7 Marks   |
|               | b) | Explain about PLC auxiliary commands and functions.                                            | CO5 | 7 Marks   |

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#### III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

#### **CLOUD COMPUTING**

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

Time: 3 hours

b)

#### 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 CO1 7 Marks Data center.
  - b) Describe the types of virtualization in cloud computing with suitable CO1 7 Marks examples.

#### (OR)

2. Compare the services and applications of Hyper-V and VMware CO2 14 Marks virtualization technologies.

## 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 CO1 7 Marks resources in public clouds.

#### (OR)

4. State and explain various cloud deployment models with suitable CO1 14 Marks examples.

#### (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, CO4 14 Marks elastic disk provisioning architecture and redundant storage architectures with neat sketch.

#### (UNIT-IV)

7. a) Explain various applications of cloud security.
b) Explain cloud scale for disaster recovery in cloud.
(OR)
8. Analyze various disasters that can occur in cloud. Evaluate the CO2 14 Marks appropriate recovery measures.

#### 9. a) Compare and contrast IaaS, PaaS and SaaS with suitable examples each. CO2 7 Marks

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 CO4 14 Marks Machine Instance on EC2 cloud

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Max. Marks: 70

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## III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

**AD-HOC AND WIRELESS SENSOR NETWORKS** 

#### [Information Technology]

Max. Marks: 70

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

## UNIT-I

| 1.  | a)<br>b)      | Explain the applications of Ad-hoc wireless networks.                                                                                                   | CO1  | 5 Marks<br>9 Marks         |
|-----|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|------|----------------------------|
|     | 0)            | and performance of an Ad-hoc wireless system.<br>i) Medium access scheme. ii) Routing. iii) Multicasting.                                               | 02   | 9 Walks                    |
| 2   | `             | (OR)                                                                                                                                                    | 001  |                            |
| 2.  | a)            | explain the following contention based MAC protocols of Ad-hoc networks.                                                                                | COI  | 9 Marks                    |
|     | 1 \           | 1) MACA. 11) MACAW.                                                                                                                                     | 001  | 5 3 6 1                    |
|     | b)            | Draw and explain the frame structure in D-PRMA protocol.                                                                                                | COI  | 5 Marks                    |
| 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)            | 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. (OR)                                                                                     | CO2  | 7 Marks                    |
| 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 OOS system                                                                                           | CO4  | 9 Marks                    |
|     | )             | i) Hard state versus soft state resources reservation.                                                                                                  |      | <i>y</i> 1,1 <b>0</b> ,110 |
|     |               | ii) Stateful versus Stateless approach.                                                                                                                 |      |                            |
|     |               | iii) Hard OOS versus soft OOS.                                                                                                                          |      |                            |
|     | b)            | Describe the layer wise classification of OOS solutions.                                                                                                | CO4  | 5 Marks                    |
|     | ,             | (OR)                                                                                                                                                    |      |                            |
| 8.  |               | Explain in detail about transmission power management schemes.                                                                                          | CO3  | 14 Marks                   |
| 0   | a)            | Describe the power efficient gathering for sensor information systems                                                                                   | CO3  | 7 Marks                    |
| ).  | $\frac{a}{b}$ | Compare wireless sensor networks with Ad-hoc wireless networks                                                                                          | COJ  | 7 Marks                    |
|     | 0)            | (OR)                                                                                                                                                    | 0.01 | / 10101115                 |
| 10. |               | List and explain various MAC protocols of wireless sensor networks.<br>$\bigotimes \bigotimes \bigotimes$                                               | CO2  | 14 Marks                   |

Time: 3 hours

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## 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

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

Max. Marks: 70

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| 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 |
| 2.  | a) | What is a data warehouse? Distinguish between operational database                             | CO1 | 7 Marks |
|     | b) | What are OLAP operations in the multidimensional data model? Explain.                          | CO3 | 7 Marks |
| 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 |
| 4   | a) | Briefly describe various forms of data preprocessing                                           | CO3 | 7 Marks |
|     | b) | Describe in detail datamining functionalities and the different kinds of natterns can be mined | CO5 | 7 Marks |
|     |    | UNIT-III                                                                                       |     |         |
| 5   | a) | Discuss the F-P growth algorithm with an example                                               | CO4 | 7 Marks |
| 0.  | 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. <b>(OR)</b>               | CO1 | 7 Marks |
| 8.  | a) | Write the DBSCAN algorithm and explain.                                                        | CO5 | 7 Marks |
|     | b) | What is partitioning method? Describe k-means clustering algorithm.                            | CO1 | 7 Marks |
| 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 |
| 10. | a) | How web usage mining different from web structure mining and web                               | CO2 | 7 Marks |
|     | b) | Discuss about spatial mining and its applications.                                             | CO1 | 7 Marks |
|     |    |                                                                                                |     |         |

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Time: 3 hours

## SREE VIDYANIKETHAN ENGINEERING COLLEGE

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## III B.Tech II Semester (SVEC-16) Supplementary Examinations March - 2021

#### **NETWORK SECURITY**

[Computer Science and Systems Engineering]

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. <b>(OR)</b>                            | CO6 | 9 Marks  |
| 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  |
|     |    |                                                                                                          |     |          |
| 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  |
|     |    | \$P & \$P                                                                                                |     |          |

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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                                                  |                |                    |
|               |          |                                                                                  |                |                    |
| 1             | 2)       | Evenlain the makile wash ansare as briefly                                       | CO1            | 7 Maulua           |
| 1.            | a)<br>b) | Explain the mobile web presence briefly.                                         | CO1            | / Marks<br>7 Marks |
|               | 0)       | (OR)                                                                             | COI            | / WIAIKS           |
| 2             | a)       | Explain the behavior of mobile user web browsing                                 | CO1            | 7 Marks            |
|               | b)       | What is Android and explain its features.                                        | COI            | 7 Marks            |
|               |          |                                                                                  |                |                    |
| 3             | a)       | Sketch the life cycle of an Activity and discuss its events                      | CO1            | 7 Marks            |
| 5.            | a)<br>h) | Develop an android program to illustrate the usage of all events of an           | CO1            | 7 Marks            |
|               | 0)       | activity.                                                                        | 005            |                    |
|               |          | (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       | CO4            | 7 Marks            |
|               |          | View.                                                                            |                |                    |
|               | b)       | List and explain the different views for displaying images.                      | CO1            | 7 Marks            |
| (             | - )      | (OR)                                                                             | $CO_{2}$       | 0 Maular           |
| 0.            | a)       | Develop an Android program to perform image transition using image               | 003            | 9 Marks            |
|               | h)       | Distinguish different ways to save and load of User Preferences                  | $CO^2$         | 5 Marks            |
|               | 0)       |                                                                                  | 002            | JIVIUIKS           |
|               |          | 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            |
| 8             | a)       | (UK)<br>Discuss the procedure to prevent the standard messaging application from | CO1            | 7 Marks            |
| 0.            | a)       | receiving a SMS message                                                          | COI            | / WIAIKS           |
|               | b)       | Create an Android application to send an e-mail.                                 | CO6            | 7 Marks            |
|               | ,        |                                                                                  |                |                    |
| 0             | 0)       | Discuss the tools required to develop the applications for an iOS                | CO5            | 7 Morka            |
| 9.            | a)<br>b) | Define Service and discuss the functionality a Service with a suitable           | C03            | 7 Marks            |
|               | 0)       | example.                                                                         | 001            |                    |
|               |          | (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             | CO3            | 7 Marks            |
|               |          | counter using Runnable, Thread and AsyncTask.                                    |                |                    |

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

#### **MOBILE COMPUTING**

[Computer Science and Engineering]

| Time | Time: 3 hours |                                                                                                                                                                                                                 |     |          |
|------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----------|
|      |               | <b>Answer One Question from each Unit</b>                                                                                                                                                                       |     |          |
|      |               | 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.<br>(OR)                                                                                                                                         | CO1 | 7 Marks  |
| 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  |
| 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. (OR) | CO2 | 7 Marks  |
| 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  |
| 7.   | a)            | Compare database hoarding and data caching. Describe Database hoarding                                                                                                                                          | CO2 | 7 Marks  |
|      | b)            | Justify how web cache is maintained in mobile Environment.                                                                                                                                                      | CO2 | 7 Marks  |
| 8.   |               | Summarize on following Indexing techniques:<br>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 |
|      |               |                                                                                                                                                                                                                 |     |          |
|      |               |                                                                                                                                                                                                                 |     |          |
|      |               | (OP)                                                                                                                                                                                                            |     |          |
| 10.  |               | Sketch the WAP architecture. Explain its layers and components briefly.                                                                                                                                         | CO1 | 14 Marks |

SVEC-16

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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

7

Max. Marks: 70 **Answer One Ouestion from each Unit** All questions carry equal marks UNIT-I 1. Sketch the model for network security and discuss each of its CO1 7 Marks a) components. List and briefly define categories of passive and active security attacks. CO1 7 Marks b) (**OR**) Decipher the message YITJP GWJOW FAQTQ XCSMA ETSQU 2. a) CO3 8 Marks SQAPU SQGKC PQTYJ using the Hill cipher with the inverse key 5 1 Show your calculations and result. 2 7 b) Distinguish between monoalphabetic cipher and polyalphabetic cipher. CO2 6 Marks UNIT-II Discuss about strengths of DES. 3. a) CO<sub>2</sub> 5 Marks b) Illustrate Diffie Hellman key Exchange in detail with an example. CO3 9 Marks (OR)Describe the key management of public key encryption in detail. CO3 7 Marks a) b) Explain RSA Algorithm with the following: CO4 7 Marks P=11, q=5, e=3 and PT=9. (UNIT-III) What is message authentication? List out various attacks that are to be CO3 a) identified while communication across a network. What are possible solutions to those attacks? Discuss about Message Authentication methods. CO3 b) (OR)Describe how SHA-512 is used to generate Message Digest and how it is CO4 a) different from SHA-1? b) Elaborate on Digital Signature standard and the approach used in it to CO<sub>4</sub> provide security. UNIT-IV Describe the architecture of IPSec COG 7 Marles Explain about counter measures to be considered for DDoS attacks. CO4. 6 Marks b) CO6 (**OR**) 10 Write a short note on: CO5 7 Marks a)

i) Viruses. ii) Firewalls. Discuss about spear phishing and phishing countermeasures. 7 Marks b) CO5

- 4.
- 5. 8 Marks
  - 6 Marks
- 6. 8 Marks 6 Marks

| 1. | a) | Describe the architecture of IPSec.                                              | CO0 | / WIAIKS |
|----|----|----------------------------------------------------------------------------------|-----|----------|
|    | 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  |

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#### **IV B.Tech I Semester (SVEC10) Supplementary Examinations February – 2021**

#### FINITE ELEMENT METHODS [Mechanical Engineering]

Time: 3 hours

#### 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  $\sigma_x$ =1000MPa,  $\sigma_y$ =-150MPa, E=200GPa, G=100GPa and v = 0.3. Deter the value of the stress  $\epsilon_x, \epsilon_y$  and  $\sigma_{xy}$ .
- 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 x 10<sup>-4</sup> m<sup>4</sup>. 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,  $E = 70 \times 10^3 MPa$ ,  $\mu = 0.3$



Fig. 1

- 5. Derive the element stiffness matrix for a quadrilateral element.
- 6. Heat is generated in a large plate with  $k = 0.7 \text{ w/m}^{\circ}\text{c}$  at the rate of 3000 w/m<sup>3</sup>, 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<sup>2</sup> °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,  $\rho = 7840$ kg/m<sup>3</sup>, I = 2000mm<sup>4</sup>, A = 240mm<sup>2</sup>.



Max. Marks: 70

|              | <b>SREE VIDYANIKETHAN ENGINEERING COLLEGE</b><br>(An Autonomous Institution, Affiliated to JNTUA, Anantapur)<br>IV B.Tech I Semester (SVEC-14) Supplementary Examinations August – 2021 |                                                                                                                                                                                  |                    |  |  |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--|--|
| Time         | • 3 ho                                                                                                                                                                                  | [ Electrical and Electronics Engineering ]                                                                                                                                       | av Marks: 70       |  |  |
| Time: 3 hour |                                                                                                                                                                                         | Answer One Question from each Unit<br>All questions carry equal marks                                                                                                            | ax, warks, 70      |  |  |
|              |                                                                                                                                                                                         |                                                                                                                                                                                  |                    |  |  |
| 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 $x(n) = \cos(n\pi/3)u(n)$ .<br>(OR)                                                                                                                | 7 Marks            |  |  |
| 2            | a)                                                                                                                                                                                      | Explain the significance of frequency domain representation of discrete time signals and system.                                                                                 | e 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 $y(-1)=0$ .                                               | e 7 Marks          |  |  |
| 3            | a)                                                                                                                                                                                      | Contrast the transforms DTFT, DFS and DFT.                                                                                                                                       | 7 Marks            |  |  |
|              | b)                                                                                                                                                                                      | Develop the inverse FFT algorithm with neat sketch for N=8.<br>(OR)                                                                                                              | 7 Marks            |  |  |
| 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            |  |  |
| 5            | a)                                                                                                                                                                                      | Derive the relation between analog and digital frequency in bilinear transformation.                                                                                             | r 7 Marks          |  |  |
|              | b)                                                                                                                                                                                      | Compare Bi-linear and Impulse Invariant Transformations.<br>(OR)                                                                                                                 | 7 Marks            |  |  |
| 6            | a)                                                                                                                                                                                      | For the given specifications $\alpha_p = 3 \text{ dB}$ ; $\alpha_s = 15 \text{ dB} \Omega_p = 1000 \text{ Rad/sec}$ . Design a high pass filter using Butterworth approximation. | a 7 Marks          |  |  |
|              | b)                                                                                                                                                                                      | Derive the frequency mapping expression for bilinear transformation.                                                                                                             | 7 Marks            |  |  |
| 7            | a)                                                                                                                                                                                      | Design a linear phase FIR low pass filter using rectangular window with a cu off frequency $\omega_{n=0} 2\pi rad/sample by taking 7samples of window sequence$                  | t 7 Marks          |  |  |
|              | b)                                                                                                                                                                                      | What is the drawback in FIR filter design using windows and frequency sampling method? How is it overcome?                                                                       | y 7 Marks          |  |  |
| 8            | a)                                                                                                                                                                                      | Explain the design of linear phase FIR filter by the Frequency sampling                                                                                                          | g 5 Marks          |  |  |
|              | b)                                                                                                                                                                                      | Obtain the Cascade and parallel form of realizations for the following transfer<br>$1(1+1)^2$                                                                                    | r 9 Marks          |  |  |
|              |                                                                                                                                                                                         | function $H(z) = \frac{16(1+z)z^2}{(4z^2 - 27z + 1)(4z + 3)}$ .                                                                                                                  |                    |  |  |
|              |                                                                                                                                                                                         | 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. (OR)                                                                                                                              | 7 Marks            |  |  |
| 10           | a)<br>b)                                                                                                                                                                                | Discuss about multiple access memory and multiported memory.<br>Explain the features of 'C6X processes.                                                                          | 7 Marks<br>7 Marks |  |  |

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**CODE No.:14BT60431** 

Time: 3 hours

SREE VIDYANIKETHAN ENGINEERING COLLEGE

Roll No.

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations August - 2021

#### **PRINCIPLES OF COMMUNICATION**

[Electrical and Electronics Engineering]

Max. Marks: 70

SVEC-14

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       |
|   |    | $G_{\tau}(t)=1$ $ t  < \tau/2$                                                 |               |
|   |    | $0  t  > \tau/2$                                                               |               |
|   |    | (OR)                                                                           |               |
| 2 | a) | Explain in detail about each block of basic electrical communication system    | 8 Marks       |
|   |    | with neat block diagram.                                                       |               |
|   | 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         | 8 Marks       |
|   |    | arbitrary baseband signal m(t).                                                |               |
|   | 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        | 4 Marks       |
|   |    | and 10.125K w when the carrier is sinusoidally modulated. Find the modulation  |               |
|   |    |                                                                                |               |
| _ | ,  |                                                                                | 0.14          |
| 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   | 6 Marks       |
|   |    | of these two affects more than one channel and mention the reasons?            |               |
| 6 | a) | (UK)<br>Evaluin natural compliant and flat ton compliant and compare these two | 9 Marka       |
| 0 | a) | Two signals are hand limited to 2 and 5 kHz and are to be time division        | 6 Marks       |
|   | 0) | multiplexed Find the maximum possible interval between two successive          | 0 WIAIKS      |
|   |    | samples                                                                        |               |
|   |    | 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       |
|   | 0) | (OR)                                                                           | 0 10 10 10 10 |
| 8 | a) | Determine the bandwidth required for M-ary FSK. Draw the geometrical           | 9 Marks       |
|   | /  | representation of M-ary FSK signal.                                            |               |
|   | 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, 8 Marks 0.21, 0.05, 0.03, 0.01. Find the coding efficiency using Shanon-Fano algorithm.
  - 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 | on Codes with examples.  | 8 Marks |
|    |    | ~                                   | ~ ~                      |         |

SVEC-14

Time: 3 hours

Roll No.

| SREE VIDYANIKETHAN | <b>ENGINEERING</b> | COLLEGE |
|--------------------|--------------------|---------|
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(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 ]

| Max. | Marks: | 70 |
|------|--------|----|
|------|--------|----|

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

## UNIT-I

| 1  | a)<br>b) | Draw and explain the components of Data Warehouse Architecture.<br>Differentiate OLAP Vs OLTP systems. | 8 Marks<br>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. <b>(OR)</b>                             | 7 Marks            |
| 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            |
|    |          | \$\$ \$\$ \$                                                                                           |                    |

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations August - 2021

#### **STEEL STRUCTURES**

[ Civil Engineering ]

Max. Marks: 70

SVEC-14

Time: 3 hours

Answer One Question from each Unit All questions carry equal marks

## UNIT-I )

1 Mention the standard specifications and codes of steel structures. Mention 14 Marks mechanical properties of steel.

(OR)

2 Define rolled steel sections and mention the types of rolled steel sections with a 14 Marks neat sketch representing the shapes and dimensions.

## UNIT-II)

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.

#### (OR)

4 Design a fillet weld to join a tension member consisting of 2 ISA 14 Marks 100mm x 75mm x 8mm to a 12mm thick gusset plate. The factored tensile load is 410 KN.

### (UNIT-III)

5 Design a single angle to carry a tension of 150kN. The end connection is to be 14 Marks 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.

#### (**OR**)

6 Design a single angle discontinuous strut to carry a factored axial compressive 14 Marks 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.

## 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 14 Marks compressive load of 2000 kN. Provide two channels back to back connected with battens by site welded connections. Use steel of grade Fe 410.

## UNIT-V

9 A column of ISMB 400 is subjected to an axial force of 750kN. Use appropriate 14 Marks techniques to analyse and design suitable base plate. Assume necessary data required.

## (OR)

10 A built up column consists ISHB 400@ 77.40 kg/m with one 14 Marks 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<sup>2</sup>.

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Time: 3 hours

2

a)

#### **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 ]

Max. Marks: 70

SVEC-14

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

## UNIT-I

- a) A vehicle of weight 2.0 tonneshidsthreough a distance equal to 40 m before 7 Marks 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.
  - b) Discuss about accident studies and records. Analyse accident rate with respect 7 Marks to time

#### (OR)

7 Marks

b) Analyse graphically and through formulae, the relationship between Speed, 7 Marks Travel time, Volume, Density and Capacity.

## UNIT-II

- 3 a) Indicate the how the traffic volume data are presented and results used in traffic 7 Marks volume studies?
  - b) A vehicle skids through a distance equal to 40 m before colliding with another 7 Marks 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.

#### (OR)

- 4 a) Explain traffic capacity, basic capacity, possible capacity, practical capacity 7 Marks and PCU.
  - b) Calculate the basic capacity of traffic lane at a speed of 50 kmph. Assume that 7 Marks all the vehicles are of average length 5 m.

## 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 14 Marks 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.

## UNIT-IV

- 7 The spot speeds at a particular location are normally distributed with a mean of 14 Marks 51.7 KPH and a standard deviation of 8.3 KPH. What is the probability that
  - i) The sppeds exceed 65 KPH.

Explain Road user and Vehicle characteristics.

- ii) And the speeds lie between 40 KPH and 70 KPH.
- iii) What is the 85<sup>th</sup> 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?

# UNIT-V

| 9  | a) | Explain briefly the methodology of Road safety Audit.                             | 7 Marks |
|----|----|-----------------------------------------------------------------------------------|---------|
|    | b) | Write a short note on the following.                                              | 7 Marks |
|    |    | i) Transport system magement.                                                     |         |
|    |    | ii) Travel demand Management.                                                     |         |
|    |    | (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 |
|    |    | A   A                                                                             |         |
|    |    |                                                                                   |         |

SVEC-14

**CODE No.:14BT70202** 

Roll No.

### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

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

#### POWER SYSTEM OPERATION AND CONTROL

[ Electrical and Electronics Engineering ]

Time: 3 hours

Max. Marks: 70

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

## UNIT-I

- 1 a) Derive the condition for economical load dispatch among various generating 7 Marks plants. Also explain with flow chart for the solution of economical load dispatch problem by  $\lambda$ -iteration method
  - b) Determine the operating schedule of 2-generator case of 100MW each whose 7 Marks incremental characteristics are given by

$$\frac{dF_1}{dF_2} = 2 + 0.012P_1 \qquad \frac{dF_2}{dP_2} = 1.5 + 0.015P_2$$

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.
  - b) Three plants of total capacity 500Mw are scheduled for operation to supply a 7 total system load Of 310Mw. Evaluate the optimum load scheduling .If the plants have the following incremental cost characteristics and the limitations

$$\frac{dc_1}{dp_{g_1}} = 0.12P_{G1} + 30Rs / MWh$$
$$\frac{dc_2}{dp_{g2}} = 0.2P_{G2} + 40.0Rs / MWh$$
$$\frac{dc_3}{dp_{g3}} = 0.15P_{G3} + 10Rs / MWh$$
$$30 \le P_{G1} \le 150 \qquad 20 \le P_{G2} \le 100 \qquad 50 \le P_{G3} \le 250.$$
$$\textbf{UNIT-II}$$

3 Obtain the Optimal Operation of a fundamental hydro thermal system with 14 Marks necessary equations.

(OR)

- 4 a) Obtain the short-term scheduling of hydrothermal power system using penalty 7 Marks factor.
  - b) Derive and explain about Hydro Power Equation. 7 Marks

5 Draw the flowchart and explain the unit commitment problem using priority 14 Marks list method.

#### (**OR**)

- 6 a) Explain the dynamic programming method used for unit commitment of 7 Marks power flow.
  - b) Explain the various constraints in unit commitment problem. 7 Marks

7 Marks

7 Marks

## UNIT-IV

- 7 a) Derive the Model of a Speed governing systems and represent it by a block 7 Marks diagram.
  - 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 7 Marks approximate linear model.
  - b) Derive the Model of a Generator Load model and represent it by a block 7 Marks diagram.

## UNIT-V

- 9 a) Explain about LFC of isolated power system; derive the steady state frequency 8 Marks error.
  - 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 7 Marks develop the appropriate block diagram representation of two area LFC and explain.
  - b) What are tie-line oscillations? What determines the frequency of these 7 Marks oscillations?

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Roll No.

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

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

POWER SYSTEM ANALYSIS [Electrical and Electronics Engineering]

Time: 3 hours

2

Max. Marks: 70

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

1 Develop all incidence matrices A, A<sup>^</sup>, B, B<sup>^</sup>, C and C<sup>^</sup> for the network shown 14 Marks in fig 1.consider bus 1 as reference.



## (OR)

a) Deduce the equation to form Y bus using singular transformation method.
b) State and explain primitive network.
6 Marks

## UNIT-II

3 Develop the design procedure of modification of existing Z<sub>Bus</sub> 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 7 Marks transformers.
  - b) Write down the expressions and explain the terms in Park's and Clarke's 7 Marks transformations.

## (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 4 Marks needed for load flow studies?

(OR)

6 Determine bus voltages at the end of  $2^{nd}$  iteration by Gauss-Seidal method. Take 14 Marks acceleration factor as 1.6.

| Table 1  |                      |  | Table 2  |                       |                          |          |         |
|----------|----------------------|--|----------|-----------------------|--------------------------|----------|---------|
| Bus Code | Admittances<br>(p.u) |  | Bus Code | P <sub>D</sub> in p.u | Q <sub>D</sub> in<br>p.u | V in p.u | Remarks |
| 1-2      | 2 <b>– j</b> 8       |  | 1        | -                     | -                        | 1.06∟0°  | Slack   |
| 1-3      | 1 – j4               |  | 2        | 0.5                   | 0.2                      | -        | PQ      |
| 2-3      | 0.6 – j2.6           |  | 3        | 0.4                   | 0.3                      | _        | PQ      |

UNIT-I

## (UNIT-IV)

- 7 a) Derive the necessary expressions for Jacobian matrix elements for N-R method in 10 Marks Polar form.
  - b) Compare the features of Gauss Seidel and Newton Raphson load flow 4 Marks methods.

#### (OR)

8 Explain with a flow chart the computational procedure for load flow solution 14 Marks using Newton Raphson method.

## UNIT-V

- 9 a) Write a note on methods of improving steady state and transient stabilities of a 7 Marks power system network.
  - b) Explain point by point method of solving Swing equation by deriving necessary 7 Marks equations.

#### (**OR**)

10 a) Define the following terms:

7 Marks

- i) Steady state stability. ii) Dynamic stability.
- iii) Transient stability. iv) Steady state stability limit.
- v) Synchronizing power co-efficient.
- b) List the assumptions made in stability solution. Also discuss the various methods 7 Marks of improving stability.

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Roll No.

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

IV B.Tech I Semester (SVEC14) Supplementary Examinations August - 2021

## FINITE ELEMENT METHODS

[ Mechanical Engineering ]

Max. Marks: 70

SVEC-14

Time: 3 hours

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<sub>1</sub>=70 GPa, E<sub>2</sub>=105 GPa, E<sub>3</sub>=200 GPa, A<sub>1</sub>=900 mm<sup>2</sup>, A<sub>2</sub>= 400 mm<sup>2</sup>



#### 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 14 Marks construct the shear force and bending moment diagrams for the beam. Take  $E = 20 \times 10^6 \text{ N/cm}^2$  and  $I = 2500 \text{ cm}^4$ .



4 Derive the element stiffness matrix and the nodal load matrices for a B-nodal 14 Marks triangular element.



5 Derive the element stiffness matrix and load vector and traction for a CST 14 Marks element.

#### (**OR**)

For a long cylinder of inside diameter 8cm and outside diameter 12cm snugly 14 Marks 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



Fig.3

## UNIT-IV

7 Consider a brick wall thickness 0.3m with the thermal conductivity of 14 Marks 0.7 W/mK. The inner surface is at 28°C and the outer surface is exposed to cold air with the heat transfer coefficient of 40 W/m<sup>2</sup> K at -15°C. Determine the steady state temperature distribution and also the heat flux through the wall. Use two elements and obtain the solution.

#### (OR)

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

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 14 Marks E=200GPa and density=7850 kg/m<sup>3</sup>.



Fig. 4.

 CODE No.:14BT71504 **SVEC-14** Roll No. SREE VIDYANIKETHAN ENGINEERING COLLEGE (An Autonomous Institution, Affiliated to JNTUA, Anantapur) IV B.Tech I Semester (SVEC14) Supplementary Examinations August – 2021 SIMULATION AND MODELING [ Computer Science and Engineering ] Time: 3 hours Max. Marks: 70 **Answer One Ouestion from each Unit** All questions carry equal marks UNIT-I 1 Briefly explain simulation of inventory system. 7 Marks a) Describe how arrays are used for List Processing. 7 Marks b) (**OR**) 2 Discuss in detail various features when selecting simulation software. 14 Marks UNIT-II) 3 Explain the following continuous distribution: 6 Marks a) i) Uniform distribution. ii) Exponential distribution. Explain the properties of a Poisson process. 8 Marks b) (**OR**) 4 a) Discuss about non stationary Poisson process. 7 Marks Describe empirical distributions. 7 Marks b) UNIT-III) List out the measures of performance of queuing systems. 5 14 Marks (**OR**) Describe the steady state behavior of finite population model. 6 7 Marks a) The malfunctions occur in a widget making machines follows Poisson 7 Marks b) 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? UNIT-IV What is a random number and what are its properties? 7 Marks 7 a) b) Describe the process to test the uniformity using Kolmogorov -Smirnov 7 Marks test. (**OR**) 8 Describe the method of generating random numbers using combined linear 7 Marks a) congruential method. Describe the method of generating random variates for the exponential b) 7 Marks distribution. UNIT-V List out the precautions to be taken while collecting the data. 9 7 Marks a) What are the parameter estimators for Poisson, Exponential and Normal **b**) 7 Marks **Distributions**? (**OR**) 10 Describe the general strategy to obtain Batch means for interval estimation 14 Marks in steady state simulation.

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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)<br>b) | Find out the Z-transform for the discrete time sequence $x(n) = kn$ , $n \ge 0$ .<br>Define causality and stability of an LTI system and state the conditions for stability. | 7 Marks<br>7 Marks |
|----|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| 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            |
| 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.<br>(OR)                                                                                                             | 7 Marks            |
| 6  | a)       | For the given specifications $\alpha_p = 3 dB$ ; $\alpha_s = 15 dB \Omega_p = 1000 Rad/sec$ . Design a high pass filter using Butterworth approximation                      | 7 Marks            |
|    | b)       | Derive the frequency mapping expression for bilinear transformation.                                                                                                         | 7 Marks            |
|    |          | UNIT-IV                                                                                                                                                                      |                    |
| 7  | a)       | 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. <b>(OR)</b>                                                                                  | 7 Marks            |
| 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 $0.4\pi$ to $0.6\pi$ 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. (OR)                                                                                                           | 7 Marks            |
| 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            |
|    |          | ନ୍ତି ନି                                                                                                                                                                      |                    |

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

#### **DATAWAREHOUSING AND DATA MINING**

[ Computer Science and Systems Engineering ]

| [Computer Science and Systems Engineering]                                |                |
|---------------------------------------------------------------------------|----------------|
| rs                                                                        | Max. Marks: 70 |
| Answer One Question from each Unit                                        |                |
| All questions carry equal marks                                           |                |
| UNIT-I                                                                    |                |
| Define data ware housing. Explain the characteristics of data ware house. | 7 Ma           |
| Briefly discuss the working principle of data mining.                     | 7 Ma           |
| (OR)                                                                      |                |

|   |    | (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 |

\$P \$P \$P

Marks

Marks

Time: 3 hours

a)

b)

1

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

## **POWER SEMICONDUCTOR DRIVES**

#### [Electrical and Electronics Engineering]

Time: 3 hours

**Answer One Ouestion 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 Explain rectifier control of **dc** series motor. a)
  - Speed of a dc series motor coupled to a fan load is controlled by variation of 7 Marks b) 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  $1.0\Omega$ . Calculate:

i) Motor armature voltage for the fan speed of 350 r.p.m.

ii) Motor speed for the armature voltage of 250 V.

#### (**OR**)

- Explain continuous and discontinuous operation of three phase semi controlled 4 a) 7 Marks converter connected to separately excited dc motor.
  - A 220V, 1200 r.p.m 15A separately excited motor has the armature resistance 7 Marks b) and Inductance of 1.8  $\Omega$  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)  $\alpha = 45^{\circ}$  and Torque = 40 N-m.
    - ii)  $\alpha = 45^{\circ}$  and Torque = 10 N-m.

## UNIT-III)

5 Explain closed loop control scheme for speed control of dc separately excited 14 Marks motor.

#### (**OR**)

- Explain the speed control of dc series motor fed from two quadrant choppers. 6 7 Marks a) Draw the motoring and regenerative braking characteristics.
  - A 220 V, 24 A, 1000 r.p.m dc separately excited motor has an armature 7 Marks b) resistance of  $2\Omega$ . 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.

## UNIT-IV

- Explain speed control of Induction motors using AC voltage controller. 7 6 Marks a) 8 Marks b)
  - Explain with circuit and waveforms for speed control of induction motor by Static rotor resistance.

Max. Marks: 70

7 Marks

(OR)

- 8 a) Why stator voltage control is suitable for speed control of induction motors in 7 Marks fan and pump drives.
  - b) With necessary block diagram, explain operation of variable frequency control 7 Marks of 3-phase Induction motor.

## 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 |

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(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 7 Marks plants. Also explain with flow chart for the solution of economical load dispatch problem by  $\lambda$ -iteration method
  - b) Determine the operating schedule of 2-generator case of 100MW each whose 7 Marks incremental characteristics are given by

$$\frac{dF_1}{dF_2} = 2 + 0.012P_1 \qquad \frac{dF_2}{dP_2} = 1.5 + 0.015P_2$$

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  $IC_1=20+0.3P_1$   $IC_2=30+0.4P_2$   $IC_3=30$ . 7 Marks

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 7 Marks considering losses).

## UNIT-II)

- 3 a) Derive the co-ordination equation for the optimal scheduling of hydrothermal 7 Marks interconnected power plants.
  - b) Explain different constraints to be considered for mathematical modeling of 7 Marks hydrothermal scheduling.

#### (OR)

- 4 a) Obtain the short-term scheduling of hydrothermal power system using penalty 7 Marks factor.
  - 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 7 Marks a power system.
  - b) What is the cost function for unit commitment? Explain its significance in unit 7 Marks commitment.

#### (OR)

6 What are the various methods of unit commitment? Explain each of them with 14 Marks relevant equations.

## UNIT-IV

- 7 a) Draw the block representation of a complete AC excitation system and explain 7 Marks its features.
  b) Explain the various performance requirements of avaitation system.
  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 14 Marks block representation and transfer function.

#### UNIT-V)

9 Define the terms: 5 Marks a) i) Control Area. ii) Coherent Group. iii) Area Control Error. Deduce with necessary equations, Dynamic response of LFC of an isolated 9 Marks b) power system with integral controller. (**OR**) Explain about LFC of isolated power system; derive the steady state frequency 10 a) 8 Marks error

| b) | Define the following terms: |                    |                    | 6 Marks |
|----|-----------------------------|--------------------|--------------------|---------|
|    | i) Tie Line                 | ii) Coherent group | iii) Control Area. |         |

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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

2 Marks

#### 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. 7 Marks Using the tie-set schedule obtain the loop equations and find the currents in all branches.



b) For the network of Fig.1, write a cut-set schedule, obtain modal equations and 7 Marks find branch currents.

#### (OR)

- 2 a) What is primitive network matrix and represent its forms? Prove 10 Marks  $Y_{bus} = A_t[y]A$  using singular transformation.
  - b) What is the difference between element-node incidence matrix and bus- 2 Marks incidence matrix?
  - c) What is primitive network matrix?

#### UNIT-II

3 a) Starting from Z<sub>bus</sub> for a partial network describe step - by - step how you 7 Marks willobtain the Z<sub>bus</sub> for a modified network when a new line is to be added to a bus in the existing network.
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 8 Marks impedance is added or removed.
  - b) Explain the purpose of Parks's transformation with neat diagram and relevant 6 Marks equations.

## UNIT-III)

- 5 a) What are the initial conditions assumed for the power flow studies by GS 7 Marks method? What is acceleration factor? What is its role in GS method for power flow studies?
  - b) Draw and explain the flow chart for Gauss Seidel load flow method. 7 Marks

| Ta       | ble 1                |          |                       | Table 2                  | 2        |         |  |
|----------|----------------------|----------|-----------------------|--------------------------|----------|---------|--|
| Bus Code | Admittances<br>(p.u) | Bus Code | P <sub>D</sub> in p.u | Q <sub>D</sub> in<br>p.u | V in p.u | Remarks |  |
| 1-2      | 2 <b>– j</b> 8       | 1        | _                     | -                        | 1.06∟0°  | Slack   |  |
| 1-3      | 1 – j4               | 2        | 0.5                   | 0.2                      | -        | PQ      |  |
| 2-3      | 0.6 – j2.6           | 3        | 0.4                   | 0.3                      | -        | PQ      |  |

6 Determine bus voltages at the end of  $2^{nd}$  iteration by Gauss-Seidal method. 14 Marks Take acceleration factor as 1.6.

## (UNIT-IV)

Develop static load flow equations in rectangular form. 7 Marks 7 a)

Compare different methods of load flow studies. b)

8

7 Marks

(**OR**)

- 7 Marks
- Explain fast decoupled load flow studies with relevant equations. a) Deduce the equations of elements of Jacobin matrix in rectangular 7 Marks b) coordinates.

## UNIT-V

- 9 Derive the expression for Swing equation of a SMIB system. What is the 7 Marks a) significance of swing curve?
  - With the help of Equal area criterion for one machine connected to Infinite 7 Marks b) bus, derive the expressions for critical clearing angle and critical clearing time

#### (**OR**)

- 10 a) With the help of relevant expressions, explain the procedure of solving 7 Marks transient stability problem by Step by Step method.
  - A 50HZ generator is delivering 50% of the power that is capable of delivering 7 Marks b) 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.

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

#### FINITE ELEMENT METHODS [Mechanical Engineering]

Time: 3 hours

6

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

Max. Marks: 70

## 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 14 Marks beam of 10kN. Calculate the deflection at the end of the beam using FEM, if E = 70Gpa, A=500mm<sup>2</sup> and I = 2500mm<sup>4</sup>.

## UNIT-III

| 5 | a)  | Derive the stiffness matrix of a constant strain triangle from fundamentals using | 8 Marks |
|---|-----|-----------------------------------------------------------------------------------|---------|
|   |     | Potential Energy approach.                                                        |         |
|   | 1 \ |                                                                                   |         |

b) Define plane stress and plane strain conditions with examples. 6 Marks

#### (OR)

- 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 7 Marks the sides of a linear Axisymmetric triangular element.

## UNIT-IV

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

#### (OR)

8 a) Discuss in detail about the concept of iso parametric element.
b) Differentiate sub parametric and super parametric elements.
7 Marks

## UNIT-V

- 9 a) Discuss about Lumped mass matrix and Consistent mass matrix.6 Marksb) Derive the elemental mass matrix for CST element.8 Marks(OR)
- 10 a) Derive the element mass matrix for 1-D bar element.
  b) Explain the features of Hamilton's interpolation function with an example.
  7 Marks
  7 Marks
  - \$} \$} \$} \$}
    - 1

(An Autonomous Institution, Affiliated to JNTUA, Anantapur) IV B.Tech I Semester (SVEC14) Supplementary Examinations February - 2021 **METROLOGY AND MEASUREMENTS** [Mechanical Engineering]

Time: 3 hours

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

## UNIT-I

Define "Interchangeability" and discuss its importance. 5 Marks 1 a) Describe in brief the construction and working of an optical comparator with a 9 Marks **b**) neat sketch. (**OR**) What is meant by the term "fit". Explain the various types of fits. 2 7 Marks a) b) State and explain Taylor's Principe of limit gauging. 7 Marks UNIT-II ) 3 Outline the importance of providing standards of length while measuring. 7 Marks a) What is sine bar? How is it used for angle measurements? 7 Marks b) (**OR**) 4 Explain the principle of working of a sine bar for angular measurement with the 9 Marks a) help of a diagram. List the advantages and limitations of sine bar. With the help of sketches, explain the working of an external micrometer. b) 5 Marks (UNIT-III) 5 Discuss the following terms in connection with surface finish measurement. 6 Marks a) i) Waviness. ii) Lay. iii) Sampling Length. iv) R<sub>z</sub> value. Explain the principle of Talysurf surface recorder with neat sketch. 8 Marks b) (**OR**) List out various BIS symbols for indication of surface finish. 6 a) 7 Marks What are the elements of screw thread? Also explain errors in screw threads. 7 Marks b) UNIT-IV) 7 Mention various types of electrical transducers and explain in detail the working 14 Marks of inductance type of transducers with its advantages and disadvantages. (**OR**) 8 List out different types of speed measuring devices and explain about 14 Marks Mechanical Tachometer and Electrical Tachometer. UNIT-V Explain the calibration procedure in temperature measurement. 9 7 Marks a) What is the principle of Radiation methods of measuring temperature? 7 Marks b)

#### (**OR**)

- 10 a) Explain the principle of dead weight gauge. 7 Marks Explain the principle of Prony brake Dynamometer. 7 Marks b)
  - (j) æ

Max. Marks: 70
#### 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 ]

Max. Marks: 70

Answer One Question from each Unit All questions carry equal marks

### UNIT-I

| a)<br>b) | Compare air refrigeration systems with vapor compression systems.<br>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°C and the air coming out of refrigerator is 0°C.                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |  |  |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
|          | (OR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |  |  |
| a)<br>b) | Sketch and explain the working of Boot strap cooling system used in Aircrafts.<br>Discuss the concepts of Heat engines, Refrigerators and Heat pumps.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 10 Marks<br>4 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |
|          | (UNIT-II)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |  |  |
| 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.<br>(OR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 6 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |  |  |
| 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |  |  |
| 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. <b>(OR)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 8 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |  |  |
| a)       | Explain the working principle of steam jet refrigeration system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 8 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |  |  |
| b)       | Explain the working principle of thermoelectric refrigerator.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |  |  |
|          | (UNIT-IV)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |  |  |
| a)       | Define the following.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 10 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |
| ,        | <ul> <li>i) Specific humidity. ii) Relative humidity. iii) Sensible heating.</li> <li>iv) Sensible cooling. v) Humidification and dehumidification.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |  |  |
| b)       | List the differences between summer and winter air conditioning systems.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 4 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |  |  |
| a)       | (UK)<br>Explain the following and represent it on psychometric chart                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 10 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |
| a)       | <ul> <li>i) Cooling and dehumidification.</li> <li>ii) Adiabatic saturation temperature</li> <li>iii) Bypass factor</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 10 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |
| b)       | Define psychometry and show all psychometric properties on psychometric chart.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |  |  |
| ``       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |  |  |
| a)       | Explain the factors on which comfort feeling of people in A/C depends.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 6 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |  |  |
| 0)       | Discuss Air to Air neat pump circuit and list its applications.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 8 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |  |  |
| 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.<br>$\circledast \ \circledast \ \circledast$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 6 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |  |  |
|          | <ul> <li>a)</li> <li>b)</li> </ul> | <ul> <li>a) Compare air refrigeration systems with vapor compression systems.</li> <li>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°C and the air coming out of refrigerator is 0°C. (OR)</li> <li>a) Sketch and explain the working of Boot strap cooling system used in Aircrafts.</li> <li>b) Discuss the concepts of Heat engines, Refrigerators and Heat pumps. UNIT-II</li> <li>a) Explain Vapor compression refrigeration system and sketch the processes on T-S and P-h property charts.</li> <li>b) What is ASHRAE coding of refrigerants? Give examples for each class. (OR)</li> <li>a) Discuss the effects of superheating and sub cooling on the performance of simple vapor compression refrigeration cycle.</li> <li>b) What are the types of refrigerants and discuss the need of new refrigerants. (OR)</li> <li>a) Explain the working principle of steam jet refrigeration system.</li> <li>b) Explain the working principle of steam jet refrigerator. (OR)</li> <li>a) Define the following. <ul> <li>i) Specific humidity.</li> <li>ii) Specific humidity.</li> <li>iii) Sensible heating.</li> <li>iv) Sensible cooling. v) Humidification and dehumidification.</li> <li>b) List the differences between summer and winter air conditioning systems. (OR)</li> </ul> </li> <li>a) Explain the following and represent it on psychometric chart. <ul> <li>i) Cooling and dehumidification.</li> <li>ii) Adiabatic saturation temperature.</li> <li>iv) Sensible cooling.</li> <li>i) Adiabatic saturation temperature.</li> <li>iv) Sensible cooling.</li> <li>i) Explain the factors on which comfort feeling of people in A/C depends.</li> <li>b) Discuss Air to Air heat pump circuit and list its applications.</li> <li>iii) Adiabatic saturation temperature.</li> <li>iv) Bapas factor.</li> </ul> </li> <li>b) Define the factors on which comfort feeling of people in A/C depends.</li> &lt;</ul> |  |  |  |

### 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]

Lieuronics and Communication Engineer

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 |

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(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 ho | urs M                                                                             | ax. Marks: 70      |
|------|--------|-----------------------------------------------------------------------------------|--------------------|
|      |        | Answer One Question from each Unit<br>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            |
| 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            |
| 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) Digital Video                                                                  | 7 Marks<br>7 Marks |
|      |        |                                                                                   |                    |
|      |        | UNIT-IV                                                                           |                    |
| 7    |        | Describe the steps in the JPEG Encoder with a block diagram.                      | 14 Marks           |
| 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 dat transmission. | a 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            |

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SVEC-14

(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 ho   | urs Max                                                                                                                                        | . Marks: 70         |
|------|----------|------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
|      |          | Answer One Question from each Unit<br>All questions carry equal marks                                                                          |                     |
|      |          |                                                                                                                                                |                     |
| 1    | a)<br>b) | Draw and explain System On Chip (SOC).<br>Explain skills required foe an embedded system designer.                                             | 7 Marks<br>7 Marks  |
| 2    |          | Describe design process in embedded system with an example.                                                                                    | 14 Marks            |
|      |          |                                                                                                                                                |                     |
| 3    | a)<br>b) | Explain different arithmetic and logic instructions in 8051 with examples.<br>Discuss about flags and register banks in 8051.<br>(OR)          | 10 Marks<br>4 Marks |
| 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)<br>b) | Describe memory management in RTOS.<br>Discuss about interrupt mechanism in RTOS.                                                              | 7 Marks<br>7 Marks  |
| 6    | a)<br>b) | Discuss on State Machine Programming Models with an example.<br>Illustrate the suitability of object oriented programming in embedded systems. | 7 Marks<br>7 Marks  |
|      |          | UNIT-IV                                                                                                                                        |                     |
| 7    | a)       | Discuss about the preprocessor global variable and preprocessor directives in<br>embedded programming                                          | 6 Marks             |
|      | b)       | Discuss about program elements in embedded programming.                                                                                        | 8 Marks             |
| 8    | a)       | Discuss about the advantages and disadvantages of C++ in embedded                                                                              | 6 Marks             |
|      | b)       | Discuss about sequential program model of AVCM.                                                                                                | 8 Marks             |
|      |          | UNIT-V                                                                                                                                         |                     |
| 9    | a)<br>b) | Discuss about simulators and laboratory tools.<br>Describe about linking and locating software's.                                              | 10 Marks<br>4 Marks |
| 10   | a)<br>b) | Distinguish between linkers and locators.<br>What is hardware software co-design? Explain in detail.                                           | 7 Marks<br>7 Marks  |
|      |          | \$\$ \$\$ \$                                                                                                                                   |                     |

SVEC-14

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

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

### SIMULATION AND MODELING

[ Computer Science and Engineering ]

Max. Marks: 70

Answer One Question from each Unit All questions carry equal marks

### UNIT-I

| 1  | a)<br>b) | Briefly explain simulation of inventory system.<br>Describe how arrays are used for List Processing.                                                                                                                                                                                                                                                                         | 7 Marks<br>7 Marks |
|----|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
|    | ,        | (OR)                                                                                                                                                                                                                                                                                                                                                                         |                    |
| 2  | a)<br>b) | Describe the issues in the evaluation and selection of simulation software.<br>Describe the time advance algorithm.                                                                                                                                                                                                                                                          | 7 Marks<br>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. (OR)                                                                                                                                                                                                                                                                                                                | 14 Marks           |
| 6  | a)<br>b) | Describe the steady state behavior of finite population model.<br>The malfunctions occur in a widget making machines follows Poisson process<br>with rate of malfunctions at 1.5 per hour. The repair times by the single<br>mechanic takes with mean time of 30 minutes and standard deviation of<br>20 minutes. What is the steady time average number of broken machines? | 7 Marks<br>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            |

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#### 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 CO1 7 Marks Context. b) Discuss the Henry Fayol principles of Management. CO<sub>2</sub> 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 "Product Layout is better than process Layout". Do You agree with this 3 a) CO1 7 Marks statement? Support your answer. The following information is about the shock absorbers used by CO4 7 Marks b) automobile workshop: Annual Demand - 4800 Units Unit Price: Rs.300/-Cost of Placing an Order - Rs.50/-Storage Cost 3% Per Annum Interest Rate 15% Per Annum. Calculate: i) EOQ. ii) How many orders to be placed? (OR) a) Define Marketing. Explain the functions of Marketing. 4. CO1 7 Marks b) For each of the 14 Days, a number of magnets used in electric relays are CO4 7 Marks 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. Day Number 1 2 3 4 5 6 7 8 9 10 11 12 13 14 Number of 100 150 50 200 150 50 80 120 60 14 50 70 40 140 Defectives (UNIT-III) Explain the nature and scope of HRM. 5. a) CO1 7 Marks What do you understand by Abraham Maslow's theory of Motivation? b) CO1 7 Marks (OR)a) Identify the role of HR Manager in an Organisation. CO1 7 Marks 6. Explain the methods of Job Evaluation. CO1 7 Marks b)

# 2

UNIT-IV

- 7. a) Define Entrepreneurship. Explain the Entrepreneurial Traits.
  - b) Consider the following activity:

| Activity                | Α  | В  | С    | D    | Е  | F    | G    | Н    | Ι    |
|-------------------------|----|----|------|------|----|------|------|------|------|
| Predecessor<br>Activity | -  | -  | A, B | A, B | В  | D, E | C, F | D, E | G, H |
| Time<br>(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.

| Activity | Normal Duration<br>(Days) | Normal Cost<br>(Rs/-) | Crash Time<br>(Days) | Crash cost<br>(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.
b) Discuss the concept of Six Sigma.
CO1 7 Marks
CO6 7 Marks
CO7 Marks
CO6 7 Marks

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14 Marks

CO4 7 Marks

7 Marks

CO5

CO4

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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 ]

|         | Electronics and first uncertation Engineering j                                                                                                    |            |             |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------|
| Time: 3 | <sup>3</sup> hours<br>Answer One Question from each Unit<br>All questions carry equal marks                                                        | Max        | . Marks: 70 |
|         | 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<br>CO2 | 14 Marks    |
|         |                                                                                                                                                    |            |             |
| 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<br>CO2 | 14 Marks    |
|         |                                                                                                                                                    |            |             |
| 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    |
|         |                                                                                                                                                    |            |             |
| 9.      | Elaborate on commercial Insurance Contracts.                                                                                                       | CO1<br>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<br>CO4 | 14 Marks    |

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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  |
|     |    |                                                                                                                   |     |          |
| 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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### 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<br>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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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

What do you mean by unilateral and bilateral methods of tolerancing? 1. CO1 7 Marks a) Explain with neat diagrams. Distinguish between clearance and allowance. CO1 7 Marks b) (**OR**) 2. A hole and mating shaft are to have a nominal assembly size of 55mm. 14 Marks CO<sub>2</sub> 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.

### UNIT-II

- With the help of neat sketches, explain how a sine bar is used to CO1 3. 7 Marks a) determine the taper angle of an inclined surface.
  - b) What is the working principle of LVDT? CO1 7 Marks
- Describe about mechanical comparator. Write the advantages and CO4 4. 14 Marks disadvantages of the mechanical comparator.

### UNIT-III)

5. In the measurement of surface roughness, heights of 20 successive peaks CO3 14 Marks 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.

#### (**OR**)

- Name the various numerical methods of assessment of surface finish. CO2 6. 7 Marks a) Explain them in detail with an example.
  - Describe the working principle of an auto collimator. 7 Marks b) CO5

### (UNIT-IV)

- Explain how effective diameter of screw thread is measured using three 7. CO2 7 Marks a) wire method. Include the sketches.
  - What is the "best size" wire? Derive an expression for the same in terms CO3 7 Marks b) of the pitch and angle of the thread.

#### (**OR**)

8. What are the different methods of measuring gear tooth thickness? CO5 14 Marks Explain the chordal thickness method. Sketch and describe how chordal thickness is measured using gear tooth vernier.

### 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 |  |  |  |  |

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

**REFRIGERATION AND AIR CONDITIONING** 

#### [Mechanical Engineering]

#### Time: 3 hours

#### **Answer One Question from each Unit** All questions carry equal marks

#### UNIT-I

An air refrigerator working on Bell-Coleman cycle takes air into the CO2 1. 14 Marks 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.

#### (OR)

- 2. a) What is refrigeration? Define one ton of refrigeration.
  - Determine the temperature ratio for a Carnot refrigerator whose C.O.P is 4. CO2 b) 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.

### UNIT-II )

3. A vapour compression refrigeration machine, with Freon-12 as refrigerant, CO2 14 Marks has a capacity of 12 tonne of refrigeration operating between -28°C and 26°C. The refrigerant is subcooled by 4°C before entering the expansion valve and the vapour is superheated by 5°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:

| Temperat<br>ure <sup>o</sup> C) | Pressure<br>bar | Sp.<br>Volume<br>of<br>vapour,<br>m3/kg | Liquid<br>heat<br>(kJ/kg) | Latent<br>heat<br>(kJ/kg) | Entrop<br>y of<br>liquid<br>(kJ/kg<br>K) | Entropy<br>of<br>Vapour<br>(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 CO1 6 Marks refrigeration system.
  - A refrigerating machine using NH3 operates between the temperature limits CO3 b) 8 Marks of -5°C and 30°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:

| Temperature<br>⁰C | Pressure<br>bar | Liquid<br>heat<br>(kJ/kg) | Latent<br>heat<br>(kJ/kg) | Entropy<br>of<br>liquid<br>(kJ/kg<br>K) | Entropy of<br>Vapour<br>(kJ/kg K) |
|-------------------|-----------------|---------------------------|---------------------------|-----------------------------------------|-----------------------------------|
| -5                | 2.41            | 351                       | 1667.5                    | 3.95                                    | 9.05                              |
| 30                | 11.895          | 562                       | 1711                      | 4.69                                    | 8.48                              |

1

Max. Marks: 70

7 Marks

7 Marks

CO1

### UNIT-III)

- i) Absorber.
- ii) Rectifier.
- iii) Analyser.
- iv) Heat exchangers.
- b) Derive an expression for the C.O.P. of an ideal vapour absorption system in CO3 7 Marks 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.

#### (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 CO1 8 Marks principle. What is the important role of hydrogen in this refrigeration system?

### UNIT-IV

- 7. The following data apply to an air conditioning system: CO6 14 Marks Room sensible heat=41868 kJ/hr room latent heat=41868 kJ/hr; inside design condition= 25°C, 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 10°C 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.

#### (OR)

- 8. a) Represent the following process in a skeleton psychometric chart. CO5 6 Marks
  - i) Sensible cooling.
  - ii) Cooling and humidification.
  - iii) Adiabatic mixing of air streams.
  - b) In a laboratory test a psychometer recorded 36°C DBT and 30°C WBT CO4 8 Marks 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.

### UNIT-V

- 9. a) What are the advantages and disadvantages of spray type dehumidifier over CO1 7 Marks a coil type dehumidifier
  - b) Explain the use of heat pump for heating and cooling cycle with neat CO1 7 Marks diagram

(OR)

- 10. a) What is effective temperature? How does it account for human comfort? CO1 7 Marks What is comfort equation?
  - b) What is the function of fan in air conditioning system? Explain the various CO1 7 Marks types of axial fans.

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### **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]

Max. Marks: 70

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

UNIT-I 1. List out the various forms of address in TCP Model and map them to OSI CO1 7 Marks a) Model layers. Compare the functionality of TCP/ IP over OSI Model. 7 Marks CO1 b) (OR)2. Explain the different methods of digital to analog representation methods CO1 14 Marks with neat sketches. UNIT-II ) 3. Explain the flow control protocols in a noise less channel. CO2 7 Marks a) Explain the concept of pure ALOHA with flow chart. **b**) CO2 7 Marks (**OR**) Calculate the hamming code for  $x^4+x^3+x+1$ . Assume even parity. 4. CO2 7 Marks a) List out the assumptions of dynamic channel allocation and explain each b) CO2 7 Marks in detail. UNIT-III) Draw the header format of IPv6 and explain each field. 5. CO2 8 Marks a) Compare the concept of virtual circuit and datagram subnets. CO2 6 Marks b) (**OR**) Describe the concept of class ful addressing in IPv4. CO3 6. a) 7 Marks Explain the transition strategies of logical addressing. CO3 7 Marks b) UNIT-IV) Draw the header format of UDP and explain each field in detail. 7. CO2 7 Marks a) Explain the concept of three-way handshaking in connection CO3 7 Marks b) establishment in TCP. (**OR**) Explain the concept of sliding window protocol in transport layer with CO3 8. 14 Marks and without errors UNIT-V 9 Explain the concept of DNS. CO27 Marks a) Describe the concept of web documents. CO3 7 Marks b) (**OR**) Explain in brief about the formats of HTTP request and response CO3 10. 7 Marks a) messages. b) What is a name server? List and explain the features of various name CO3 7 Marks servers.

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

### WEB TECHNOLOGIES

[Computer Science and Engineering]

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 |
|     |    |                                                                                           |     |         |

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

#### **COMPILER DESIGN**

#### [Computer Science and Engineering]

| Time | e: 3 ho | urs<br>Answer One Question from each Unit<br>All questions carry equal marks | Max. I | Marks: 70 |
|------|---------|------------------------------------------------------------------------------|--------|-----------|
|      |         | 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 CO1 8 Marks the use of sentinels can improve its performance?
  - 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 CO3 14 Marks construct a predictive parsing table for the following grammar:
  - $E \rightarrow T E^{I}$   $E^{I} \rightarrow + T E^{I} | \notin$   $T \rightarrow F T^{I}$   $T^{I} \rightarrow * F T^{I} | \notin$   $F \rightarrow (E) | id$

appropriate example.

#### (**OR**)

4. Convert the following grammar into LL(1) grammar and construct the CO3 14 Marks LL(1) Parsing table.
bexpr → bexpr or bterm | bterm
bterm → bterm and bfactor | bfactor
bfactor → not bfactor | ( bexpr) | true | false

### UNIT-III)

5. a) Write a note on the type equivalence using example. CO4 7 Marksb) What is a type conversion? Explain the type conversion with an 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 .

### UNIT-IV

Explain about Block and Non Block structure storage allocation for: CO6 14 Marks
 i) Dynamic scoping. ii) Parameter passing mechanisms.

#### (OR)

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- 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 CO2 7 Marks while(a > b)

### UNIT-V

- 9. a) What is a flow graph? Explain how a given program can be converted CO3 7 Marks into a flow graph.
  - b) What are the various machine dependent code optimization techniques? CO2 7 Marks

#### (**OR**)

10.Explain about Code-Generation algorithm.CO214 Marks

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#### 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

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 CO1 7 Marks Hosoor village. What is the process involved from sowing seeds to storage?
  - 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 CO4 7 Marks of infrastructure facilities. Choose the technology that can improve the rural infrastructure.
  - b) Write about various organizations related to innovation of technology for CO2 7 Marks rural development.

### UNIT-II

- 3. a) Day by day waste generation is increasing more and to minimize this CO4 7 Marks waste 3R principle use is necessary. What is meant by 3R principle? State the advantages of 3R principle.
  - b) Kumar is a young doctorate in mechanical engineering from NIT Tirchy CO4 7 Marks 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?

#### (OR)

- 4. a) The increase of wood waste and animal waste is more in the village CO4 7 Marks Ramapuram which is near to the forest area. Show how the waste can use by the rural people with the technology for cooking.
  - 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 CO4 7 Marks ornamental plant orchids can be increased by the plant tissue culture.
  - 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 CO1 14 Marks unemployed. Discus in detail the rural of cottage industries in rural development.

Max. Marks: 70

### UNIT-IV

- 7. a) Raghunath is an agricultural scientist wants to give awareness to the rural CO6 7 Marks people about the usage of organic fertilizers in the crop field. Suggest the importance uses of bio fertilizer.
  - 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 CO5 7 Marks need in community development.
  - b) Explain the importance of environment and sanitation in community CO4 7 Marks development.

### UNIT-V

9. a) What is meant by CSR? How development can be achieved with the CO3 7 Marks involvement of private sector participation in the rural area?

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 CO2 14 Marks applies its principle for a specific purpose.

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

#### **SOFTWARE TESTING** [Information Technology]

Time: 3 hours Max. Marks: 70 **Answer One Ouestion from each Unit** All questions carry equal marks UNIT-I 1. Differentiate error, bug, defect, fault, failure, testware and incident giving CO2 a) 7 Marks examples of each. List the states of software bug. b) CO1 7 Marks (**OR**) 2 Explain software testing methodology. CO1 7 Marks a) Describe about testing life cycle model. CO1 7 Marks b) UNIT-II Explain cyclomatic complexity in with example. 3. CO1 8 Marks a) Explain guidelines for basic path testing. b) CO1 6 Marks (**OR**) 4. Explain about the different criteria for logic coverage. CO1 8 Marks a) How do you calculate the number of decision nodes foe switch-case? 6 Marks b) CO1 (UNIT-III) 5. With a neat sketch, explain the decision table. 7 Marks a) CO1 A program calculates the total salary of an employee with the conditions CO3 7 Marks b) 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. (**OR**) What is an immaterial case? Explain its role in decision tables. 6. CO1 7 Marks a) b) List the steps involved in checking the consistency and completeness of CO2 7 Marks specifications using decision tables. UNIT-IV) 7. Illustrate the major activities in V and V planning. CO1 7 Marks a) Discuss the role of users/clients in preparing the test plans. CO1 7 Marks b) (**OR**) Justify the role of classifying software metrics on monitoring the progress CO4 8. 7 Marks a) of the software project. What type of projects can be best counted with function point analysis? CO1 7 Marks b) UNIT-V 9. With a neat diagram, explain the selective retest technique. a) CO1 7 Marks Design test cases by using regression testing to produce quality software. b) CO5 7 Marks (**OR**) 10. Implement data driven testing on flight reservation application using CO6 14 Marks regression testing tool.

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### 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.<br>Cycle model. Justify whether complete testing is possible or not. |     | 14 Marks |
|-----|----|-------------------------------------------------------------------------------------------------------------------------------------------------|-----|----------|
| 2   | `` |                                                                                                                                                 | 002 | 7 1 1    |
| 2.  | a) | List the goals of software testing                                                                                                              | CO2 | / Marks  |
|     | 6) | UNIT-II                                                                                                                                         | 02  | / Marks  |
| 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-     | 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                                                                     | CO3 | 7 Marks  |
|     | ,  | example.                                                                                                                                        |     |          |
|     |    | (OR)                                                                                                                                            |     |          |
| 6.  | a) | Explain Bottom-up Integration testing with suitable example and compare                                                                         | CO1 | 7 Marks  |
|     |    | it with Top-Down Integration.                                                                                                                   |     |          |
|     | 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                                                                      | CO5 | 7 Marks  |
|     |    | detail.                                                                                                                                         |     |          |
|     |    | (OR)                                                                                                                                            |     |          |
| 10. | a) | List the quality aspects of a website and perform performance testing for                                                                       | CO6 | 7 Marks  |
|     |    | it.                                                                                                                                             |     |          |
|     | b) | List and explain various guidelines Automated testing.                                                                                          | CO6 | 7Marks   |
|     |    |                                                                                                                                                 |     |          |

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

### **CLOUD COMPUTING**

[Computer Science and Engineering]

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.<br>i) Cloud Bursting.                                                                                         | CO4 | 14 Marks |
|     |    | <ul><li>ii) Load Balancing.</li><li>iii) Elastic Resource Capacity.</li></ul>                                                                                   |     |          |
|     |    | (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.  |    | 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<br>Relationship Management (CRM). Justify the above statement and list<br>few benefits of CRM. | CO6 | 14 Marks |

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SVEC-16

Time: 3 hours

(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 ho | urs                                                                                                            | 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?<br>(OR)                                                       | CO1  | 7 Marks   |
| 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)                                                                                                           |      |           |
| 5.   |        | 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                                                  | CO4  | 7 Marks   |
|      |        | Structures? Write the solution to overcome these flaws.                                                        |      |           |
|      |        | (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                                         | CO4  | 7 Marks   |
|      |        | responsibilities of these organization people.                                                                 |      |           |
|      |        | UNIT-V                                                                                                         |      |           |
| 9.   |        | Briefly explain Seven core metrics related to project control.                                                 | CO5  | 14 Marks  |
|      |        | (OR)                                                                                                           |      |           |
| 0.   |        | What are the roles of project manager in the agile management?                                                 | CO6  | 14 Marks  |
|      |        | କ୍ରେ କ୍ରେ                                                                                                      |      |           |

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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

### ESTIMATION AND QUANTITY SURVEYING

### [Civil Engineering]

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 CO4 14 Marks building from the given plan and cross section as shown in Fig.1. By using long wall and short wall method.
  - 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.



(OR)

- 2. a) Define estimate? List out the various quantity surveying for residential CO1 10 Marks building along with units.
  - b) Clearly distinguish between long wall and short wall method. CO1 4 Marks

- 3. a) Calculate the quantity of earth work for 350 meter length for a portion of CO4 8 Marks 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.
  - (i) Mid sectional area method
  - (ii) Prismoidal formula.
  - b) Calculate the quantity of cement concrete for cement concreting two CO2 6 Marks 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.

### (OR)

SVEC-16

| 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 $0.9m \times 0.8m$ , sand filling with 230mm depth around the pipe.                                                                                                                                                                                                                                                                         | CO2 | 14 Marks |
|----|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----------|
| 5. |    | Workout cost per unit for the following items of work.<br>i) Brick work in CM (1:6) for foundation.<br>ii) PCC in 1:3:6 for foundation.<br>iii) R.C.C for M20 grade concrete (1:1.5:3).<br>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 <sup>2</sup> . The plinth area of each story is 400m <sup>2</sup> . 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 <sup>2</sup> , other data required may be assumed suitably. | CO3 | 14 Marks |
|    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |          |

10. a)What do you mean by valuation and explain various purposes of valuation.CO110 Marksb)Explain capitalized value with example.CO84 Marks

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(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

### 

| 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  |  |  |  |
|     |          |                                                                                        |        |          |  |  |  |
| 5   | a)       | Explain the hardware and software components of GIS                                    | CO1    | 7 Marks  |  |  |  |
| 5.  | a)<br>b) | Distinguish between Raster GIS and Vector GIS                                          | $CO^2$ | 7 Marks  |  |  |  |
|     | 0)       | (OR)                                                                                   | 002    |          |  |  |  |
| 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. $\circledast \ \circledast \ \circledast$ | CO5    | 14 Marks |  |  |  |

### 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]

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 $8^{\circ}$ 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 $32.90^{\circ}$ C. 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 Marksb) Determine length of runway under standard conditions is 1900m the CO3 8 Marks
  - airport is to be provided at an elevation of 400m above the mean sea level. The airport reference temperature is 40°C. If the runway is to be constructed with an effective gradient of 0.4%, determine the corrected runway length.

### 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 |

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

#### **ADVANCED FOUNDATION ENGINEERING**

#### [Civil Engineering]

| Time | e: 3 ho  | urs                                                                                                                                                                                                                                                                                                                                                                              | 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 $2m \times 2m$ constructed on saturated clay.<br>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 $\gamma = 18$ kN/m <sup>3</sup> , C <sub>u</sub> = 60kN/m <sup>2</sup> and $\phi = 0^{\circ}$ . Estimate the ultimate bearing capacity of foundation.<br>Take F.S = 3. | CO2        | 6 Marks            |
|      |          | OR)                                                                                                                                                                                                                                                                                                                                                                              |            |                    |
| 2.   | a)<br>b) | Explain the 3-dimensional consolidation theory of settlements.<br>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<br>CO2 | 8 Marks<br>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 $C_n = 50 \text{kN/m}^2$ and $\gamma = 17.5 \text{kN/m}^3$ .                                                                                                                                                                            | CO2        | 6 Marks            |
|      |          | (OR)                                                                                                                                                                                                                                                                                                                                                                             |            |                    |
| 4.   | a)       | Explain the load carrying capacity of the pile by using $\alpha$ -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 $20^{\circ}$ , unit weigh of $19$ kN/m <sup>3</sup> . Determine the force developed in the tie rod placed at 1 m below the top of the surface.                                                                                                            | CO3        | 7 Marks            |
| 6    | 2)       | (UK)<br>With an aid of nost skatch combine the measure for determining the                                                                                                                                                                                                                                                                                                       | CO1        | 7 Marila           |
| 0.   | a)       | embedded depth required for a bulk head with fixed earth support.                                                                                                                                                                                                                                                                                                                |            | / Marks            |
|      | b)       | A cantilever sheet pile wall supporting a cohesive soil up to a height of 6 above the dredge level. The soil has $C_u = 35 \text{kN/m}^2$ and $\gamma = 17 \text{kN/m}^3$ . Determine the depth embedded. Take F.S = 1.                                                                                                                                                          | CO3        | 7 Marks            |
|      |          | ( IINTT-TV $)$                                                                                                                                                                                                                                                                                                                                                                   |            |                    |

#### <u> 11-11</u>

| 7. | a) | What is an expansive soil? Explain the foundation problems a | ssociated CO1 | 7 Marks |
|----|----|--------------------------------------------------------------|---------------|---------|
|    |    | with it.                                                     |               |         |
|    | b) | Explain about:                                               | CO4           | 7 Marks |

i) CNS layer.

ii) Classification of expansive soil.

### (OR)

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| 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- | CO1 | 7 Marks  |
|     |    | reamed pile foundation. Give out an expression for determining the load  |     |          |
|     |    | carrying capacity for a double bulb under-reamed pile foundation.        |     |          |
|     |    | 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    | CO2 | 7 Marks  |
|     |    | and wall type break water.                                               |     |          |
|     |    | (OR)                                                                     |     |          |
| 10. |    | Briefly explain the following terms:                                     | CO1 | 14 Marks |
|     |    | i) Quay walls. ii) Wharves. iii) Docks. iv) Piers.                       |     |          |

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

### ENVIRONMENTAL IMPACT ASSESSMENT AND MANAGEMENT

### [Civil Engineering]

| Time | : 3 ha | burs                                                                                                                                | Max. I | Marks: 70 |
|------|--------|-------------------------------------------------------------------------------------------------------------------------------------|--------|-----------|
|      |        | Answer One Question from each Unit<br>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  |
|      |        |                                                                                                                                     |        |           |

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### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

WATER RESOURCES SYSTEMS PLANNING AND MANAGEMENT

### [Civil Engineering]

Max. Marks: 70

Answer One Question from each Unit All questions carry equal marks

#### 

| 1. | a)<br>b) | Describe the concept of system analysis to water resources applications.<br>Explain the system approach to water resources system management.  | CO1<br>CO1 | 7 Marks<br>7 Marks |
|----|----------|------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|
|    |          | (OR)                                                                                                                                           |            |                    |
| 2. | a)       | What is the role of constraints in modeling of water resources systems?                                                                        | CO2        | 7 Marks            |
|    | b)       | Discuss the applicability of different optimization techniques used in water resources systems                                                 | CO2        | 7 Marks            |
|    |          | UNIT-II                                                                                                                                        |            |                    |
| 3. | a)       | Give a general mathematical formulation of LPP. Explain all terms.                                                                             | CO2        | 7 Marks            |
|    | b)       | Solve the following LPP by using graphical method.                                                                                             | CO4        | 7 Marks            |
|    | <i>.</i> | Maximize $\mathbf{Z} = 2\mathbf{x}_1 + 3\mathbf{x}_2$                                                                                          |            |                    |
|    |          | Subjected to constraints                                                                                                                       |            |                    |
|    |          | $2x_1 + x_2 \leq 2$                                                                                                                            |            |                    |
|    |          | $3x_1 + 4x_2 \ge 12$                                                                                                                           |            |                    |
|    |          | $\mathbf{x}_1, \mathbf{x}_2 \geq 0$                                                                                                            |            |                    |
|    |          | (OR)                                                                                                                                           |            |                    |
| 4. |          | Solve the following LPP.                                                                                                                       | CO4        | 14 Marks           |
|    |          | $Maximize \mathbf{Z} = \mathbf{x}_1 + 4\mathbf{x}_2$                                                                                           |            |                    |
|    |          | Subjected to constraints                                                                                                                       |            |                    |
|    |          | $3\mathbf{x}_1 + \mathbf{x}_2 \leq 3$                                                                                                          |            |                    |
|    |          | $2\mathbf{x}_1 + 3\mathbf{x}_2 \le 6$                                                                                                          |            |                    |
|    |          | $4\mathbf{x}_1 + 5\mathbf{x}_2 \geq 20$                                                                                                        |            |                    |
|    |          | $\mathbf{x}_1, \mathbf{x}_2 \geq 0$                                                                                                            |            |                    |
|    |          | (UNIT-III)                                                                                                                                     |            |                    |
| 5. | a)       | Explain Bellman's principle of optimality.                                                                                                     | CO5        | 7 Marks            |
|    | b)       | What is the role of dimensionality in dynamic programming problem.                                                                             | CO5        | 7 Marks            |
|    |          | (OR)                                                                                                                                           |            |                    |
| 6. |          | Solve the following 4-user water allocation problem to maximize the total returns using <b>backward recursion</b> of dynamic programming water | CO4        | 14 Marks           |

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.

| Allocation | Returns from |        |        |        |  |
|------------|--------------|--------|--------|--------|--|
| Anocation  | 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     |  |

1ax, wiaiks, 70

### (UNIT-IV)

7. Minimize  $Z=2x_1^2+x_2^2+3x_3^2+10x_1+8x_2+6x_3-100$ subject to  $x_1+x_2+x_3=20$  $x_1,x_2 \ge 0$ 

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 CO5 7 Marks planning?

UNIT-V

9. There are two alternatives to water supply in an irrigation district. Plan A CO8 14 Marks 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.

#### (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 CO6 7 Marks resources.

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#### 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]

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 CO1 7 Marks considered during the earthquake resistant design.
  - 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 CO2 7 Marks seismic analysis.
  - b) Explain about various classifications of earthquakes. Explain in detail CO1 7 Marks about magnitude and intensity of earthquakes.

### UNIT-II

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

iii) Critically damped system.

#### (OR)

- 4. a) Explain about the importance of ductility and what are the general CO4 7 Marks requirements of ductility.
  - 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 CO4 7 Marks in detail.
  - b) The plan and elevation of a 2, 3 story RCC college building. The building CO2 7 Marks 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<sup>2</sup> and Intensity of Live load of floors is 3kN/m<sup>2</sup>. Determine the design seismic loads on the structure by static analysis.



(OR)

- 6. For an RCC (OMRF, not conforming to ductile detailing requirements) CO1 14 Marks building frame for office the loads on the floors are DL (including equivalent weight of brick infill masonry  $8kN/m^2$  on each floor and  $7.5kN/m^2$  on roof, LL =  $4kN/m^2$  on each floor and  $1.5kN/m^2$  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  $20m \times 20m$  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.

- 7. a) Explain about the ductile detailing of beam as per IS 13920-2016 CO4 7 Marks recommendations.
  - b) An inner beam of 300mm x 600mm with span 6m of a RC frame having a CO1 7 Marks 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

#### (**OR**)

- 8. a) Explain about Plan Configuration and Torsion Irregularities in a multi CO6 7 Marks storied structure.
  - 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 CO3 7 Marks isolation technique.
  - b) Explain about Hydraulic dampers and Viscous dampers in detail. CO1 7 Marks

### (OR)

Design a ductile shear wall of an effective length 6.4m to resist seismic CO3 14 Marks 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.



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

#### HIGHWAY CONSTRUCTION AND MAINTENANCE

#### [Civil Engineering]

Max. Marks: 70

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

# (UNIT-I)

| 1.  | a)<br>b) | Explain various steps involved in the construction of WBM roads.<br>Explain the construction of cement concrete pavements in detail.                                        | CO2<br>CO2 | 7 Marks<br>7 Marks |
|-----|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|
| 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            |
| 3.  | a)<br>b) | Write a detailed note on soil-lime stabilization.<br>Write a detailed note on various special problems encountered during soil                                              | CO5<br>CO1 | 7 Marks<br>7 Marks |
|     |          |                                                                                                                                                                             |            |                    |
| 4.  | a)<br>b) | Explain the process of mechanical stabilization in detail.<br>Write a detailed note on various properties of soil aggregate mixes to be considered in soil stabilization.   | CO5<br>CO1 | 7 Marks<br>7 Marks |
|     |          | (UNIT-III)                                                                                                                                                                  |            |                    |
| 5.  | a)<br>b) | Explain the importance and various requirements of highway drainage.<br>Explain the construction of highway drainage in case of water logged areas                          | CO3<br>CO3 | 7 Marks<br>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.                                                                                        | CO5        | 14 Marks           |
|     |          | 1) Bull Dozer. 11) Scrapper.                                                                                                                                                |            |                    |
| 8.  |          | Discuss in detail various types of pile driving equipment available with neat sketch.                                                                                       | CO5        | 14 Marks           |
|     |          | UNIT-V                                                                                                                                                                      |            |                    |
| 9.  | a)<br>b) | Explain various failures in flexible pavements with neat sketch.<br>Write a detailed note on various ways to strengthen existing highway<br>pavements by means of overlays. | CO2<br>CO4 | 7 Marks<br>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            |
|     |          | \$P & \$P                                                                                                                                                                   |            |                    |

Time: 3 hours

Time: 3 hours

## **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]

Max. Marks: 70

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

| 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?<br>How does it help for the treatment of waste water? How the dissolved<br>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 <sup>3</sup> with MLSS concentration 2000 mg/l is maintained and the underflow concentration | CO2         | 7 Marks            |
|    |     | is 10000 mg/l and about 50m <sup>3</sup> /day sludge is wasted                                                                                                                                                   |             |                    |
|    |     | (OR)                                                                                                                                                                                                             |             |                    |
| 4  | a)  | Draw flow sheets and explain contact stabilization process                                                                                                                                                       | $CO^2$      | 7 Marks            |
| 1. | b)  | Explain the significant design criteria and steps for designing a                                                                                                                                                | CO2         | 7 Marks<br>7 Marks |
|    | ,   | conventional activated sludge process.                                                                                                                                                                           |             |                    |
|    |     | (UNIT-III)                                                                                                                                                                                                       |             |                    |
| 5. | a)  | What are the various empirical equations used for the design of                                                                                                                                                  | CO3         | 7 Marks            |
|    |     | trickling filters? State the limitations of these equations.                                                                                                                                                     |             |                    |
|    | 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                                                                                                                                          | CO3         | 7 Marks            |
|    |     | treatment is not generally accepted for wastewater treatment. Why?                                                                                                                                               |             |                    |
| 7. | a)  | What is the purpose of equalization? What are the methods of                                                                                                                                                     | CO4         | 7 Marks            |
|    | • ` | equalization and explain any two methods of mixing?                                                                                                                                                              | <b>GO</b> 4 | - > < 1            |
|    | 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            |
| 10. | a)<br>b) | Draw a neat sketch of the process of Tanneries Industry.<br>Give the values of different characteristics of Tanneries Industry waste. | CO5<br>CO5 | 7 Marks<br>7 Marks |

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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.<br>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<br>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 | CO33 | 14 Marks |
|    |    | box culvert assuming a super imposed dead load of 12kN/m <sup>2</sup> and a live                                                            |      |          |
|    |    | load of 50kN/m <sup>2</sup> . The density of the soil is 16kN/m. Use M 25 grade of concrete and Fe415 steel                                 |      |          |
|    |    | (OR)                                                                                                                                        |      |          |
| 4. |    | A road bridge deck consists of a reinforced concrete slab continuous                                                                        | CO3  | 14 Marks |
|    |    | 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.                                                                                               |      |          |
|    |    | (UNIT-III)                                                                                                                                  |      |          |
| 5. |    | Design a R.C.C. Tee beam and slab deck to suit the following data.                                                                          | CO5  | 14 Marks |
|    |    | 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 /0R tracked vehicle –                                                                             |      |          |
|    |    | materials, M20 grade concrete and Fe415 grade HYSD bars. Design the                                                                         |      |          |
|    |    | deck stab and draw the details of reinforcement.                                                                                            |      |          |
| 6  |    | (UK)<br>Design the interior slab panel of a T_beam bridge for the following data:                                                           | CO5  | 14 Marks |
| 0. |    | • Clear width of roadway = $7.5$ m                                                                                                          | 005  |          |
|    |    | • Span $C/C$ of hearings = 12m                                                                                                              |      |          |
|    |    | • Live load = IRC class $\Lambda\Lambda$ tracked vehicle                                                                                    |      |          |
|    |    | • Average thickness of wearing coat = 75mm                                                                                                  |      |          |
|    |    | • Use M 25 mix and Fe415 grades                                                                                                             |      |          |
|    |    | - 0.50 101 2.5 mills and 1 0+1.5 grades.                                                                                                    |      |          |

#### UNIT-IV) Write the different types of bearings used in the bridge. 7. CO1 4 Marks a) What is the purpose to provide the bearings in the bridge? CO1 4 Marks b) Compare the steel rock and roller bearing with elastometric bearing CO2 6 Marks c) along with the application. (**OR**) Write the general features of bearings used in the bridge. 8. a) CO1 7 Marks Explain design principles of steel rocker bearing. CO1 7 Marks b) UNIT-V Explain the various types loads and forces to be considered in the design 9. CO2 7 Marks a) of piers. Explain general features of a bed block. b) CO2 7 Marks (**OR**) 10. What are the materials used for piers and abatements mention them? CO1 5 Marks a) Explain briefly for the following forces acting on the abutments with CO2 9 Marks b) their design steps: i) Force due to breaking. ii) Active earth pressure.

iii) Horizontal force due to temperature and shrinkage.

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#### 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

#### **J** 1

#### UNIT-I Explain the impact at ground surface method of densifying granular soils. 1. CO1 7 Marks a) Explain the field procedure for compaction of soils. CO<sub>2</sub> 7 Marks b) (**OR**) Explain the construction methods used for the construction of stabilized CO1 2. 7 Marks a) roads. b) Differentiate between consolidation and compaction of soils and give CO4 7 Marks examples. UNIT-II 3. Explain the design steps for a dewatering system. CO3 7 Marks a) Explain the electro osmotic method of dewatering for ground CO1 b) 7 Marks improvement. (**OR**) Explain in detail the vacuum well point system of dewatering. 4. a) CO1 7 Marks Write a short note on following: CO1 7 Marks b) i) Preloading techniques. ii) Knitted. UNIT-III) 5. What is a stone column? What are the methods of installing a stone CO1 7 Marks a) column? Explain how the engineering properties of soil are changed by the process CO5 7 Marks b) of bituminous stabilization. (**OR**) Describe the vibroflotation technique of densifying granular soil. 6. CO6 7 Marks a) What are the types of vertical drains? Explain. 7 Marks b) CO1 (UNIT-IV) 7. Explain in detail the mechanical soil stabilization. CO1 7 Marks a) Explain the principle and application of soil-lime stabilization. b) CO5 7 Marks (**OR**) Explain in detail the different stages of grouting with the help of a neat 8. CO1 7 Marks a) sketch. Define grouting. What are the objectives of grouting in various Civil b) CO4 7 Marks engineering applications? UNIT-V What are the design principles of reinforced earth wall? 9. a) CO1 7 Marks Explain different functions of geo-textiles with neat sketches. 7 Marks b) CO6 (**OR**) Explain in detail the use of geo-synthetics as a reinforcement in various CO5 10. a) 7 Marks Civil engineering applications. Why geo-synthesis used in roadways on soft sub grades are more CO7 7 Marks b) beneficial? Explain

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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

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

# UNIT-I

- 1. a) Derive the condition for economical load dispatch among various CO2 7 Marks generating plants by considering transmission losses.
  - b) Explain the importance of load forecasting and explain any one method of CO1 7 Marks load forecasting.

#### (**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 CO6 7 Marks

$$\frac{df_1}{dpg_1} = 0.2pg_1 + 40 \qquad \frac{df_2}{dpg_2} = 0.25pg_2 + 30$$

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?

### UNIT-II)

- 3. a) Derive the coordination equation for the optimal scheduling of CO4 7 Marks hydrothermal interconnected power plants.
  - 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 CO4 14 Marks necessary equations.

# (UNIT-III)

- 5. a) Develop the mathematical model for the forward Dynamic programming CO2 8 Marks algorithm, taking into account the start up costs of the units
  - 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 CO1 8 Marks Priority list scheme based on simple shutdown algorithm.
  - 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 CO1 7 Marks explain its features.
  - b) Explain the block diagram representation of IEEE Type-1 excitation CO5 7 Marks system.

(OR)

Max. Marks: 70

8. Derive the transfer function of Generator – load model of power system 7 Marks CO2 a) Explain the block diagram of LFC system. CO1 b) 7 Marks UNIT-V 9. Derive dynamic response of a load frequency control of an isolated power CO2 7 Marks a) system. Draw a block diagram, with illustrative transfer function of a single area 7 Marks b) CO1 frequency control system. Explain the function of different components of such a control system. (**OR**) Derive the expression for the change in tie-line power when the loads 10. CO4 7 Marks a) change in the control areas. Two areas are connected with a tie line .The characteristics are as follows. b) CO6 7 Marks 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.

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Time: 3 hours

### **SREE VIDYANIKETHAN ENGINEERING COLLEGE**

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

# SWITCHGEAR AND PROTECTION

[Electrical and Electronics Engineering]

Max. Marks: 70

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

# UNIT-I

Elucidate the operation of Electromagnetic Induction disc type relay with CO2 1. 14 Marks relevant diagrams. Also derive the torque equation. (**OR**) 2. Elucidate the advantages of static relays over electromagnetic relays. CO1 7 Marks a) Draw the block diagram of Microprocessor based over current relay and b) CO<sub>2</sub> 7 Marks explain. UNIT-II Elucidate the operation of HRC fuse with diagram. 3. a) CO5 7 Marks Elaborate on the application of Air, Oil, Vacuum, SF6 circuit breakers. CO5 7 Marks b) (**OR**) 4. a) Elaborate arc interruption theories. CO1 10 Marks CO1 b) Analyze current chopping. 4 Marks UNIT-III) 5. Elaborate carrier current protection scheme for transmission line CO2 14 Marks protection. (**OR**) 6. Design a differential protection scheme for star-delta transformer. CO5 14 Marks UNIT-IV) 7. CO1 14 Marks Elucidate the causes of over voltages in power system. (**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 Elucidate grounding practice with diagram. CO6 7 Marks a) Discuss the advantages and disadvantages of ungrounded neutral systems. 7 Marks b) CO6 (j)

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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)<br>b) | Differentiate energy index and cost index.<br>Explain the different type of energy audits and procedures.                                                     | CO1<br>CO1 | 7 Marks<br>7 Marks |
|-----|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|
| 2.  | a)       | (OR)<br>Estimate energy saving potential in the following utilities.                                                                                          | CO3        | 8 Marks            |
|     | b)       | Explain the principles of energy management and various stages of energy management program.                                                                  | CO2        | 6 Marks            |
| 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           |
| 1   | a)       | (OR)                                                                                                                                                          | CO2        | 7 Mortra           |
| 4.  | a)       | explain its benefits.                                                                                                                                         | 02         | / IVIAIKS          |
|     | b)       | Explain the role of Energy Managers in Industries.                                                                                                            | CO1        | 7 Marks            |
| 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. <b>(OR)</b>                                                                                       | CO5        | 8 Marks            |
| 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.                                                                            | CO1        | 9 Marks            |
|     |          | i) Simple interest calculation.                                                                                                                               |            |                    |
|     |          | ii) Compound interest calculation.                                                                                                                            |            |                    |
|     |          | iii) Single sum cash flows.                                                                                                                                   |            |                    |
|     |          | 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. (OR)                                                                                                     | CO2        | / Marks            |
| 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            |

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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

| 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 |
|     |    |                                                                                                                |     |         |
| 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.<br>(OR)                                  | CO2 | 7 Marks |
| 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 |
| 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 |
| 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 | / Marks |
| 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. (OR)                                                     | CO2 | 7 Marks |
| 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 |
|     |    | \$\$ \$\$ \$\$                                                                                                 |     |         |

Time: 3 hours

#### 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]

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 nower system operation                                                                                       | CO1         | 5 Marks            |
|-----|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------------|
|     | b)       | Describe different modes of operation of power systems.                                                                                                                           | CO1         | 9 Marks            |
| 2.  | a)       | Describe the function of supervisory control systems in power system<br>operator process interaction                                                                              | CO2         | 7 Marks            |
|     | b)       | Explain the power system operator activities in detail.                                                                                                                           | CO1         | 7 Marks            |
| 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            |
| 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            |
| 5.  | a)<br>b) | Explain the layout of conventional substation and its wiring requirements.<br>Describe the integrated protection functions via hard wiring and LAN with their neat diagrams.      | CO1<br>CO5  | 7 Marks<br>7 Marks |
| 6   |          | (OR)                                                                                                                                                                              | ao <b>-</b> |                    |
| 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            |
| 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. <b>(OR)</b>                                                                                                           | CO5         | 6 Marks            |
| 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            |
| 9.  | a)<br>b) | Describe the operational planning activities of ISO in pool based market.<br>Explain various advantages of deregulated power systems over vertically<br>integrated power systems. | CO2<br>CO1  | 8 Marks<br>6 Marks |
|     | ,        | (OR)                                                                                                                                                                              | ~ ~ •       |                    |
| 10. | a)<br>b) | Describe the types of restructuring models in detail.<br>Discuss about power exchange and market operations in detail.                                                            | CO2<br>CO1  | 6 Marks<br>8 Marks |
|     |          |                                                                                                                                                                                   |             |                    |

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

# ANALYSIS OF POWER ELECTRONIC CONVERTER

#### [Electrical and Electronics Engineering]

Max. Marks: 70

Time: 3 hours

#### 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  |
| 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,<br>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 $R = 10\Omega$ . If it is required to obtain an average output voltage of 50% of the maximum possible output voltage, calculate (i) the delay angle $\alpha$ , (ii) the r.m.s and average output currents, (iii) the TUF and (iv) the input PF. | CO8         | 8 Marks  |
| -  |    |                                                                                                                                                                                                                                                                                                                                                                             | 000         |          |
| 1. | 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 $R = 500\Omega$ and the peak-to-peak                                                                                                                                                                                                                     | CO4         | 8 Marks  |

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.

(OR)

8. Design a suitable converter for Cuk Converter operation. Explain its CO2, 14 Marks modes of operation with neat circuit diagram and relevant waveforms. CO4 Also deduce the condition for continuous inductor current and capacitor voltage.

# UNIT-V

9. a)Discuss about Selective Harmonic Elimination PWM technique.CO67 Marksb)Compare various advanced PWM techniques.CO37 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 CO3 7 Marks inverter.

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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. Discuss the responsibilities of suppliers and end users of electrical power. CO1 7 Marks a) Explain the use of setting standards to power quality. Name any Five b) CO1 7 Marks power quality standers. (**OR**) Define power quality. With neat sketches, explain the different types of CO1 8 Marks 2. a) power quality problems. Discuss in detail about the Computer Business Equipment Manufacturer's 6 Marks b) CO1 Association (CBEMA). Explain about the events described in the curve. (UNIT-II) 3. Discuss the following electrical power quality terms: CO2 14 Marks i) Notching. i) ii) Inter-Harmonics. ii) iii) Voltage fluctuations. iii) iv) Waveform distortion. iv) v) Short-duration variation. v) (**OR**) 7 Marks 4. Define waveform distortion. Explain the wave form distortion categories. CO<sub>2</sub> a) b) List out general mitigation methods for number of faults and fault CO1 7 Marks clearing time can be reduced. (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. CO2 14 Marks i) impact on capacitors. ii) impact on transformers. iii) impact on motor. iv) impact on telecommunications. v) impact on energy and demand metering. UNIT-IV) 7. Illustrate how the locations will be choosing for power quality CO4 7 Marks a) monitoring. Elucidate the historical perspective of power quality measuring CO5 7 Marks b) instruments in power system. (**OR**) 8. Identify the suitable power quality monitoring and measuring device to CO4 8 Marks a) measure flicker and explain with functional blocks.
  - b) Tell the importance of power quality monitoring standards in power CO1 6 Marks system and list them.

# UNIT-V

9. Elucidate in detail about the distributed generation and its impacts on the CO6 14 Marks network.

# (OR)

10. Discuss about following of distributed generation.

CO5 14 Marks

- i) Islanding issues.
- ii) Distribution line compensation.
- iii) Heavy load and light load connection.
- iv) Real generation.
- v) Protection issues.

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Time: 3 hours

# 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]

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 |
| 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 |
| 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 |
| 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.<br>(OR)                                                     | CO4  | 7 Marks |
| 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, | 7 Marks |
|     |     |                                                                                                                                | CO5  |         |
|     | b)  | Discuss about the need of cloud computing and its properties.                                                                  | CO4  | 7 Marks |
|     |     |                                                                                                                                |      |         |

**Time: 3 hours** 

# 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]

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<br>when all the inputs are presented only one time. Use bipolar inputs and<br>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.  |    | 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) using.<br>i) Max-min composition.<br>ii) Max-product composition.<br>$\vec{R} = \begin{bmatrix} 0.6 & 0.3 & 0.5 \\ 0.5 & 0.5 \end{bmatrix}$<br>$\vec{S} = \begin{bmatrix} 0.9 & 0.5 \\ 0.5 & 0.5 \end{bmatrix}$ | CO4 | 8 Marks  |
|     |    |                                                                                                                                                                                                                                                                                 |     |          |
|     |    | (OR)                                                                                                                                                                                                                                                                            |     |          |
| 8.  |    | Demonstrate the following:<br>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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#### 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 CO1 14 Marks with a neat sketch

#### (**OR**)

- 2. Explain briefly the function and arrangement of lubricating oil filters. CO2 7 Marks a)
  - Explain the factors that limit the extent of supercharging of S.I and C.I 7 Marks b) CO2 engines.

# UNIT-II

3. List out the functions of ignition system and explain the working of CO1 14 Marks battery ignition system with a neat diagram.

#### (**OR**)

Name different methods of engine cooling. Explain air-cooling method in CO3 4. 14 Marks detail.

# UNIT-III)

5. Explain about the engine emission control by three-way catalytic CO4 14 Marks converter system in detail.

#### (**OR**)

Enumerate various techniques of pollution control in CI engines. In what 6. CO6 14 Marks way it follows national standards? What benefit it has on the environment?

# UNIT-IV

7. Sketch and explain Davis steering mechanism. CO<sub>4</sub> 14 Marks

(**OR**)

- Explain the necessity of clutches in automobile. Suggest some design CO3 8. 7 Marks a) changes in clutch system to improve transmission efficiency.
  - Illustrate the working of universal joints used in automobiles with a neat CO1 7 Marks b) diagram.

# UNIT-V

9. Differentiate independent suspension system and rigid axle suspension CO5 14 Marks system with suitable example.

#### (**OR**)

10. Classify various brakes used in automobiles. Discuss the working of CO1 14 Marks hydraulic brake with a neat sketch.

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SVEC-16

Time: 3 hours

## **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]

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  $P = 200 \times 103$  N is applied as CO1 14 Marks shown. Calculate the nodal displacements.



- 3. a) Write load vector for 2 noded beam elements.
  - b) Determine the deflection at the point of load application using one element CO2 12 Marks model shown in Fig.2.



4. Derive element stiffness matrix for 2 noded beam elements. CO2 14 Marks

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SVEC-16

CO2 2 Marks

# UNIT-III

- 5. a) Derive strain displacement B matrix for CST element. CO3 10 Marks
  - b) Determine the Jacobian for the  $(x, y) (\xi, \eta)$  transformation for the element CO3 4 Marks shown in Fig.3.



6. An axisymmetric body with a linearly distributed load on the conical surface CO3 14 Marks is shown in Fig.4. Determine the equivalent point loads at nodes 2, 4 and 6.



- 7. a) Write short notes on sub parametric, super parametric and iso parametric CO4 7 Marks elements.
  - 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 CO4 14 Marks and 1cm thick plaster. If the temperature on wood and plaster faces are 20°C and -20°C 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<sup>2</sup>K.

# UNIT-V

9. Determine the Eigen values and Eigen vectors for the stepped bar shown in 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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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 pro | blem through graphically      | CO1 | 14 Marks |
|----|---------------------|-------------------------------|-----|----------|
|    | Max $Z=3X_1$        | +5X2                          |     |          |
|    | Subject to          | $X_1 + 2X_2 \le 2000$         |     |          |
|    |                     | $X_1 - X_2 \le 1500$          |     |          |
|    |                     | $X_2 \le 600, X_1, X_2 \ge 0$ |     |          |
|    |                     | (OR)                          |     |          |
| 2. | Solve following pro | blem through BIG-M method     | CO2 | 14 Marks |
|    | $Min Z = X_1 + I$   | X <sub>2</sub>                |     |          |
|    | Subject to          | $2X_1 + X_2 \ge 4$            |     |          |
|    |                     | $X_1 + 7X_2 \ge 7$            |     |          |
|    |                     | $X_1, X_2 \ge 0$              |     |          |

A manufacturer has distribution centers at X, Y and Z. These centers have CO4 3. 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.

| Distribution |    | Retail Outlets |     |    |    |  |  |  |  |  |
|--------------|----|----------------|-----|----|----|--|--|--|--|--|
| Center       | Α  | A B C D E      |     |    |    |  |  |  |  |  |
| Х            | 55 | 30             | 40  | 50 | 50 |  |  |  |  |  |
| Y            | 35 | 30             | 100 | 45 | 60 |  |  |  |  |  |
| Z            | 40 | 60             | 95  | 35 | 30 |  |  |  |  |  |

(**OR**) Company has 4 jobs to be done. The following matrix shows the return in CO3 4. 14 Marks rupees on assigning machines to jobs. Assign 4 jobs to 4 machines so as to maximize the total expected profit.

|    |   |    | Macl  | nines        |    |
|----|---|----|-------|--------------|----|
|    |   | Α  | В     | С            | D  |
|    | 1 | 32 | 35    | 40           | 28 |
| bs | 2 | 40 | 25    | 30           | 22 |
|    | 3 | 42 | 27    | 34           | 30 |
|    | 4 | 25 | 39    | 41           | 35 |
|    |   | (  | UNIT- | <b>III</b> ) |    |

Jo

5. Find solution to the game whose payoff matrix for player A is given CO6 14 Marks below.

|          | Player-B |     |    |  |  |
|----------|----------|-----|----|--|--|
|          | -3       | -2  | 6  |  |  |
| Player-A | 2        | 0   | 2  |  |  |
|          | 5        | -2  | -4 |  |  |
|          | (        | OR) |    |  |  |

14 Marks

6. Solve the following game whose payoff matrix for player-A is given below CO6 14 Marks and find the solution to the game.



7. Draw the PERT network for the activities whose three time estimates are CO5 14 Marks 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.

| Activity | Optimistic<br>time (days) | Most likely<br>time (days) | Pessimistic<br>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                          |

#### (**O**R)

8. The activities involved in Alpha Garment Manufacturing Company are listed CO5 14 Marks 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.

| Activity | Precedence | Duration |
|----------|------------|----------|
| А        | -          | 10       |
| В        | -          | 7        |
| С        | А          | 5        |
| D        | С          | 3        |
| Е        | D          | 2        |
| F        | B,E        | 1        |
| G        | F          | 14       |
|          |            | ·-v )    |

9. The demand per day for a belt used in an engine of automobile has the CO5 14 Marks 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.

| 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 CO3 14 Marks 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?

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

#### CRYOGENICS

#### [Mechanical Engineering]

Time: 3 hours Max. Marks: 70 **Answer One Ouestion from each Unit** All questions carry equal marks UNIT-I 1. Discuss methods to produce low temperatures. CO1 14 Marks  $(\mathbf{OR})$ 2. How a cascade system can be used to produce liquid Nitrogen? Discuss. CO<sub>2</sub> 14 Marks UNIT-II 3 Outline thermal properties of material at cryogenic temperatures. CO1 7 Marks a) Explain super fluidity with the help of neat diagrams. CO3 7 Marks b) (**OR**) Explain the working of cryogenic refrigeration system with its schematic 4. CO<sub>2</sub> 14 Marks and T-S diagrams. (UNIT-III) 5. Explain the working of liquification system for inert gases. a) CO<sub>2</sub> 7 Marks Derive the minimum work required for liquification. CO3 7 Marks b) (**OR**) Illustrate the working of a system used for the production of dry-ice. "The 6. CO4 14 Marks production of dry-ice is more difficult in hot summer compared with winter" - Discuss in detail. UNIT-IV Write briefly on production of low temperatures. 7. CO1 7 Marks a) Explain with proper reasoning and graph, the effect of low temperature on 7 Marks b) CO4 two mechanical and two thermal properties of engineering materials. (**OR**) 8. Explain applications of low temperature in detail. CO5 14 Marks UNIT-V 9. Explain about Dewar vessels. CO5 7 Marks a) Discuss the hazards in cryogenic engineering. CO5 7 Marks b) (**OR**) Why insulations are required for Cryogenic systems? Explain the various 10. CO5 14 Marks types of insulations used. Explain about multi-layer insulation with their applications.

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

#### **OUALITY 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

- Explain the sequential steps and stages involved in ISO 9000 certification CO1 1. 7 Marks a) for Indian Firms.
  - What is meant by cost of quality? Explain the components of cost of CO1 7 Marks b) quality.

#### (OR)

2. Explain the Salient features of implementing POKA – YOKE. CO6 7 Marks a)

b) Explain the secrets and steps towards establishing a successful Quality CO1 7 Marks Circle (QC) program in a Firm.

# UNIT-II

- Define control chart and state the objectives of Mean and Range charts. 3. CO5 7 Marks a)
  - What is meant by process capability? How will you determine the same? CO5 7 Marks b) (**OR**)

#### 4. The cloth of the ABC manufacturer was inspected 100 square meters is CO5 14 Marks taken as unit. The following defects per unit were recorded.

|                             |   |   |   | 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)

- Write the advantages and disadvantages of sampling plans. 7 Marks 5. a) CO<sub>2</sub>
- b) Draw neat sketch of OC curve and explain its various parameters. CO2 7 Marks

#### (OR)

Explain the effect of sample size and acceptance number on OC curve. 6. a) CO<sub>2</sub> 4 Marks A shipment of 2,000 portable battery units for microcomputers is about to CO2 10 Marks b) 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  $c \le 3$  defectives. Both firms want to know if this plan will satisfy their quality and risk requirements.

# UNIT-IV

#### Elaborate various configurations of system reliability. 7. CO<sub>4</sub> 7 Marks a) b)

Explain the various types of Failure – Hazard models. CO3 7 Marks

# (**OR**)

8. 14 Marks A System contains series string of components for which  $\Sigma \lambda = 0.005$  f/hr. CO4 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.

# UNIT-V

| 9.  | a) | Explain Active and Standby Redunda     | ancies.           | 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. | , <u> </u>        | CO4 | 7 Marks |
|     |    | 5 1                                    |                   |     |         |
|     |    |                                        |                   |     |         |

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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 CO1 14 Marks according to the coordinate system.

#### (OR)

2. Explain mechanical grippers and their linkage mechanisms with neat CO1 14 Marks sketches.

# UNIT-II

3. Explain the various drive system used with an industrial robot and CO2 14 Marks compare their features, merits and demerits.

#### (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.
b) Derive the forward kinematic equations using Denavit-Hartenberg CO3 7 Marks notation for a three-link planner manipulator.

#### (OR)

6. Determine the equations of motion for 2-RR planar manipulator using CO3 14 Marks Lagrange-Euler formulation.

# UNIT-IV

| 7. | a) | Discuss different features of trajectory planning in robots and their | CO4 | 7 Marks |
|----|----|-----------------------------------------------------------------------|-----|---------|
|    |    | significance.                                                         |     |         |
|    | b) | Explain skew motion in detail.                                        | CO4 | 7 Marks |

#### (OR)

- 8. a) Briefly explain the working principle of any two types of position sensors CO4 7 Marks with neat sketch.
  - 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 CO5 7 Marks programming:
  - i) Robot configuration control.
  - ii) Motion control.

# (OR)

10. a) Discuss robot application for assembly and inspection.
b) Describe briefly the operations involved in robotic spot welding. What are CO5 7 Marks the advantages of robotic welding over manual welding?

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

#### **PRODUCTION AND OPERATIONS MANAGEMENT**

#### [Mechanical Engineering]

Time: 3 hours

6.

Max. Marks: 70

7 Marks

14 Marks

CO3

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

# UNIT-I

 a) Discuss briefly Operations Management with block diagram.
 b) Write a brief notes on Historical Development of Operations CO2 7 Marks Management.

#### (OR)

2. a) Explain in brief the factors affecting productivity.

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 CO3 14 Marks absolute deviation, mean square error, mean forecast error and mean absolute percentage error for the following problem.

| Time<br>(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 CO3 14 Marks absolute deviation, mean square error, mean forecast error and mean absolute percentage error for the following problem.

| Time<br>(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 |
|                  |    |     |    |     |    | NIT | -111 | $\overline{\mathbf{D}}$ |     |     |    |    |

5. Estimate the total production cost by using **Hiring and Firing Strategy** CO1 14 Marks 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.

|                 | JAN | FEB | MAR  | APR  | MAY  | JUN  |
|-----------------|-----|-----|------|------|------|------|
| Demand Forecast | 900 | 700 | 800  | 1200 | 1500 | 1100 |
| Working Days    | 22  | 18  | 21   | 21   | 22   | 20   |
|                 |     |     | (OR) |      |      |      |

Estimate the Total production cost by using **Constant work force** CO1 **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

|                 | 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 CO1 14 Marks block Diagram.

# (OR)

8. Enumerate the concepts of Enterprise resource planning, Just-in-Time, CO1 14 Marks Kaizen, Pull method of materials flow and Preventive maintenance.

# UNIT-V

9. What is the purpose of Gantt chart and solve the 2-Machine and n-Jobs CO6 14 Marks problem by using Johnson's Algorithm.

| 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 CO6 14 Marks  $I \rightarrow II \rightarrow III \rightarrow IV \rightarrow V$ . 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.

|      | Machines |    |    |     |    |    |  |  |
|------|----------|----|----|-----|----|----|--|--|
|      |          | Ι  | II | III | IV | V  |  |  |
|      | 1        | 11 | 14 | 17  | 10 | 19 |  |  |
|      | 2        | 12 | 14 | 16  | 13 | 17 |  |  |
| Jobs | 3        | 17 | 12 | 11  | 15 | 19 |  |  |
|      | 4        | 16 | 16 | 12  | 12 | 21 |  |  |
|      | 5        | 14 | 16 | 10  | 11 | 19 |  |  |
|      | 6        | 15 | 14 | 13  | 16 | 26 |  |  |

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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 CO1 14 Marks sketch.

#### (**OR**)

2. a) Explain different types of dust collectors used in thermal power plant.
b) Enumerate and explain the steps involved in coal handling.
CO1 7 Marks
CO1 7 Marks

## (UNIT-II)

3. List the essential components of a diesel power plant and explain them CO2 14 Marks briefly.

# (OR)

4. Explain the working details of gas turbine power plant with its layout CO2 14 Marks indicating all auxiliaries.

#### (UNIT-III)

- 5. a) What are typical ponds and storage units suitable for installation of hydro- CO3 7 Marks electric power plants? Explain them.
  - b) What is the importance of spill ways in hydro-electric power projects? CO2 7 Marks Explain their practical applications.

#### (**OR**)

- 6. a) Explain the construction and working of the pressurised water reactor CO2 7 Marks nuclear power plant with a layout.
  - b) Discuss the characteristics of hydrographs with respect to the power CO3 7 Marks generation along with the suitable curves.

#### (UNIT-IV)

7. Explain the working of magneto hydrodynamics system with a schematic CO2 14 Marks layout.

#### (OR)

- 8. a) How to make use of solar energy for the generation of power? Discuss the CO4 7 Marks merits and demerits.
  - b) How to make use of the tides for power generation based on their CO4 7 Marks capacities? Explain the principle of operation.

# UNIT-V

9. The data for a 2000 kW diesel power plant is as follows: CO6 14 Marks 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.

#### (OR)

10. a)Briefly explain various methods of reducing thermal pollution.CO57 Marksb)Discuss the pollution due to nuclear power plant.CO57 Marks

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# 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 <sup>th</sup> 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 <b>n</b> .                                                                                        | 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,<br>mobile antenna height is 3m and path length is 5km, find:<br>i) Incident angle. ii) Elevation angle. | CO3 | 7 Marks |
|    | b) | Explain long distance propagation and point to point prediction model.                                                                                                             | CO3 | 7 Marks |
|    |    |                                                                                                                                                                                    |     |         |
| 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:                                                                      | CO6 | 7 Marks |
|-----|----|--------------------------------------------------------------------------------------------|-----|---------|
|     |    | i) Upper layer.                                                                            |     |         |
|     |    | ii) W-CDMA.                                                                                |     |         |
|     | 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

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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** 

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

## UNIT-I

1. Write a detailed note on functional block diagram of MSP430 CO1 14 Marks microcontroller and explain the various languages used to program the microcontrollers. (**OR**) 2. Explain the memory map of the MSP430 microcontroller. CO<sub>2</sub> 7 Marks a) Write a brief note on Interrupts and Resets. CO2 7 Marks b) UNIT-II ) Explain the registers in the CPU of MSP430 microcontroller and 3. CO5. 14 Marks operation of the stack in the MSP430 microcontroller. CO1 (**OR**) Explain the Register mode and Indirect Register mode with examples. 7 Marks 4. a) CO5 b) Reproduce the condition code/status register contents of MSP430. CO5 7 Marks

#### (UNIT-III)

Write a program for interfacing LED with MSP430 microcontroller. CO5 7 Marks 5. a)

- CO5 Explain how to control the Clock Module through the status register. 7 Marks b) (**OR**)
- Write a program to copy string from one location in memory to another CO3 6. 7 Marks a) memory location.
  - b) Explain how to use the subroutines in embedded programming with an CO3 7 Marks example.

# UNIT-IV )

Explain the use of WDT and associated WDTCTL register format. 7. CO4 7 Marks a) Write a brief note on non-maskable interrupts and the shared data CO4 b) 7 Marks problem.

#### (**OR**)

8. With a neat sketch, explain the architecture of comparator A. CO5 7 Marks a) Explain the operation of Successive-Approximation ADC. b) CO5 7 Marks UNIT-V

#### Write a brief note on Finite State Machines. 9. CO6 7 Marks a) Write a detailed note on IOT communication models. CO6 b) 7 Marks (**OR**)

#### 10. Write a short note on Data path architecture. CO6 7 Marks a) List the privacy considerations and interoperability issues to be CO6 7 Marks b) considered while developing IOT devices.

ත Ca. R Max. Marks: 70

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

#### **MICROWAVE ENGINEERING**

[Electronics and Communication Engineering]

Max. Marks: 70

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

# UNIT-I

| 1. | a)<br>b) | Discuss the measurement of scattering parameters of a network<br>A 10mw signal is applied to a 20dB directional coupler. Determine the<br>power available at the coupled port.                                     | CO1<br>CO2 | 7 Marks<br>7 Marks |
|----|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|
| 2. | a)       | (OR)<br>What is ferrite device? Discuss in detail about circulator with neat                                                                                                                                       | CO1        | 7 Marks            |
|    |          | diagram.                                                                                                                                                                                                           | ~ ~ .      |                    |
|    | b)       | State and find the reciprocal condition in terms of S-parameters for a two<br>port network ?                                                                                                                       | COI        | 7 Marks            |
|    |          | (UNIT-II)                                                                                                                                                                                                          |            |                    |
| 3. | a)       | A two cavity Klystron amplifier has the following specifications.                                                                                                                                                  | CO4        | 7 Marks            |
|    |          | Beam voltage $V_0$ = 900V, Beam current $I_0$ = 30mA, frequency f = 8GHz,                                                                                                                                          |            |                    |
|    |          | Gap spacing in either cavity $d = 1$ mm cavity, Spacing between centers of                                                                                                                                         |            |                    |
|    |          | cavities $L = 4$ cm, Effective shunt impedance $R_{sh} = 49G\Omega$ . Determine:                                                                                                                                   |            |                    |
|    |          | i) The electron velocity.                                                                                                                                                                                          |            |                    |
|    |          | 11) The dc transit time of electron.                                                                                                                                                                               |            |                    |
|    |          | iv) The voltage gain in decibels                                                                                                                                                                                   |            |                    |
|    | h)       | Explain the limitations of conventional tubes                                                                                                                                                                      | CO1        | 7 Marks            |
|    | 0)       | (OR)                                                                                                                                                                                                               | 001        |                    |
| 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 $20\mu m$ , the drift velocity of electrons                                                                                                                                  | CO3        | 7 Marks            |
|    |          | is 2 x $10^7$ cm. Calculate the rational frequency and critical voltage of the diode.                                                                                                                              |            |                    |
|    |          | UNIT-IV                                                                                                                                                                                                            |            |                    |
| 7. | a)       | Calculate the VSWR of a transmission system operating at 20GHz TE <sub>10</sub>                                                                                                                                    | CO4        | 7 Marks            |
|    |          | mode is propagating through waveguide of dimension $(6.4 \times 3.2)$ cm <sup>2</sup> . The distance between two successive minima is 1.6mm.                                                                       |            |                    |
|    | 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)

Time: 3 hours
- 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 CO3 8 Marks of unknown load impedance using slotted line.

## UNIT-V

9. a) Explain in detail about space wave propagation.
b) The observed critical frequencies of E and F layers at Guwahati at CO5 8 Marks particular times are 2.5MHz and 8.4MHz respectively. Calculate the

# maximum electron concentrations of the layers. (OR)

- 10. a) Explain about effect of the earth's magnetic field on ionosphere radio CO6 6 Marks wave propagation.
  - b) Define radio horizon and calculate its value. What is the radio horizon of CO5 8 Marks 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?

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

#### SATELLITE COMMUNICATIONS

[Electronics and Communication Engineering]

Time: 3 hours

#### **Answer One Ouestion from each Unit** All questions carry equal marks

#### UNIT-I

- With the help of block diagram, demonstrate the operation principle in CO1 1. a) 8 Marks satellite communication system.
  - Write about satellite frequency band designation and associated CO1 6 Marks b) applications.

#### (**OR**)

- 2. Derive the elevation and azimuth angles for geo-stationary satellites with CO2 8 Marks a) necessary equations.
  - A satellite is in a 322 km high circular orbit. Assuming average radius of CO4 6 Marks b) 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.

#### UNIT-II

Enumerate the steps involved while designing a satellite communication CO3 3. 8 Marks a) link.

Explain with neat sketch. CO1 b)

- i) Earth station receiver.
- ii) Earth station transmitter.

#### (**OR**)

- 4. Derive an expression for the orbital period of circular orbit by considering CO2 8 Marks a) Newton's Laws of motion and gravitation.
  - The earth rotates once per sidereal day of 23 h 56 min 4.09 secs. Show CO4 6 Marks b) that the height of Geo-synchronous orbit is about 36,000 kms.

#### UNIT-III)

- Discuss briefly how the demand assignment may be implemented in a 5 CO5 8 Marks a) TDMA network. What is the advantage of TDMA over FDMA in this respect?
  - CO1 Mention in detail about various satellite codes. 6 Marks b)

#### (OR)

- 6. Discuss the basic types and relationships of satellite antennas. 7 Marks CO1 a)
  - Write a short note on AOCS (Altitude and Orbit Control System) of a CO1 7 Marks b) satellite.

### UNIT-IV)

7. Analyze and discuss the Delay and Throughput considerations in a CO2 7 Marks a) satellite system.

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b) Summarize the advantages and disadvantages of low and medium earth CO1 7 Marks orbits.

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Max. Marks: 70

6 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.
9. a) Explain the generation of GPS signals with a neat sketch. CO5 8 Marks

| 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 |

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

#### WIRELESS COMMUNICATION AND NETWORKS

[Electronics and Communication Engineering]

| Time: 3 hours Answer One Question from each Unit |     | Max. N                                                                                  | Max. Marks: 70 |          |  |  |
|--------------------------------------------------|-----|-----------------------------------------------------------------------------------------|----------------|----------|--|--|
|                                                  |     | All questions carry equal marks                                                         |                |          |  |  |
|                                                  |     |                                                                                         |                |          |  |  |
| 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  |  |  |
| 5.                                               | 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  |  |  |
|                                                  |     |                                                                                         |                |          |  |  |
| ~                                                | `   |                                                                                         | 001            |          |  |  |
| 5.                                               | a)  | List out the applications of WLAN.                                                      | COI            | 7 Marks  |  |  |
|                                                  | b)  | Compare diffused and directed beam infrared LANs.                                       | CO4            | / Marks  |  |  |
| (                                                | - ) | (OR)                                                                                    | 004            | 7 Maulas |  |  |
| 6.                                               | a)  | List out the requirements of WLAN and explain each.                                     | CO4            | / Marks  |  |  |
|                                                  | D)  | Explain the architecture and services of IEEE 802.11.                                   | COI            | / 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  |  |  |
|                                                  |     |                                                                                         |                |          |  |  |
| 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  |  |  |
|                                                  |     |                                                                                         |                |          |  |  |

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Time: 3 hours

## SREE VIDYANIKETHAN ENGINEERING COLLEGE

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

#### LOW POWER CMOS VLSI DESIGN

[Electronics and Communication Engineering]

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 $Y = A + B + C$<br>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  |
|     |    | \$P \$P \$P                                                                                                                                                           |     |          |

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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                                                             |     |         |
|               |    |                                                                                             |     |         |
| 1             | a) | Describe the behaviour of a resistor over all frequency                                     | CO3 | 7 Marks |
| 1.            | h) | What is loss tangent and explain its significance?                                          | CO3 | 7 Marks |
|               | 0) | OR)                                                                                         | 005 | / Winto |
| 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/<br>(OR)                         | CO3 | 7 Marks |
| 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 |
|               | ,  |                                                                                             |     |         |
| 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 |
|               |    |                                                                                             |     |         |
| 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 |
|               |    | \$P\$ \$P\$ \$P\$                                                                           |     |         |

Time: 3 hours

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

#### SPEECH PROCESSING

[Electronics and Communication Engineering]

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<br>and explain about each block in detail                | CO5 | 7 Marks    |
|-----|----------|--------------------------------------------------------------------------------------------------------------------------------|-----|------------|
|     | b)       | Describe the terms Diphthongs, Unvoiced and Voiced fricatives and<br>artifacts as applied to the production of speech.<br>(OR) | CO1 | 7 Marks    |
| 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.                                                                                 | CO1 | 6 Marks    |
|     |          | i) Short-time average energy and Magnitude.                                                                                    |     |            |
|     |          | 11) Short-time average ZCR.                                                                                                    |     |            |
| 4   | 2)       | (UR)<br>Define short term outcoorrelation. What are its applications?                                                          | CO6 | 9 Martra   |
| 4.  | a)       | Explain how nitch period is estimated using parallel processing approach                                                       | CO0 | 6 Marks    |
|     | 0)       | UNIT-III                                                                                                                       | COJ | U WIAIKS   |
| 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                                                              | CO3 | 7 Marks    |
|     |          | covariance method.                                                                                                             |     |            |
| 0   | a)       | (UR)                                                                                                                           | CO4 | 7 Morka    |
| 0.  | a)       | LPC coefficient extraction                                                                                                     | 004 | / IVIALKS  |
|     | h)       | Explain how vocal tract system is modeled using I P parameters                                                                 | CO3 | 7 Marks    |
|     | 0)       | INTT-V                                                                                                                         | 005 | / 10101113 |
| 0   | a)       | Discuss the features that distinguish the speakers                                                                             | CO4 | 6 Marka    |
| 9.  | a)<br>h) | Explain the concept of evaluating the similarities of speech patterns in                                                       | CO4 | 8 Marks    |
|     | 0)       | speech recognition.                                                                                                            | 004 | 0 IVIAIRS  |
|     |          | (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    |

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#### 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. Discuss Four V's of Big Data. CO1 7 Marks a) Briefly explain Outlier Detection and Treatment. b) CO1 7 Marks (**OR**) Briefly explain Analytics Process model. CO1 7 Marks 2. a) Explain different types of Data Sources and Sampling Techniques. CO1 7 Marks b) UNIT-II 3. What is Hadoop Ecosystem? Discuss various components of Hadoop CO2 7 Marks a) Ecosystem. Describe the basic building blocks of Hadoop in detail. 7 Marks CO2 b) (**OR**) 4. Briefly explain Hadoop File Systems. CO2 7 Marks a) Describe HDFS concepts. b) CO2 7 Marks UNIT-III) 5. Explain anatomy of a Map Reduce. CO3 7 Marks a) Apply the implementation of map reduce concept classic Architecture and CO4 7 Marks b) explain with an example. (**OR**) 6. Explain Shuffle and Sort. CO3 7 Marks a) b) Describe different types of failures in Classic MapReduce. CO3 7 Marks UNIT-IV) What do you mean by HiveQL Data Definition Language? Explain any 7. CO5 7 Marks a) three HIVE QL DDL command with its syntax and example. Compare HIVE with traditional databases. CO4 7 Marks b) (**OR**) Identify the importance of Data Processing Operators of Pig. 8. a) CO<sub>2</sub> 7 Marks Explain Querying Data in HIVE with an Example. CO4 b) 7 Marks UNIT-V ) 9. Investigate about Nutch Search Engine in detail. CO6 7 Marks a) Describe about Crunch and Spark. b) CO6 7 Marks (**OR**) Describe about SEDA. 10. CO1 7 Marks a) Design Hadoop Data flow architecture at Rackspace. CO1 7 Marks b)

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#### 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 |                    |  |  |  |
|---------------|-------------------------------------------|---------------------------------------------------------------------------------------|----------------|--------------------|--|--|--|
|               | <b>Answer One Question from each Unit</b> |                                                                                       |                |                    |  |  |  |
|               |                                           | 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            |  |  |  |
| 2             | a)                                        | ( <b>OR</b> )<br>What are the important human characteristics which have influence on | CO2            | 7 Marks            |  |  |  |
| 2.            | u)                                        | interface and screen design?                                                          | 002            | / WILLING          |  |  |  |
|               | b)                                        | Compare and contrast GUI versus Web page design.                                      | CO2            | 7 Marks            |  |  |  |
|               |                                           |                                                                                       |                |                    |  |  |  |
| 3.            | a)                                        | Explain briefly about the important human characteristics in design of a              | CO3            | 7 Marks            |  |  |  |
|               | 1 \                                       | system.                                                                               | 000            | 7 ) ( 1            |  |  |  |
|               | 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                | CO4            | 7 Marks            |  |  |  |
|               | b)                                        | What is the importance of user's tasks and needs important in design of a             | CO1            | 7 Marks            |  |  |  |
|               | 0)                                        | system?                                                                               | 001            | , 101001110        |  |  |  |
|               |                                           | (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            |  |  |  |
| 6             | <b>a</b> )                                | (OR)<br>What is the role of sereen payingtion and flow in good sereen design?         | $CO^{2}$       | 7 Morka            |  |  |  |
| 0.            | a)<br>b)                                  | What is a Screen? What is the purpose of a screen?                                    | CO2<br>CO2     | 7 Marks<br>7 Marks |  |  |  |
|               | ,                                         |                                                                                       |                |                    |  |  |  |
| 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                     | CO2            | 7 Marks            |  |  |  |
|               | b)                                        | Discuss any 5 possible problems with colour.                                          | CO4            | 7 Marks            |  |  |  |
|               |                                           |                                                                                       |                |                    |  |  |  |
| 0             | a)                                        | What are many selection and dialog how trees? And write it advantages                 | CO1            | 7 Mortes           |  |  |  |
| 9.            | a)<br>b)                                  | What is the role of state charts in specification? Give an example of state-          | CO1            | 7 Marks<br>7 Marks |  |  |  |
|               | -)                                        | chart for file manipulation actions.                                                  |                | ,                  |  |  |  |
|               |                                           | (OR)                                                                                  |                |                    |  |  |  |
| 10.           | a)                                        | Explain the importance of Interface – Building Tools.                                 | CO2            | 7 Marks            |  |  |  |
|               | b)                                        | devices in details.                                                                   | 005            | / Marks            |  |  |  |
|               |                                           |                                                                                       |                |                    |  |  |  |
|               |                                           | $\psi \psi \psi$                                                                      |                |                    |  |  |  |

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#### 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)<br>b) | Describe the working principle of Sodium analyzer with a neat sketch.                                                            | CO1 | 7 Marks<br>7 Marks |
|-----|----------|----------------------------------------------------------------------------------------------------------------------------------|-----|--------------------|
|     | 0)       | (OR)                                                                                                                             | COI |                    |
| 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. (OR)                                                                          | CO2 | 7 Marks            |
| 4.  | a)       | Elucidate the working of any one type of IR spectrometer and mention<br>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            |
|     |          |                                                                                                                                  |     |                    |
| 5.  | a)       | Specify the significance of flame photometer in analysis of chemical                                                             | CO5 | 7 Marks            |
|     |          | solutions and explain the working of clinical flame photometer.                                                                  |     |                    |
|     | 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            |

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

## **BIOMEDICAL SIGNAL PROCESSING**

[Electronics and Instrumentation Engineering]

Max. Marks: 70

Answer One Question from each Unit All questions carry equal marks

## 

- 1. a) With the help of a block diagram, explain the objectives of biomedical CO1 6 Marks signal analysis.
  - b) Explain the following biomedical signals. Draw the waveforms and give CO6 8 Marks the frequency ranges relevant to these signals. (i) ECG (ii) EEG.

#### (OR)

- 2. Sketch the diagram of computer aided diagnosis based upon the CO1 14 Marks biomedical signal analysis.
  - 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:                                                                                                           | CO4 | 14 Marks |
|     |    | i) Detection of Dicrotic notch.                                                                                                  |     |          |
|     |    | 11) Correlation analysis of EEG channels.                                                                                        |     |          |
|     |    | UNIT-V                                                                                                                           |     |          |
| 9.  |    | Explain the Welch method for power spectral. Density determination.                                                              | CO6 | 14 Marks |
|     |    | (OR)                                                                                                                             |     |          |
| 10. |    | Explain the following terms.                                                                                                     | CO6 | 14 Marks |
|     |    | i) Direct FFT. ii) Window functions.                                                                                             |     |          |
|     |    | \$P & \$P                                                                                                                        |     |          |
|     |    | 1                                                                                                                                |     |          |

Time: 3 hours

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#### 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:                                                                                                                                                                                                                                 | CO1 | 9 Marks |
|    |    | i) Photodiode and bidirectional opto isolators.                                                                                                                                                                                                       |     |         |
|    |    | ii) Basic sequence of operation for a PLC.                                                                                                                                                                                                            |     |         |
|    |    | 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 |
|    |    | 1                                                                                                                                                                                                                                                     |     |         |

## UNIT-V

- 9. a) Briefly explain the concept of HART. Explain different HART CO6 6 Marks commands.
  - b) What are the basic requirements of field bus standard? Explain in brief CO5 8 Marks about interoperability and interchangeability.

#### (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 CO4 8 Marks advantages and disadvantages.

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Time: 3 hours

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

## POWER PLANT INSTRUMENTATION

[Electronics and Instrumentation Engineering]

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 |
| 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.<br>(OR)                      | CO2 | 7 Marks |
| 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 |
| 7   | a) | Explain the principle parts of steam turbine                                                       | CO3 | 7 Marks |
| 7.  | 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 |
| 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

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#### 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)<br>b) | Explain about characteristics, advantages and applications of Big data.<br>Explain Apache Hadoop and Hadoop Ecosystem with example.                                                                                                | CO1<br>CO1 | 7 Marks<br>7 Marks |
|-----|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|
| 2.  | a)<br>b) | Explain about the processing of a job in hadoop with a neat sketch.<br>List the various operational modes of hadoop cluster configuration and explain in detail about configuring/installing the hadoop in local/ standalone mode. | CO2<br>CO2 | 7 Marks<br>7 Marks |
|     |          | UNIT-II                                                                                                                                                                                                                            |            |                    |
| 3.  | a)<br>b) | Explain the hadoop distributed file system architecture with a neat sketch.<br>How google file system differs from the hadoop file system and explains<br>the google file system architecture with a neat sketch?                  | CO2<br>CO2 | 7 Marks<br>7 Marks |
| 4.  | a)       | Distinguish between the old and new versions of hadoop API for Map<br>Reduce frame work                                                                                                                                            | CO5        | 7 Marks            |
|     | b)       | Explain about the implementation of map reduce concept with a small example.                                                                                                                                                       | CO5        | 7 Marks            |
|     |          |                                                                                                                                                                                                                                    |            |                    |
| 5.  | a)       | Explain the role of combiner, record reader and partitioner within a map                                                                                                                                                           | CO5        | 7 Marks            |
|     | b)       | Distinguish between the old and new versions of hadoop API for Map<br>Reduce frame work.                                                                                                                                           | CO5        | 7 Marks            |
|     |          | (OR)                                                                                                                                                                                                                               |            |                    |
| 6.  | a)       | Explain the architecture of a pig with a neat sketch.                                                                                                                                                                              | CO5        | 6 Marks            |
|     | D)       | Explain the syntax of a pig program with a suitable example.                                                                                                                                                                       | COS        | 8 Marks            |
|     |          | (UNIT-IV)                                                                                                                                                                                                                          |            |                    |
| 7.  | a)       | Explain about the configuration of CLI client and WI client while<br>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,                                                                                                                                                                | 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           |
| 10. |          | Explain Pig and Wukong to explore Billion-Edge network graphs.<br>$\circledast \ \circledast \ \circledast$                                                                                                                        | CO5        | 14 Marks           |

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

#### **MOBILE APPLICATION DEVELOPMENT**

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

| Time | e: 3 ho | Answer One Question from each Unit                                                                         | Max. | Marks: 70 |
|------|---------|------------------------------------------------------------------------------------------------------------|------|-----------|
|      |         | 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   |
|      |         |                                                                                                            |      |           |

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#### 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 :                                                                            | CO3 | 14 Marks |
|    |     | i) Indexing by Term.                                                                          |     |          |
|    |     | ii) Indexing by Concept.                                                                      |     |          |
|    |     | iii) Multimedia Indexing.                                                                     |     |          |
|    |     | 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<br>Retrieval.         | CO3 | 7 Marks  |
|    |     | (OR)                                                                                          |     |          |
| 6. |     | Discuss the following:                                                                        | CO3 | 14 Marks |
|    |     | i) Term – Term Matrix. ii) Term Relationship Matrix.                                          |     |          |
|    |     | iii) Vector Representation. iv) Iterated Class Assignments.                                   |     |          |
|    |     | 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                                    | CO4 | 5 Marks  |
|    | ,   | Optimization.                                                                                 |     |          |
|    | b)  | Summarize the following Software Search Optimization algorithms.                              | CO5 | 9 Marks  |
|    |     | i) Boyer-Moore algorithm.                                                                     |     |          |
|    |     | ii) Aho-Corasick algorithm.                                                                   |     |          |
|    |     | iii) Knuth morris-pratt algorithm.                                                            |     |          |
|    |     | (OR)                                                                                          |     |          |
| 10 |     | What is Information System Evaluation and give overview on                                    | CO5 | 14 Marks |

10. What is Information System Evaluation and give overview on CO5 14 Marks Evaluation?

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Time: 3 hours

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

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

#### **MOBILE COMPUTING** [Information Technology]

Max. Marks: 70

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

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| 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 | CO2 | 7 Marks |
|     |    | in context-aware computing.                                             |     |         |
|     | 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 |
|     |    |                                                                         |     |         |

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SVEC-16

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

## **CRYPTOGRAPHY AND NETWORK SECURITY**

#### [Information Technology]

Max. Marks: 70

Answer One Question from each Unit All questions carry equal marks

| 1. | a)  | Outline following cryptanalysis attacks.                                                                                       | CO2    | 7 Marks        |
|----|-----|--------------------------------------------------------------------------------------------------------------------------------|--------|----------------|
|    |     | i) Known-plaintext                                                                                                             |        |                |
|    |     | ii) Chosen-plaintext                                                                                                           |        |                |
|    | h)  | Illustrate the components of Conventional Encryption Model with near                                                           | $CO^2$ | 7 Marks        |
|    | 0)  | diagram Explain each component in detail                                                                                       | 002    |                |
|    |     | (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                                                             | CO3    | 7 Marks        |
|    |     | 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 $X_B$ ?                                                         |        |                |
|    | 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                                                     | CO4    | 7 Marks        |
|    | ,   | retrieved at receiver end differentiate digital signature from digital certificate                                             |        | ,              |
|    | b)  | Discuss about the objectives of HMAC and its security features                                                                 | CO1    | 7 Marks        |
|    | 0)  | (OR)                                                                                                                           | 001    | / 1/10/110     |
| 6. | a)  | Write down the steps involved in Elgamal Digital Signature Scheme and                                                          | CO4    | 7 Marks        |
|    | ,   | Schnorr Digital Signature Scheme used for authenticating a person.                                                             |        |                |
|    | 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                                                                | CO5    | 7 Marks        |
|    |     | message generation from sender to receiver and explain with suitable                                                           |        |                |
|    | 1 \ | diagram.                                                                                                                       | ac -   | <b>5</b> ) ( 1 |
|    | b)  | Differentiate between transport modes vs. tunnel mode encryption in IPsec.                                                     | CO5    | / Marks        |

Time: 3 hours

## 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 CO3 7 Marks measures applied.

#### (OR)

- 10. a) Discuss how firewalls help in the establishing a security framework for an CO1 7 Marks organization.
  - b) Explain in detail about the password selection strategies. CO3 7 Marks

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#### 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 What are the steps in simulation study? Explain. CO1 8 Marks 1. a) List out the advantages and disadvantages of Simulation. CO1 6 Marks b) (OR)2. Name the entities, attributes, activities, events and state variables for the CO1 8 Marks a) system shown below: i) Library. ii) Bank. iii) Airport. iv) Grocery store. Define simulation. List any five circumstances, when the simulation is CO1 6 Marks b) the appropriate tool and when it is not. UNIT-II ) 3. Write R code to find the factorial of a number (use recursion). CO3 7 Marks a) Write R code for calculating the coefficient of correlation using the CO3 b) 7 Marks following data. 24 24 10 12 18 27 13 18 12 25 30 10 (**OR**) 4. How to pass default values for arguments in R? Give example. CO3 7 Marks a) Discuss about ANOVA. CO3 7 Marks b) UNIT-III) Explain any two discrete distributions. CO1 7 Marks 5. a) What is Poisson process? Mention the properties of Poisson process. CO<sub>2</sub> 7 Marks b) (**OR**) 6. Six dump trucks are used to haul coal from entrance of a small mine to CO4 14 Marks 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: Loading Time 5 5 15 10 10 10 10 Weighing Time 12 12 12 16 12 16 Traveling time 60 100 40 40 80 UNIT-IV 7. Explain any two long-run measures of performance of queuing systems. CO2 7 Marks a) Explain about Networks of queues. CO2 7 Marks b) (**OR**) Explain inverse-transform technique of producing random variates for CO3 8. 3 Marks a) exponential distribution. Generate three Poison variates with mean  $\alpha = 0.2$ . b) CO3 4 Marks

Explain the types of simulation with respect to output analysis with CO3 7 Marks c) example.

- 9. a) Differentiate between terminating or transient simulation and steady state CO6 7 Marks simulation with examples.
  - 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 CO6 14 Marks data and time varying data.

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#### 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 Compare Traditional Engineering and System Engineering disciplines. 1. CO1 7 Marks a) Briefly explain various system engineering activities and products. CO1 7 Marks b) (**OR**) 2. Explain what Modularity is with an example and give its characteristics. CO1 7 Marks a) b) Briefly explain about origins of systems engineering. CO1 7 Marks UNIT-II 3. Discuss about the Model of Complex System. CO<sub>2</sub> 14 Marks (**OR**) 4. Explain System Life Cycle. CO2 14 Marks UNIT-III) 5. Explain the process of producing needs and requirement analysis in CO3 7 Marks a) system engineering. What are system functional specifications? CO3 b) 7 Marks (OR)6. What are the advantages of using the system design team approach for a 7 Marks CO3 a) large development project? What do we need operational requirements analysis. CO3 7 Marks **b**) UNIT-IV 7. List the characteristics of a set of well stated operational requirements for CO4 5 Marks a) analyzing their adequacy. Explain functional analysis and formulation. CO<sub>4</sub> 9 Marks b) (OR)8. Define the primary systems engineering activities that contribute to CO4 7 Marks a) products of the needs analysis phase. Explain about concept validation. b) CO4 7 Marks UNIT-V 9. Discuss with examples of different activities in the advanced development CO5 14 Marks phase. (OR)10. Explain the steps for transition from development to production. CO5 7 Marks a) b) Discuss In- Service support. CO5 7 Marks

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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 | CO3 | 7 Marks        |  |  |
|               | , i | client socket?                                                        |     |                |  |  |
|               | 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 recyfrom 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        |  |  |
|               |     |                                                                       |     |                |  |  |
| 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        |  |  |
|               |     |                                                                       |     |                |  |  |

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

#### **INTERNET OF THINGS**

#### [Computer Science and Engineering, Computer Science and Systems Engineering]

| Max. Marks: 70                       |  |
|--------------------------------------|--|
|                                      |  |
|                                      |  |
| 4 Marks                              |  |
| 4 Marks                              |  |
|                                      |  |
| 6 Marks                              |  |
| 3 Marks                              |  |
|                                      |  |
| 4 Marks                              |  |
|                                      |  |
| 3 Marks                              |  |
| 5 Marks                              |  |
|                                      |  |
| 4 Marks                              |  |
|                                      |  |
| 7 Marks                              |  |
| <sup>7</sup> Marks                   |  |
|                                      |  |
| 4 Marks                              |  |
|                                      |  |
| 4 Marks                              |  |
|                                      |  |
| ′ Marks<br>7 Marks                   |  |
| 4<br>3<br>5<br>7<br>7<br>4<br>4<br>4 |  |

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Time: 3 hours

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#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

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

#### MANAGEMENT SCIENCE [Information Technology]

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 CO1 14 Marks with examples.

#### (**O**R)

- 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 CO3 8 Marks
  - that?

## UNIT-II

3. a) Explain the basic steps of Method study.
b) Explain briefly the basic principles involved in preparing the layout of CO2 7 Marks any industrial plant indicating the important techniques available for the purpose.

#### (**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 CO1 7 Marks them.

#### (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 CO1 8 Marks performance appraisal.

#### (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 CO4 14 Marks listed in the table below.

| Activity | Dradaaassar | Estimated duration(Weeks) |             |             |  |  |
|----------|-------------|---------------------------|-------------|-------------|--|--|
| Activity | Fledecessol | Optimistic                | Most likely | Pessimistic |  |  |
| А        | -           | 1                         | 1           | 7           |  |  |
| В        |             | 1                         | 4           | 7           |  |  |
| С        |             | 2                         | 2           | 8           |  |  |
| D        | А           | 1                         | 1           | 1           |  |  |
| Е        | В           | 2                         | 5           | 14          |  |  |
| F        | С           | 2                         | 5           | 8           |  |  |
| G        | D,E         | 3                         | 6           | 15          |  |  |
| Н        | 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**)

1

| 8.  | a) | Explain the term 'Entrepreneur'. State the characteristics of an    | CO5 | 6 Marks |
|-----|----|---------------------------------------------------------------------|-----|---------|
|     |    | entrepreneur.                                                       |     |         |
|     | 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 |
|     |    |                                                                     |     |         |

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#### 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

SVEC-16

#### 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.<br>(OR)                                                        | CO3 | 14 Marks |
| 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  |
|     |    |                                                                                                                         |     |          |
| 9.  |    | Your short and medium range goals will include efforts to secure raises<br>and promotions Illustrate                    | CO3 | 14 Marks |
|     |    | (OR)                                                                                                                    |     |          |
| 10. | a) | Up gradation of skills for the requirement of a job is compulsory".<br>Evaluate                                         | CO5 | 7 Marks  |
|     | b) | "A performance Appraisal is an official evaluation of your work" Justify.                                               | CO5 | 7 Marks  |

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

## **REFRIGERATION AND AIR CONDITIONING**

[Mechanical Engineering]

Max. Marks: 70

Time: 3 hours

#### 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<br>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°C and refrigerator temperature is -5°C. (OR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | CO3        | 8 Marks             |
| 2. | a)<br>b) | Derive an expression for the COP of Bell- Coleman cycle.<br>The capacity of a refrigerator is 200 TR when working between - 8°C and 26°C. Determine the mass of ice produced per day from water at 26°C.<br>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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | CO1<br>CO2 | 6 Marks<br>8 Marks  |
| 3. | a)       | How does the increase in condenser temperature affect COP? Also<br>explain the influence of evaporator temperature on COP. Which of the<br>two temperatures have more influence on COP?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | CO1        | 6 Marks             |
|    | b)       | A vapour compression machine is used to maintain a temperature of<br>-23°C in a refrigerated space. The ambient temperature is 37°C. The<br>compressor takes in dry saturated vapour of F-12. A minimum 10°C<br>temperature difference is required at the evaporator as well as at<br>condenser. There is no sub cooling of the liquid If the refrigerant flow<br>rate is 1 kg/min, Find:<br>i) Tonnage of refrigeration.<br>ii) Power requirement.<br>iii) Ratio of COP of this cycle to COP of Carnot cycle.<br>(OR)                                                                                                                                                                                                                                                                                                                                | CO4        | 8 Marks             |
| 4. | a)<br>b) | What are essential properties of a good refrigerant?<br>A four cylinder, single acting R-12 compressor 30 cm x 40 cm runs at<br>960 r.p.m. The compressor clearance factor is 0.03 and the law of<br>compression $PV^{1,1} = C$ . The operating pressures for the vapour<br>compression refrigeration system are: 8.47 bar (35°C) and 1.004 bar<br>(-30°). The refrigerant temperatures are: entering the compressor -20°C,<br>leaving the compressor 50°C; entering the condenser 45°C, leaving the<br>condenser 25°C, entering the expansion valve 30° and leaving the<br>evaporator dry saturated. Assuming that heat removed in the compressor<br>is 25 kJ/sec. calculate:<br>i) The refrigerating capacity.<br>ii) The compressor power.<br>iii) COP.<br>iv) Mass of condensing cooling water assuming the rise<br>in term evaporator to be 10°C | CO1<br>CO4 | 4 Marks<br>10 Marks |
|    |          | in temperature to be 10°C.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |                     |

v) Also tabulate energy balance for 1 kg of refrigerant.

## UNIT-III)

5. Discuss the advantages of vapour absorption refrigeration system over CO1 7 Marks a) vapour compression refrigeration system. In a vapour absorption refrigeration system, heating, cooling and CO3 7 Marks b) refrigeration takes place at the temperatures of 100°C, 20°C and -5°C respectively. Find the maximum C.O.P of the system. (OR)What is thermo electric refrigeration system? List out the merits and 6. CO2 7 Marks a) demerits of thermo-electric refrigeration system over other refrigeration system. What are the fields of its applications? Determine the COP of a vapour absorption refrigeration system when the b) CO2 7 Marks temperature of generator is 120°C, the temperature of the condenser is 30°C and the temperature of the evaporator is -20°C. What would be its COP if it were a Carnot. UNIT-IV) 7. The following data apply to an air conditioning system: CO5 14 Marks Room sensible heat =41868kJ/hr; room latent heat=41868 kJ/hr; inside design condition= 25°, 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 10°C 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. (OR) 8. Explain in brief, an adiabatic saturation process. Represent the same on a CO1 6 Marks a) psychrometric chart. Ten grams of moisture per kg of dry air is removed from atmospheric air CO6 8 Marks b) when it is passed through an air conditioning system and its temperature becomes 20°C. The atmospheric conditions are 40°C 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. UNIT-V 9. Discuss the filters used in air conditioning systems. CO1 7 Marks a) Explain the use of heat pump for heating and cooling cycle with a neat CO1 b) 7 Marks diagram. (OR)10. Define human comfort and explain the factors which affect human a) CO1 7 Marks comfort. Discuss various types of duct systems and their applications. CO1 7 Marks b) රුවු ද්ම କ୍ରେ

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

## COMPUTER NETWORKS

#### [Electronics and Instrumentation Engineering]

Time: 3 hours

Max. Marks: 70

SVEC-16

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

| 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<br>from errors using the CRC polynomial $x^4 + x^2 + 1$ . Use polynomial long<br>division to determine the message that should be transmitted. Suppose the<br>leftmost bit of the message is inverted due to noise on the transmission<br>link. What is the result of the 'receiver's CRC calculation? How does the<br>receiver know that an error has occurred? | CO4 | 7 Marks |
|    | b) | Explain the algorithm used for reliable transmission and flow control. <b>(OR)</b>                                                                                                                                                                                                                                                                                                                                                      | CO1 | 7 Marks |
| 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.                                                                                                                                                                                                                                                                                                                                                                                             | COI | 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 |
| 0  |    | (OR)                                                                                                                                                                                                                                                                                                                                                                                                                                    | 004 |         |
| 8. | a) | A client uses UDP to send data to server. The data length is 16 bytes.<br>Calculate the efficiency of this transmission at the UDP level (ration of<br>useful bytes to total bytes).                                                                                                                                                                                                                                                    | CO4 | 6 Marks |
|    | b) | <ul><li>Briefly explain the following Timers in TCP.</li><li>i) Retransmission Time Out.</li><li>ii) Persistence Timer</li></ul>                                                                                                                                                                                                                                                                                                        | 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 |
|     |    |                                                                  |     |         |

\$} \$} \$} Time: 3 hours

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Roll No.

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

#### WEB TECHNOLOGIES

[Computer Science and Engineering]

Answer One Question from each Unit All questions carry equal marks Max. Marks: 70

#### 

| 1.  | a) | Name different types of lists sup<br>HTML and HTML5. | pported by HTML. Distinguish between      | CO1<br>CO2 | 7 Marks  |
|-----|----|------------------------------------------------------|-------------------------------------------|------------|----------|
|     | b) | Explain the following HTML tag                       | s with suitable example.                  | CO1        | 7 Marks  |
|     | ,  | i) <pre>ii) &lt;</pre>                               | <canvas></canvas>                         |            |          |
|     |    | iii) <img/> iv)                                      | <div></div>                               |            |          |
|     |    | , <u> </u>                                           | (OR)                                      |            |          |
| 2.  | a) | Explain various form elements of                     | THTML with suitable example.              | CO1        | 7 Marks  |
|     | b) | Explain the following HTML tag                       | s with suitable example.                  | CO1        | 7 Marks  |
|     |    | i) <font> ii)</font>                                 | <meta/>                                   |            |          |
|     |    | iii) iv)                                             | <video></video>                           |            |          |
|     |    |                                                      | UNIT-II                                   |            |          |
| 3.  | a) | Classify CSS selectors and explai                    | n.                                        | CO2        | 7 Marks  |
|     | b) | Design a web page that display                       | credit card type and then validate the    | CO6        | 7 Marks  |
|     |    | entered card number according to                     | the card type.                            |            |          |
|     |    | -                                                    | (OR)                                      |            |          |
| 4.  | a) | Explain the following pre-defined                    | l objects of JavaScript.                  | CO1        | 7 Marks  |
|     |    | i) Window. ii) I                                     | Document.                                 |            |          |
|     | b) | Develop a web page to convert 1                      | Indian rupees to Foreign currency. Read   | CO6        | 7 Marks  |
|     |    | the Indian rupees through input                      | t dialog and select foreign currency to   |            |          |
|     |    | which Indian rupees are converted                    | d using drop down menu.                   |            |          |
|     |    |                                                      | (UNIT-III)                                |            |          |
| 5.  |    | Develop a mobile optimized w                         | ebsite for displaying the images using    | CO5        | 14 Marks |
|     |    | responsive classes.                                  |                                           |            |          |
|     |    |                                                      | (OR)                                      |            |          |
| 6.  |    | Develop Contact Us Web Page us                       | sing 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     | CO4        | 8 Marks  |
|     |    | form and then display user name                      | ne in green color and sets user favorite  |            |          |
|     |    | color as a background color to the                   | e web page.                               |            |          |
|     | b) | Demonstrate the implementation                       | of Object Cloning in PHP.                 | CO1        | 6 Marks  |
|     |    |                                                      | (OR)                                      |            |          |
| 8.  | a) | Develop a PHP code to implement                      | nt constructor.                           | CO3        | 8 Marks  |
|     | b) | Demonstrate OOP principles with                      | n suitable example using PHP.             | CO1        | 6 Marks  |
|     |    |                                                      | UNIT-V                                    |            |          |
| 9.  | a) | Define a prepared statement. Exp                     | lain in detail with the suitable program. | CO3        | 7 Marks  |
|     | b) | Create a web page to perform for                     | m data validation in PHP.                 | CO4        | 7 Marks  |
|     |    |                                                      | (OR)                                      |            |          |
| 10. | a) | List the different authentication n                  | nethodologies used in PHP.                | CO1        | 7 Marks  |
|     | b) | Design a web page to store the co                    | ontact us form data in the database using | CO3        | 7 Marks  |
|     |    | PHP. (Note: contact us page con                      | tains the following fields Name, Email,   |            |          |
|     |    | subject, message and submit butto                    | on).                                      |            |          |

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Time: 3 hours

Roll No.

#### **SREE VIDYANIKETHAN ENGINEERING COLLEGE**

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### COMPILER DESIGN [Computer Science and Engineering]

Max. Marks: 70

SVEC-16

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                                                   | CO3 | 14 Marks |
|    |    | $S \rightarrow L=R  R $                                                                            |     |          |
|    |    | $L \rightarrow R \mid id$                                                                          |     |          |
|    |    | $R \rightarrow L$                                                                                  |     |          |
|    |    | Justify whether the grammar is $LR(0)$ or not.                                                     |     |          |
|    |    | (OR)                                                                                               |     |          |
| 4. | a) | Define Ambiguous grammar. Eliminate ambiguity for the grammar $E \rightarrow E + E/E - E/(E)/id$ . | 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                             | CO4 | 8 Marks  |
|    |    | L→En                                                                                               |     |          |
|    |    | $E \rightarrow E + T$                                                                              |     |          |
|    |    | $E \rightarrow T$                                                                                  |     |          |
|    |    | $T \rightarrow T^*F$                                                                               |     |          |
|    |    | $T \rightarrow F$                                                                                  |     |          |
|    |    | $F \rightarrow (E)$                                                                                |     |          |
|    |    | $F \rightarrow digit.$                                                                             |     |          |
|    | b) | Write Type Expression for the type an array of pointers to real, where the                         | CO1 | 6 Marks  |
|    |    | array index ranges from 1 to 100.                                                                  |     |          |
|    |    | 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 CO4 7 Marks address code  $b^* - (a + b)$ .

#### (OR)

| 8.  | a)     | Explain the usage of search tree in implementing symbol table.                                                   |     | 7 Marks |  |
|-----|--------|------------------------------------------------------------------------------------------------------------------|-----|---------|--|
|     | b)     | b) Differentiate between formal parameters and actual parameters. Explain about activation of procedure/function |     | 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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Max. Marks: 70

#### **SREE VIDYANIKETHAN ENGINEERING COLLEGE**

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

#### **RURAL TECHNOLOGY**

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

Time: 3 hours

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

## 

| 1. | a)<br>b) | Discuss briefly about impacts occurred while transferring the technology.<br>Explain the role of technology in poverty eradication in rural development.                                                                                   | CO1<br>CO1 | 7 Marks<br>7 Marks |
|----|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|
|    |          | (OR)                                                                                                                                                                                                                                       |            |                    |
| 2. | a)       | Thandrapadu is one of the backward village in Kurnool District with lack<br>of infrastructure facilities. Choose the technologies that can improve the<br>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<br>and carried out his research in renewable energy sources. He wants to<br>implement his ideas in rural areas. How can he help rural areas in using<br>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<br>Ramapuram which is near to the forest area. Show how the waste can be<br>used by the rural people with the technology for cooking?                                   | CO4        | 7 Marks            |
|    | b)       | Explain briefly about procedure involved in concentration solar power<br>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                                                                                   | CO6        | 7 Marks            |

importance and uses of bio fertilizers.b) Pandurangapuram which is one of the villages in the drought prone area CO4 7 Marks of the Rayalaseema area. Show how rain water technology is useful for the village.

#### (OR)

1
- 8. a) Write the importance of medical and aromatic plants and explain their CO5 7 Marks need in community development.
  - b) Give solution how dry land can be converted to farming land keeping in CO2 7 Marks view of bio-fertilizers.

- 9. a) What is meant by CSR? How development can be achieved with the CO3 7 Marks involvement of private sector participation in the rural area?
  - 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 CO2 14 Marks India?

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#### 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 Define early testing. List the benefits of early testing. 1. CO1 7 Marks a) b) What is the psychology behind testing by an independent team? CO1 7 Marks (**OR**) 2. Compare manual testing and automated testing. CO2 8 Marks a) b) Define test strategy matrix. Explain. CO1 6 Marks UNIT-II 3. What is loop testing? Explain various loops. CO1 8 Marks a) Explain data flow testing in detail. CO1 b) 6 Marks (**OR**) Differentiate statement coverage and condition coverage. 4. CO<sub>2</sub> 8 Marks a) b) Explain multiple condition coverage. CO1 6 Marks (UNIT-III) List the steps involved in deriving test cases using cause effect graphing 5. a) CO<sub>2</sub> 7 Marks based testing. Derive the test cases for the following scenario. CO3 7 Marks b) "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]." (OR)Design a finite state machine which accepts "aabb" character sequence in 6. CO3 7 Marks a) a given text. Write an algorithm that simulates the behavior of finite state machine. b) CO1 7 Marks UNIT-IV) 7. Test the Auto Teller Machine software by developing the following. CO6 14 Marks i) Unit test plan. ii) Integration test plan. iii) System test plan. (**OR**) CO4 8. Consider a project with the following components: 14 Marks 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. UNIT-V 9. Explain the need for automated testing tools. a) CO1 7 Marks Analyze the steps involved in selecting software testing tools. b) CO<sub>2</sub> 7 Marks (**OR**) 10. Evaluate the role software size metrics on software quality. 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

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 Explain Software Testing Model with neat diagram. CO1 8 Marks 1. a) b) Explain Software testing as process. Justify? CO1 6 Marks (**OR**) Define STLC and explain each step in detail. 8 Marks 2. CO1 a) Compare Positive and Negative testing. CO<sub>2</sub> 6 Marks b) UNIT-II Distinguish between decision node and junction node. 3. CO<sub>2</sub> 7 Marks a) Design Test cases for Statement coverage and Branch coverage. Explain CO3 7 Marks b) with an appropriate example. (**OR**) 4. Explain data flow testing in detail. CO1 6 Marks a) Write a program to display the prime numbers up to a given number. b) CO4 8 Marks Draw the control flow graph and calculate the cyclomatic complexity number for the given program. (UNIT-III) 5. List and explain the elements of state testing. CO1 7 Marks a) Identify the possible states, inputs of a software process and draw its CO2 b) 7 Marks corresponding state table. (**OR**) Describe the need of state table. Explain the process of converting state 7 Marks 6. CO3 a) table into test cases. "Error Guessing is an ad hoc approach for testing." Comment on this CO1 7 Marks b) statement UNIT-IV) 7. Discuss the key components of test management. CO1 7 Marks a) Analyze the role testing group activities for conducting software testing CO2 7 Marks b) effectively. (**OR**) List the differences between size oriented metrics and function point 8. CO<sub>2</sub> 7 Marks a) analysis metrics. Explain the process of calculating function points of real time software. CO4 7 Marks b) UNIT-V 9. Identify the different parameters required for evaluating regression test CO2 7 Marks a) selection techniques. T contains 90 tests of which 20 are modification-revealing for P and P' CO4 7 Marks b) and M selects 12 of these 20 tests, then calculate the inclusiveness of M relative to P, P' and T. (**OR**) Apply the regression testing techniques on measuring software quality. 10. 7 Marks CO<sub>5</sub> a) Use web application testing tool to insert standard checkpoints for flight CO6 7 Marks b) application.

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

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

#### **CLOUD COMPUTING**

### [Computer Science and Engineering]

Max. Marks: 70

SVEC-16

Time: 3 hours

#### 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                   | CO2             | 7 Marks   |
|     |    | explain in-detail.                                                                   | CO5             |           |
|     |    | (OR)                                                                                 |                 |           |
| 6.  |    | Evaluate various components in Cloud Architecture.                                   | CO4             | 14 Marks  |
|     |    | i) Workload Distribution.                                                            |                 |           |
|     |    | 11) Resource Pooling.                                                                |                 |           |
|     |    | 111) Dynamic Scalability.                                                            |                 |           |
|     |    | iv) Elastic Resource Capacity.                                                       |                 |           |
|     |    | UNIT-IV                                                                              |                 |           |
| 7.  | a) | Distinguish between IaaS and PaaS with services and features.                        | CO2             | 7 Marks   |
|     | b) | Analyze various Disasters in Cloud Computing. Explain.                               | CO2             | 7 Marks   |
|     |    | 1) Cloud Scale I. 11) Disasters in the Cloud.                                        |                 |           |
| 0   |    | (OR)                                                                                 | <b>a a</b>      | 1 4 3 6 1 |
| 8.  |    | Discuss various security issues of Cloud security.                                   | CO <sub>2</sub> | 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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(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]

Max. Marks: 70

SVEC-16

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 CO1 14 Marks cost estimate process with example.

#### (OR)

2. What are the ways of achieving better economics in software? Explain CO1 14 Marks with some examples.

### UNIT-II)

3. How do you evaluate the completion of each of the four phases in CO1 14 Marks software life cycle?

#### (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 CO3 14 Marks of them.

### (OR)

- 6. Illustrate the Model based Architecture with example. CO2 14 Marks
- 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 CO6 14 Marks in project control.

#### (**OR**)

10. What are roles of Project manager in the Agile management and benefits CO3 14 Marks of Agile management?

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(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

#### **ESTIMATION AND QUANTITY SURVEYING**

#### [Civil Engineering]

Max. Marks: 70

SVEC-16

Time: 3 hours

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 CO4 14 Marks building from the given plan and cross section as shown in Fig.1, by using long wall and short wall method.
  - 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.



(OR)

- 2. Estimate the quantities of the building items of a hexagonal room from CO4 14 Marks the given plan and section as shown in Fig.2, by using center line method.
  - 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.





# UNIT-II

- a) Estimate the quantity of sanitary line using NP<sub>2</sub> RCC Hume pipe line for CO2 7 Marks 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.
  - b) Estimate the quantities of the retaining wall shown in figure below. CO2 7 Marks



#### (OR)

- 4. a) What are the different methods for computation of earth work excavation CO1 6 Marks in road embankments?
  - b) Prepare a detailed estimate for construction of a new state highway for CO2 8 Marks 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.

### 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. CO3 7 Marks a) Describe the legal requirements of a contract. What is negotiated contract? Describe briefly labour contract. CO1 7 Marks b) (**OR**) 8. 7 Marks CO1 a) Define arbitration. What are the requirements of arbitration? CO1 7 Marks b) Discuss the types of termination of contract.

| 9.  | a) | List the different methods of depreciation.                                                                                                                                                                                                                                                     |                       | CO1 | 6 Marks |  |  |
|-----|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----|---------|--|--|
|     | b) | Calculate the annual rent of a building with                                                                                                                                                                                                                                                    | n the following data. | CO2 | 8 Marks |  |  |
|     |    | Cost of land = $Rs.20,000/-$                                                                                                                                                                                                                                                                    |                       |     |         |  |  |
|     |    | Cost of building = Rs.80,000/-                                                                                                                                                                                                                                                                  |                       |     |         |  |  |
|     |    | Estimate life = 80years                                                                                                                                                                                                                                                                         |                       |     |         |  |  |
|     |    | Return expected = $5\%$ on land $6\%$ on build                                                                                                                                                                                                                                                  | ling                  |     |         |  |  |
|     |    | Annual repairs are expected to be 0.7% of the cost construction and other out goings will be 25% of the gross rent.                                                                                                                                                                             |                       |     |         |  |  |
|     |    | (0)                                                                                                                                                                                                                                                                                             | R)                    |     |         |  |  |
| 10. | a) | State the following terms :                                                                                                                                                                                                                                                                     |                       | CO1 | 6 Marks |  |  |
|     |    | i) Scrap valve. ii) S                                                                                                                                                                                                                                                                           | alvage valve.         |     |         |  |  |
|     |    | iii) Book valve. iv) N                                                                                                                                                                                                                                                                          | larket valve.         |     |         |  |  |
|     | b) | An old building has been purchased by a person at a cost of Rs.30,000/-<br>excluding the cost of the land. Evaluate the amount of annual sinking<br>fund at 4% interest assuming the future life of the building as 20 years<br>and scarp value of the building as 10% of the cost of purchase. |                       |     | 8 Marks |  |  |

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

# **GEOSPATIAL TECHNOLOGY**

[Civil Engineering]

Max. Marks: 70

SVEC-16

Answer One Question from each Unit All questions carry equal marks

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|---|----|----|-----|--|
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| 1.  | a) | Define:                                                                                                   | CO1 | 6 Marks  |
|-----|----|-----------------------------------------------------------------------------------------------------------|-----|----------|
|     |    | i) tilt. ii) focal length. iii) isocentre.                                                                |     |          |
|     | 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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#### IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

#### **RAILWAY, AIRPORT AND HARBOUR ENGINEERING**

#### [Civil Engineering]

Max. Marks: 70

#### **Answer One Question from each Unit** All questions carry equal marks

### UNIT-I

1. What is a sleeper? List the functions, types of sleepers and compare one CO1 7 Marks a) another. What are the requirements of an ideal rail joint? Also explain the various CO1 7 Marks b) rail joints used in railways with neat sketches. (**OR**) 2. Compare the widening of gauges on curves with formula and coning of CO2 a) 7 Marks wheels with neat sketches. If the wheel base of a vehicle moving on a B.G track is 6m, the diameter 7 Marks b) CO6 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. UNIT-II ) 3. Describe in detail about plate laying techniques. CO5 7 Marks a) Discuss in detail about the modern methods of maintenance of railway CO4 7 Marks b) tracks. (**OR**) Summarize how poor soil is being stabilized and explain the methods in CO1 4. 7 Marks a) detail Discuss the materials required for track laying and list the factors b) CO1 7 Marks considered in the construction of railway track. (UNIT-III) List the factors to be considered for the selection of site for a commercial CO1 5. 7 Marks a) airport. What are the basic patterns of runway configurations? Discuss each CO1 7 Marks b) pattern. (**OR**) Explain the importance of airport planning. 6. CO1 7 Marks a) b) What are the characteristics of a good airport layout? CO1 7 Marks UNIT-IV) What are the items to be considered in the geometric design of runway 7. CO3 7 Marks a) and explain it in detail? Write the construction procedure of the windrose diagram. b) CO5 7 Marks (**OR**) Write in detail the various design elements to be considered in taxiway CO8 8. 7 Marks a) laying as per IS standards. The length of a runway at mean sea level, standard temperature and zero CO3 7 Marks b) gradients is 1600m. The site has an elevation of 320m, with a reference temperature of 33.6°C. The runway has to be constructed with an effective gradient of 0.25%. Calculate the actual length of the runway at site.

- 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 CO1 7 Marks construction of a port.

#### (OR)

- 10. a) Discuss in detail about the environmental concern required for port CO7 7 Marks operation.
  - b) What are the components of a harbour? Draw neat sketches of the layout CO1 7 Marks of an artificial harbour and road stead.

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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]

Max. Marks: 70

SVEC-16

#### 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 CO1 6 Marks meter and Dilatometer.
  - b) Calculate the net allowable bearing pressure and ultimate load of CO2 8 Marks 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<sup>3</sup>. Natural water table is at a depth of 2 m below ground level. The unit cohesion of soil is 30 kN/m<sup>2</sup> and soil friction angle is 27°.

#### OR)

- 2. a) Where do you provide a combined footing? Discuss the procedure for the CO1 6 Marks design of rectangular combined footing.
  - b) The figure shows a shallow foundation in clay. The following data are CO6 8 Marks given: B=1.2 m; D<sub>f</sub>=1.2 m; b=0.8 m; H=6.3 m; slope angle=30<sup>o</sup>, unit weight of soil=17.5 kN/m<sup>3</sup>,  $\varphi$ =0 and c=50 kN/m<sup>2</sup>. Determine the gross allowable bearing capacity with a factor of safety 4. N<sub>c</sub>=6.3.



- 3. a) Describe briefly Reese and Matlocks theory of analysis and design of CO1 6 Marks laterally loaded piles.
  - b) A concrete pile of 13 m length and 405 mm x 405 mm in cross section is CO6 8 Marks embedded in saturated clay ( $c_u=85 \text{ kN/m}^2$ ,  $\gamma = 18 \text{ kN/m}^3$ ). Determine the allowable load that the pile can carry (F.S = 4). Use the  $\alpha$  method for determining the skin resistance ( $\alpha = 0.6$ ).

#### (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 CO2 8 Marks
  - b) A friction pile group is carrying a load of 3000 kN including the weight of CO2 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<sup>3</sup>, initial void ratio = 1.0. Compute the settlement of the group.

Time: 3 hours

# UNIT-III

- 5. Write about the cantilever sheet piling in granular soils. a)
  - A cantilever sheet pile is to be constructed to retain sandy soil to a depth of CO3 8 Marks b) 6 m. The dry unit weight of sand is 16 kN/m<sup>3</sup> and the saturated unit weight is 20 kN/m<sup>3</sup>. The angle of shearing resistance of sand is 32<sup>o</sup>. The water level is 3 m above the dredge line. Design the depth of embedment of the sheet pile.

### (**OR**)

- 6. Sketch a typical section of a braced cut and show the various components. **CO8** a) CO3
  - Design an anchored bulkhead for its depth and determine the force in the b) 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  $\phi$ =30°. Use the free earth support method.



- 7. How to classify an expansive soil based on its liquid limit, plasticity index, a) CO1 7 Marks shrinkage limit and percentage of clay fraction?
  - How lime column technique minimizes the swelling and shrinkage CO5 7 Marks b) characteristics of expansive soils?

#### (**OR**)

- 8. Describe the method of replacement of the expansive soil with a good CO4 7 Marks a) quality soil. How would you solve the problem of constructing a footing using this method?
  - Determine the capacity of 5.0m long single under-reamed pile of stem CO<sub>2</sub> 7 Marks b) diameter 40 cm. The stratum is a deep deposit of medium dense sand having  $\gamma = 18$  kN/m<sup>3</sup> and  $\phi = 30^{\circ}$ .

# UNIT-V

| 9. | a) | What are the different types of marine structures? Explain types and choice | CO1 | 6 Marks |
|----|----|-----------------------------------------------------------------------------|-----|---------|
|    |    | of breakwaters in brief.                                                    |     |         |
|    | b) | Write a brief note on the design of Rubble Mound Breakwaters as per IS      | CO7 | 8 Marks |
|    |    | code.                                                                       |     |         |

#### (**OR**)

14 Marks

CO1

6 Marks

6 Marks

8 Marks

10. Write short notes on the following: CO1 i) Breakwaters. ii) Wharves. iv) Ship Impact. iii) Jetties.

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SVEC-16

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

Roll No.

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

#### BRIDGE ENGINEERING [Civil Engineering]

Max. Marks: 70

Time: 3 hours

### 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   |
|    | 0) | (OR)                                                                                                                                                                                                                                                                                       | COI | 0 WILLING |
| 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 $= 7.8 \text{m}$                                                                                                                                                                                                                                                   |     |           |
|    |    | 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<br>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 | CO5 | 14 Marks  |
|    |    | this two lane bridge as per the IRC specifications, moderate exposure and                                                                                                                                                                                                                  |     |           |

cement concrete wearing coat.

| 7.  | a) | Explain the forces acting on bridge bearings.                                                                 | CO2 | 5 Marks  |
|-----|----|---------------------------------------------------------------------------------------------------------------|-----|----------|
|     | b) | Design a steel rocker bearing for transmitting a vertical reaction of                                         | CO3 | 9 Marks  |
|     |    | 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 $block = 5 \text{ N/mm}^2$                                     |     |          |
|     |    | Permissible bending stress in steel plate = $165 \text{ N/mm}^2$                                              |     |          |
|     |    | Permissible bearing stress in steel plate = $190 \text{ N/mm}^2$                                              |     |          |
|     |    | Permissible shear stress in steel = $110 \text{ N/mm}^2$                                                      |     |          |
|     |    | Sketch the typical details of the rocker bearing.                                                             |     |          |
|     |    | (OR)                                                                                                          |     |          |
| 8.  |    | Design an elastomeric pad bearing to support a tee beam girder of a major<br>bridge using the fallowing data: | CO3 | 14 Marks |
|     |    | Maximum dead load reaction/bearing $= 340 \text{ kN}$                                                         |     |          |
|     |    | Maximum load reaction/ bearing $= 550 \text{ kN}$                                                             |     |          |
|     |    | Longitudinal force due to friction for each bearing $= 35 \text{ kN}$                                         |     |          |
|     |    | Effective span of the girder $= 23 \text{ m}$                                                                 |     |          |
|     |    | 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 = $5 \times 10^{-4}$ units.                                           |     |          |
|     |    | Draw the details of the bearing.                                                                              |     |          |
|     |    | 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:                                                                                          | CO1 | 14 Marks |
|     |    | 1) Bed block.                                                                                                 |     |          |
|     |    | 1) Wing walls and approach slab.                                                                              |     |          |
|     |    | 111) Bridge foundations.                                                                                      |     |          |
|     |    |                                                                                                               |     |          |

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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

### **GROUND IMPROVEMENT TECHNIQUES**

#### [Civil Engineering]

Max. Marks: 70

SVEC-16

#### 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?                                                 |     | 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    |
| 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    |
| 5  | a) | What is the principle of soil densification? List out the factors that affect                                                                        | CO1 | 7 Marks    |
| 5. | u) | compaction and discuss in brief.                                                                                                                     | 001 | / 10101113 |
|    | b) | List out the various in–situ densification methods in granular soils.<br>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                                                                          | CO1 | 7 Marks    |
| /. | u) | with respect to the soil type.                                                                                                                       | 001 | / IVIUIRD  |
|    | b) | Write short notes on:                                                                                                                                | CO1 | 7 Marks    |
|    | ,  | i) Pre-grout investigation. ii) Post grout test.                                                                                                     |     |            |
|    |    | iii) Grout holes pattern. iv) Selection of grout characteristics.                                                                                    |     |            |
|    |    | (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    |

Time: 3 hours

- 9. a) What is soil reinforcement? List various materials to be used as soil CO6 7 Marks reinforcement. Discuss the internal stability aspects of reinforced earth walls.
  - b) Provide one application each of geomembrane and geogrid types of CO1 7 Marks reinforcements.

#### (OR)

- 10. a) Explain the factors governing the design of reinforced soil walls. Write the CO1 5 Marks construction sequence of a reinforced earth wall with vertical faces.
  - b) Design a 7m high geogrid-reinforced wall where the reinforcement spacing CO3 9 Marks 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.,  $L \sim 4.9m$ ). Additional details of the problem including soil and geogrid data are shown in the diagram below.



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#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

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

# POWER SYSTEM OPERATION AND CONTROL

[Electrical and Electronics Engineering]

Max. Marks: 70

#### Time: 3 hours

### 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 CO4 14 Marks characteristics:

| $F_1(P_1) = 570 + 7.5P_1 + 0.0017P_1^2 \text{ Rs/Hr}$ | $600 \text{MW} \le \text{P}_1 \le 150 \text{MW}$ |
|-------------------------------------------------------|--------------------------------------------------|
| $F_2(P_2) = 380 + 7.8P_2 + 0.002P_2^2 \text{ Rs/Hr}$  | $500 \text{MW} \le \text{P}_1 \le 125 \text{MW}$ |
| $E(D) = 200 \pm 7.0D \pm 0.005D^2 D_{a}/U_{a}$        | $(00)$ AUV $\neq$ D $\neq$ 150 AUV               |

 $F_3(P_3) = 200 + 7.9P_3 + 0.005P_3^2 \text{ Rs/Hr}$  600MW  $\leq P_1 \leq 150$ MW

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 CO1 7 Marks forecasting modal.
  - 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 CO6 12 Marks for short term scheduling. State the assumptions made.

#### (OR)

4. Describe the hydro-thermal economic load scheduling. Derive the CO2 14 Marks necessary equations.

### UNIT-III)

- 5. a) What do you mean by unit commitment? Discuss various constraints CO2 7 Marks related to unit commitment problem.
  - b) Does Unit Commitment guarantee economic power of power generation? CO2 7 Marks Justify your answer.

(OR)

6. Discuss in detail, the priority list method for the solution of unit CO2 14 Marks commitment problem with an example.

### 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 CO2 7 Marks

b) Draw and explain the block diagram representation of IEEE Type-1 CO2 7 Marks model.

#### (OR)

- 8. a) Design a static var compensator for a low voltage distribution system with CO3 7 Marks the following specifications.
  - System voltage= 400VFrequency, f= 50HzCoil 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.

b) Brief the merits of uncompensated transmission lines over compensated CO2 7 Marks transmission lines.

#### UNIT-V

9. For a single area system, show that the static error in frequency can be CO2 14 Marks reduced to zero with integral control.

#### (OR)

10. Explain the functioning of speed governing system and obtain its CO1 14 Marks necessary mathematical modeling with neat diagram.



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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]

Max. Marks: 70

SVEC-16

#### 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:<br>i) Reactance relay.<br>ii) Mho 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  |
| 4. | a) | Define and explain the following terms concerned to the protective device fuse.                                                                                                                                                                                                                                                                                                                                                                                                                             | CO1 | 6 Marks  |
|    |    | i) Fusing current. ii) Cut off current.                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |          |
|    | 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, $11 \text{ kV}/ 132 \text{ kV}$ , 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  |
| 6. |    | <ul> <li>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: <ol> <li>The percentage of the winding which remains unprotected.</li> <li>The minimum value of the earthing resistance required</li> </ol> </li> </ul> | CO4 | 14 Marks |
|    |    | to protect 80% of the winding.                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |          |

# (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                            | CO2 | 7 Marks |
|     | -) | their applications to distance protection.                                                    |     |         |
|     |    | (OR)                                                                                          |     |         |
| 8.  | a) | Discuss various methods of protection of a transmission line and                              | CO2 | 7 Marks |
|     | ,  | enumerate the advantages and disadvantages of each method.                                    |     |         |
|     | 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                      | CO5 | 7 Marks |
|     |    | 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.                                                    |     |         |
|     | b) | What are the various adverse effects of not following the proper earthing                     | CO6 | 7 Marks |
|     |    | techniques in designing of generators and transformers?                                       |     |         |
|     |    | (OR)                                                                                          |     |         |
| 10. | a) | Write a short notes on:                                                                       | CO1 | 6 Marks |
|     |    | i) Reactance grounding.                                                                       |     |         |
|     |    | ii) Arc suppression coil grounding.                                                           |     |         |
|     | b) | A 50 Hz overhead line has line to earth capacitance of 1.2 $\mu$ F. It is desired             | CO4 | 8 Marks |
|     |    | to use earth fault neutralizer. Determine the reactance to neutralize the                     |     |         |
|     |    | capacitance of :                                                                              |     |         |
|     |    | i) 100% of the length of the line.                                                            |     |         |
|     |    | (1) 000/ - f 41 - 1 41 - f 41 - 1                                                             |     |         |

- ii) 90% of the length of the line.iii) 80% of the length of the line.

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SVEC-16 Roll No.

### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021 FLEXIBLE AC TRANSMISSION SYSTEMS

[Electrical and Electronics Engineering]

| Time | Max. Marks: 70 |                                                                                                                                                                                                                                                                                                                                                                    |        |             |
|------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-------------|
|      |                | Answer One Question from each Unit                                                                                                                                                                                                                                                                                                                                 |        |             |
|      |                | All questions carry equal marks                                                                                                                                                                                                                                                                                                                                    |        |             |
|      |                |                                                                                                                                                                                                                                                                                                                                                                    |        |             |
| 1    | a)             | Discuss the need of reactive newer control in electrical transmission                                                                                                                                                                                                                                                                                              | CO1    | 7 Mortes    |
| 1.   | a)<br>b)       | Explain the concept of power flow in a simple two machine system                                                                                                                                                                                                                                                                                                   | CO1    | 7 Marks     |
|      | 0)             | Determine the active and reactive power flows in the system.                                                                                                                                                                                                                                                                                                       | 002    | / IVIAIKS   |
|      |                | (OR)                                                                                                                                                                                                                                                                                                                                                               |        |             |
| 2.   | a)             | Enumerate the relative importance of controllable parameters.                                                                                                                                                                                                                                                                                                      | CO1    | 8 Marks     |
|      | b)             | Give the advantages of FACTS controllers                                                                                                                                                                                                                                                                                                                           | CO2    | 6 Marks     |
|      | ,              |                                                                                                                                                                                                                                                                                                                                                                    |        |             |
| 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<br>end of the transmission line.                                                                                                                                                                                                                                                            | CO2    | 8 Marks     |
|      |                | UNIT-III)                                                                                                                                                                                                                                                                                                                                                          |        |             |
| 5.   | a)             | The voltage magnitudes at the buses are reducing with the enhancement<br>of the load. If the load is still increased, the system may collapse. Show<br>with an appropriate compensation, the voltage profile should be<br>maintained with the increase in the load                                                                                                 | CO4    | 6 Marks     |
|      | b)             | Draw the control scheme for STATCOM and explain                                                                                                                                                                                                                                                                                                                    | $CO^2$ | 8 Marks     |
|      | 0)             | (OR)                                                                                                                                                                                                                                                                                                                                                               | 002    | 0 Ivitariks |
| 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<br>in the transmission line between bus-1 and bus-2 is 40 MW. The<br>respective transmission line capacity is 50 MW. If there is a sudden<br>increase in the load up to 20 MW at bus-2, what happens to the<br>transmission line? Design a suitable compensator for rectifying the above | CO3    | 8 Marks     |

- 9. a) A FACTS device having a combination of two or more series CO5 7 Marks 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.
  - b) Derive the expression for real and reactive power between two nodes of CO2 7 Marks UPFC

### (OR)

- 10. a) Write the objectives of Voltage and Phase Angle Regulators. Explain the CO1 7 Marks power flow control by Phase Angle Regulators.
  - b) Explain the power transfer capability of UPFC and compare its CO2 7 Marks capabilities with other FACTS controllers.

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a)

b)

a)

b)

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

Roll No.

#### 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 What is power quality and explain various power quality issues in detail? CO1 7 Marks Discuss the responsibilities of suppliers and end users of electric power. CO1 7 Marks (**OR**) Explain the various types of power quality disturbances and their impact CO1 7 Marks on power systems. Mention major reasons for the increased concern in power quality. CO2 7 Marks UNIT-II ) Define waveform distortion. Explain the wave form distortion categories. CO1 7 Marks With neat schematic, explain in detail about short duration variations. CO1 7 Marks (**OR**) Investigate the role of UPS system in providing solution for power quality CO4 14 Marks problems and improvement of power quality. UNIT-III) Explain briefly about harmonic distortion and waveform distortion. 7 Marks CO1 Brief out the effect of harmonic distortion on capacitors and transformers. CO1 7 Marks (**OR**) Explain a Passive filter design criteria and practical considerations used CO3 14 Marks for design. UNIT-IV) Explain the significance of Power quality monitoring. What are the CO1 10 Marks important power quality monitoring standards? What are the advanced measuring devices for power quality monitoring? CO1 4 Marks (**OR**) Illustrate the power quality benchmarking process. CO1 7 Marks Identify a suitable power quality monitoring and measuring device to CO5 7 Marks measure flicker and explain with functional blocks. UNIT-V Explain in detail about the distributed generation and its impacts on the CO1 14 Marks network. (**OR**) Briefly discuss the power quality issues related to DG integration in CO6 14 Marks distribution networks.

> 69 (P) Ð

#### **SREE VIDYANIKETHAN ENGINEERING COLLEGE**

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

Roll No.

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

#### SOFT COMPUTING TECHNIQUES

[Electrical and Electronics Engineering]

| Time | e: 3 ho       | purs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Max.   | Marks: 70           |
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|      |               | Answer One Question from each Unit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |                     |
|      |               | All questions carry equal marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                     |
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| 1    | a)            | Compare ANN with BNN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | CO1    | 7 Marks             |
| 1.   | h)            | Explain various architectures of ANN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | CO1    | 7 Marks             |
|      | 0)            | OR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 001    | / 1 <b>110111</b> 5 |
| 2    | a)            | What is Linear separability? Single layer perceptron cannot solve XOR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | CO2    | 6 Marks             |
| 2.   | u)            | problem. Explain.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 002    | 0 10141110          |
|      | b)            | Discuss various learning strategies in detail.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | CO1    | 8 Marks             |
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| 3    | a)            | Discuss the limitations of Back propagation neural networks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | CO1    | 5 Marks             |
| 5.   | $\frac{a}{b}$ | Explain the application of ANN in Electrical load forecasting in detail                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | CO6    | 9 Marks             |
|      | 0)            | (OR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 000    | ) WILLING           |
| 4    | a)            | Explain the architecture and training algorithm of back propagation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | CO1    | 8 Marks             |
|      | ••)           | neural network.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 001    | 0 1111110           |
|      | b)            | Discuss the Kohonen self-organizing map in brief.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | CO1    | 6 Marks             |
|      |               | (UNIT-TIT)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |        |                     |
| 5    | a)            | Contrast crisp and fuzzy sets                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | $CO^2$ | 6 Marks             |
| 5.   | h)            | For the following fuzzy relation find the max-min and max-product                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | CO4    | 8 Marks             |
|      | 0)            | $\begin{bmatrix} 0.5 & 0.4 \end{bmatrix} \sim \begin{bmatrix} 0.6 & 0.2 & 0.4 \end{bmatrix}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 001    | 0 marks             |
|      |               | compositions. $\widetilde{R1} = \begin{bmatrix} 0.5 & 0.1 \\ 0.7 & 0.2 \end{bmatrix} \widetilde{R2} = \begin{bmatrix} 0.0 & 0.2 & 0.1 \\ 0.2 & 0.1 & 0.5 \end{bmatrix}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |        |                     |
|      |               | $\begin{bmatrix} 0.7 & 0.3 \end{bmatrix}$ $\begin{bmatrix} 0.2 & 0.1 & 0.5 \end{bmatrix}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |                     |
|      |               | (OR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |        |                     |
| 6.   | a)            | Two Fuzzy sets A and N are defined on X as follows.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | CO4    | 9 Marks             |
|      |               | $\mathbf{X}$ |        |                     |
|      |               | $ \begin{array}{cccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |                     |
|      |               | <b>N</b> $0.6$ $0.8$ $0.6$ $0.9$ $0.5$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        |                     |
|      |               | Find the following $\alpha$ cut sets $(\tilde{a}, \alpha, \tilde{b}) = (\tilde{a}, \alpha, \tilde{b})$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        |                     |
|      | 1 \           | 1) $(A     N)_{0.2}$ 11) $(A \cup N)_{0.5}$ 111) $(A     A)_{0.8}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 001    | 5 ) ( 1             |
|      | b)            | What is the role of membership function in fuzzy logic? List out                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | COI    | 5 Marks             |
|      |               | various methods of membership value assignment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                     |
| _    |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |                     |
| 7.   | a)            | What is Defuzzification? Explain any one defuzzification method in                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | CO1    | 7 Marks             |
|      | 1 \           | detail.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 001    |                     |
|      | b)            | Design the rule base for Speed control of DC motor using fuzzy logic.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 003    | / Marks             |
| 0    | 2)            | (UR)<br>Discuss Controld method of defumification in detail                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | CO1    | 5 Marita            |
| ð.   | a)<br>b)      | Discuss Centroid method of defuzzification in detail.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        | 5 Marks             |
|      | 0)            | Explain the application of Fuzzy logic in speed control of DC motors.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 000    | 9 IVIALKS           |
| 0    |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 001    | - > < 1             |
| 9.   | a)            | List and explain the advantages and limitations of Genetic algorithms.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | COI    | 7 Marks             |
|      | b)            | Comprehend the encoding process of genetic algorithms.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | COI    | / Marks             |
| 10   |               | (UK)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | COF    | 0 1 ()              |
| 10.  | a)            | Apply Genetic algorithms for optimal allocation of capacitors in distribution system. Explain in detail                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 005    | 9 Marks             |
|      | <b>b</b> )    | uisuiton system. Explain in detail.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | CO1    | 5 Marko             |
|      | UJ            | Encluare the mutation process in detail.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | COI    | JIVIAIKS            |

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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

#### FINITE ELEMENT METHOD [Mechanical Engineering]

Max. Marks: 70

SVEC-16

#### **Answer One Question from each Unit** All questions carry equal marks

### UNIT-I

- Explain natural coordinate system. Derive expression for relation between CO1 1. a) 7 Marks natural and Cartesian coordinate systems.
  - Explain the significance of node numbering and element numbering CO1 b) 7 Marks during the discretization Process.

(**OR**)

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

steel  
Aluminium  

$$2m$$
  
 $2m$   
 $2m$   
 $2m$   
 $20KN$   
 $A_{st}=4*10^{-4}m^{2}$   
 $E_{al}=70Gpa$   
 $A_{al}=2*10^{-4}m^{2}$ 

### UNIT-II )

3. Consider the plane truss shown in figure. Determine the nodal CO2 14 Marks displacements and support reactions. Take  $E= 2 \times 10^{5} \text{N/mm}^{2}$ . A=1500 mm<sup>2</sup>.



For the loaded beam shown in figure, determine the slope and deflection CO2 4. 14 Marks at node 2 using finite element concept. Take EI=900 Nm<sup>2</sup>.



### UNIT-III

5. A long cylinder of inside diameter 80 mm and outside diameter 120 mm CO3 14 Marks 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  $\mu = 0.3$ .

#### (OR)

 Determine the stiffness matrix for the Constant Strain Triangle (CST) CO3 14 Marks 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.



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



(**OR**)

8. Determine the temperature distribution through the composite wall shown CO4 14 Marks in figure when convective heat loss occurs on the left surface. Assume unit area. Thickness  $t_1 = 4$ cm,  $t_2 = 2$ cm,  $K_1 = 0.5$ W/cm K,  $K_2 = 0.05$ W/cm K,  $T\alpha = -5^{0}$ C, h = 0.1 W/cm<sup>2</sup> K.



9. Determine the Eigen values and Eigen Vectors for the stepped bar as CO5 14 Marks shown in figure.



10. Evaluate the lowest Eigen value and the corresponding Eigen modes for CO6 14 Marks the beam shown in figure. E=200 GPa and  $\rho = 7840$ kg/m<sup>3</sup>, I=2000 mm<sup>4</sup>, A=240 mm<sup>2</sup>, L=300mm.



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

### **OPERATIONS RESEARCH**

[Mechanical Engineering]

Max. Marks: 70

SVEC-16

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. CO1 14 Marks 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.

#### (**OR**)

2. Solve the following problem using Big-M Method Maximize  $Z = 2X_1 + 4X_2$ , Subject to the constraints

 $2X_1 + X_2 \leq 18$  $3X_1 + 2X_2 \ge 30$  $X_1 + 2X_2 = 26$  $X_1, X_2 \ge 0.$ 

#### UNIT-II

- 3. Outline the steps in Hungarian method. a)
  - Consider the problem in which two factories supply three stores with a b) 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:

|            | F1 | F2 | <b>S1</b> | <b>S2</b> | <b>S3</b> |  |  |
|------------|----|----|-----------|-----------|-----------|--|--|
| F1         | 0  | 5  | 7         | 4         | 9         |  |  |
| F2         | 5  | 0  | 6         | 2         | 3         |  |  |
| <b>S1</b>  | 7  | 2  | 0         | 5         | 1         |  |  |
| <b>S2</b>  | 2  | 5  | 1         | 0         | 4         |  |  |
| <b>S</b> 3 | 8  | 7  | 5         | 6         | 0         |  |  |
| (OR)       |    |    |           |           |           |  |  |

4. Find the optimal solution to the following transportation problem

| Destination |        |    |    |    |    |        |  |
|-------------|--------|----|----|----|----|--------|--|
|             |        | Р  | Q  | R  | S  | Supply |  |
|             | А      | 21 | 16 | 25 | 13 | 11     |  |
| Origin      | В      | 17 | 18 | 14 | 23 | 13     |  |
|             | С      | 32 | 17 | 18 | 41 | 19     |  |
|             | Demand | 6  | 10 | 12 | 15 | 43     |  |

CO2 14 Marks

CO<sub>4</sub> 6 Marks

CO4 8 Marks

14 Marks CO3

1

### UNIT-III)

- 5. a) What do you understand by zero sum and non zero sum game? What CO6 7 Marks do you mean by strategy, dominance and saddle point?
  - b) Solve the following game using graphical approach.

CO6 7 Marks

|              | B's Strategy |   |    |    |  |  |
|--------------|--------------|---|----|----|--|--|
| A's Strategy | 8            | 5 | -7 | 9  |  |  |
|              | -6           | 6 | 4  | -2 |  |  |
| (OR)         |              |   |    |    |  |  |

6. The probability distribution of the failure time of certain time of electric CO6 14 Marks bulb is given below

| Week                      | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8   |
|---------------------------|------|------|------|------|------|------|------|-----|
| Probability<br>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<br>time(days)  | 4   | 10  | 3   | 4   | 15  | 4   | 5   | 5   |
| Pessimistic time<br>(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 CO5 14 Marks activities to find the time cost trade-off points that company should want to consider. Start with the plan that has the longest duration.

| Activity | Preceding | Time (v | veeks) | Cost (Rs.) |       |  |
|----------|-----------|---------|--------|------------|-------|--|
| Activity | Activity  | Normal  | Crash  | Normal     | Crash |  |
| А        | -         | 2       | 1      | 20000      | 20700 |  |
| В        | -         | 3       | 1      | 29000      | 33000 |  |
| С        | А         | 2       | 1      | 25000      | 26100 |  |
| D        | В         | 4       | 3      | 47000      | 47750 |  |
| Е        | С         | 4       | 2      | 55000      | 57000 |  |
| F        | С         | 3       | 2      | 29000      | 29500 |  |
| G        | D, E      | 5       | 3      | 79000      | 80800 |  |
| Н        | F,G       | 2       | 1      | 15000      | 17900 |  |

- 9. a) What are the basic elements of a waiting line model?
  - b) An oil company is constructing a service station on a high way. Traffic CO3 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.
    - 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 CO5 14 Marks 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.

| Category   | Time required<br>(Minutes) | Probability of<br>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.

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CO3 4 Marks

03 10 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

CRYOGENICS

#### [Mechanical Engineering]

Max. Marks: 70

SVEC-16

#### 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.<br>"The production of dry-ice is more difficult in hot summer compared with<br>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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#### IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

#### **INDUSTRIAL ROBOTICS** [Mechanical Engineering]

Max. Marks: 70

SVEC-16

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

### UNIT-I

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| 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 <sup>o</sup> about Z axis followed by rotation of 45 <sup>o</sup> 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. $\bigotimes \ \bigotimes \ \bigotimes$                                                                                                                                            | CO6 | 14 Marks |
|     |    |                                                                                                                                                                                                                                                                                                    |     |          |

#### 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

Answer One Question from each Unit

Max. Marks: 70

SVEC-16

# 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, CO3 14 Marks exponential smoothing and linear regression analysis, which forecasting technique would you consider the most accurate? Why?

#### (OR)

4. A manufacturer of tricycles for children in the age group of two to four CO3 14 Marks 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.

| X | New marriages           | 201 | 236 | 211 | 198         | 225 | 240 | 218 | 226 |
|---|-------------------------|-----|-----|-----|-------------|-----|-----|-----|-----|
| Y | Demand for<br>tricycles | 175 | 194 | 180 | <b>16</b> 5 | 190 | 172 | 182 | 170 |

### UNIT-III

5. Write a brief note on Chase, Level and mixed strategies for Aggregate CO1 14 Marks Production Planning.

#### (OR)

6. "Mixed strategies are always superior to pure strategies in an aggregate CO1 14 Marks production planning exercise". Comment on this statement."

### UNIT-IV

7. List out the functions of CRP using block diagram and explain the CO1 14 Marks function with an example.

#### (OR)

8. Give the difference between MRP and MRP II and explain MRP – II with CO1 14 Marks Block diagram.

Explain Johnson's algorithm in Flow shop scheduling. There are 5 jobs CO6 14 Marks each of which must go through 2 machines A and B in order immediately processing Times are given below.

|            | 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 CO6 14 Marks 5 jobs and 3 machines.

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.

|    | Α  | В  | С  |
|----|----|----|----|
| J1 | 18 | 12 | 16 |
| J2 | 10 | 11 | 14 |
| J3 | 20 | 15 | 13 |
| J4 | 15 | 19 | 19 |
| J5 | 16 | 16 | 15 |

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9.

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

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

#### POWER PLANT ENGINEERING [Mechanical Engineering]

Max. Marks: 70

SVEC-16

#### 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 CO1 7 Marks features.
  - b) What are the feeding systems of pulverized coal into the furnace? What CO3 7 Marks are the two design conditions to be satisfied to burn pulverized coal successfully?

#### (OR)

2. Describe the components and working of electrostatic precipitator dust CO2 14 Marks collection in a steam power plant.

#### 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 CO3 7 Marks diesel engine power plant?

#### (**OR**)

4. Identify essential components of a simple open cycle gas turbine plant. CO4 14 Marks How inter cooling and regeneration help in improving the thermal efficiency of the plant?

### UNIT-III)

- 5. a) Draw the line diagram and explain the working of the pressurized water CO1 7 Marks reactor.
  - 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 CO4 14 Marks site and design of hydroelectric power plants.

### 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 CO2 7 Marks geothermal power plant.

#### (OR)

8. Classify biogas plants and explain anyone type of biogas plant with neat CO2 14 Marks sketch.

Time: 3 hours
## UNIT-V

- 9. a) The yearly duration curve of a certain plant can be considered as a CO6 7 Marks 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.
  - b) Draw the load curve for the power requirement in India and discuss the CO6 7 Marks methods to accomplish the part load conditions.

#### (OR)

- 10. a) Identify the impact on the environment and human health for the effluents CO5 7 Marks released from the thermal power plants.
  - b) Discuss the harmful effects of CO<sub>2</sub>, CO, compounds of sulphur and CO5 7 Marks oxides of Nitrogen.

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Max. Marks: 70

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

## **CELLULAR AND MOBILE COMMUNICATIONS**

[Electronics and Communication Engineering]

Time: 3 hours

### 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 CO1 7 Marks environment and brief about the model of transmission medium.
  - b) Using the concept of Frequency Reuse channels, derive the relation for CO2 7 Marks Frequency Reuse distance 'D' as a function of reuse pattern and cell size.

### (OR)

- 2. a) Illustrate various criteria used to specify the performance of a cellular CO1 7 Marks system.
  - b) Define Co-channel Interference and derive the relation for Co-channel CO2 7 Marks Interference factor in a cell with its k<sup>th</sup> Co-channel Interfering cell.

## UNIT-II

- 3. a) Classify and describe about various adjacent channel Interference CO1 7 Marks mechanisms.
  - b) What is Diversity receiver? Illustrate how diversity receiver can be used CO6 7 Marks to improve performance of the system even in low transmitted power levels.

#### (**OR**)

- 4. a) Summarize about Umbrella pattern effect and List the benefits of CO1 7 Marks Umbrella pattern.
  - b) Illustrate how cell site location, decrease in power and Antenna height CO4 7 Marks effect coverage and interference problems.

## 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, CO3 8 Marks Mobile antenna height is 3m and Path length is 5km, Find;
    - i) Incident angle. ii) Elevation angle.

### (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, CO3 8 Marks 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.

## UNIT-IV

- 7. a) Analyze how adjacent channel and Co-channel interference can be CO4 7 Marks controlled using Underlay-overlay arrangement.
  - b) Differentiate Soft handoff and Hard handoff. Conclude the usage of Soft CO5 7 Marks handoffs in CDMA systems.

#### (OR)

- 8. a) Outline various methods used to solve the problem of channel assignment CO4 7 Marks to travelling mobile units.
  - b) Identify the handoff algorithm which is more appropriate during CO5 7 Marks unavailability of free channels when crossing a cell boundary.

### 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 CO6 7 Marks standards.

#### (OR)

- 10. a) Differentiate three standard 3G systems. Also mention the features of 3G CO6 7 Marks standard systems.
  - b) Define Authentication and explain about Authentication of MS data CO1 7 Marks bursts.

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#### 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 Discuss memory classification in a typical embedded system. CO3 1. 7 Marks a) Review various functional blocks in MSP430. b) CO1 7 Marks (**OR**) 2. Generalize the characteristics of a typical Embedded system. CO1 7 Marks a) Interpret with an example embedded system where MSP430X can fit. b) CO3 7 Marks UNIT-II Discuss MSP430 instructions which can be used to control program flow. CO5 3. 7 Marks a) b) Explore conditions of MSP430 after reset. CO2 7 Marks (**OR**) 4. Discuss various shift and rotate instructions possible in assembly CO5 7 Marks a) programming. Give out example instructions for binary arithmetic instructions with two CO2 b) 7 Marks operands. UNIT-III) Interrupts are like functions that are called by hardware rather than 5. CO6 7 Marks a) software - support the statement with suitable reasoning. Paraphrase the importance of interrupts and issues associated while CO5 7 Marks b) describing Interrupt service routines. (**OR**) Demonstrate passing parameters and returning results using subroutines 6. a) CO6 7 Marks with suitable example. Distinguish the similarities and dissimilarities with reference to ISR CO5 b) 7 Marks (Interrupt Service Routine) to a subroutine. UNIT-IV) Discuss various modes of operation of USCI-A. 7. CO1 7 Marks a) Compose configuring Real Time Clock and associate control register to b) CO3 7 Marks handle interrupt from basic timer 1. (**OR**) Paraphrase the Architecture and operation of ADC10 in MSP430. 8. CO1 a) 7 Marks Develop mechanism to measure charging and discharging times of RC b) CO3 7 Marks circuit using comparator A and timer 2. UNIT-V 9. Explore architectural models suitable for synthesis of co-design models. CO<sub>2</sub> 7 Marks a) List various technical communication models suitable for IOT CO4 7 Marks b) implementation. (**OR**) 10. Define Model. List the qualities a good model should process. CO1 7 Marks a) IPV6 has made the ground ready for IOT to take on – discuss the issue CO4 b) 7 Marks with an eye on IPV4 limitations.

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

### **MICROWAVE ENGINEERING**

[Electronics and Communication Engineering]

Max. Marks: 70

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

## (UNTT-T)

| 1. | a)<br>b) | Using principle of faraday rotation, explain the action of Circulator.<br>An isolator has an insertion loss of 0.5dB and an isolation of 30dB.<br>Determine the scattering matrix of the isolator if the isolated ports are<br>perfectly matched to the junction. | CO5<br>CO4 | 7 Marks<br>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<br>H-plane Tee. Determine the powers in the remaining ports when other<br>ports are terminated by means of matched loads.                                                             | CO4        | 7 Marks            |
| 2  | ``       |                                                                                                                                                                                                                                                                   | 000        |                    |
| 3. | a)       | Derive the expressions for output power and efficiency of a two-cavity<br>Klystron Amplifier.                                                                                                                                                                     | CO2        | / Marks            |
|    | b)       | Justify the role of Magnetron in microwave communication system.<br>(OR)                                                                                                                                                                                          | CO6        | 7 Marks            |
| 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            |
| -  | ``       |                                                                                                                                                                                                                                                                   | 000        |                    |
| 5. | a)       | Develop a Gunn diode using N-type GaAs Specimen and explain its operation.                                                                                                                                                                                        | CO3        | / 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            |
| 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 $5\mu$ 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            |
|    |          |                                                                                                                                                                                                                                                                   |            |                    |

Time: 3 hours

## UNIT-V

CO1 8 Marks

- 9. a) Explain the terms :
  - i) Ray path.
  - ii) Critical frequency.
  - iii) Lowest usable frequency.
  - b) Calculate the skip distance for flat earth with MUF of 10 MHz if the wave CO4 6 Marks is reflected from a height of 300km where the maximum value of 'n' is 0.9.

### (OR)

- 10. a) Describe any two types of fading normally encountered in radio wave CO1 8 Marks propagation.
  - b) Derive the relation between Maximum Usable Frequency and skip CO2 6 Marks distance assuming the earth is flat.

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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.<br>(OR)                                                                                                | CO2 | 7 Marks |
| 4.  | a) | Explain the steps involved in operation of mobile IP.                                                                                                            | CO1 | 6 Marks |
|     | b) | Demonstrate data transfer process in wireless network.                                                                                                           | CO2 | 8 Marks |
|     |    | 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.                                                                                                                                        |     |         |
|     |    | 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. (OR)                                                                                       | CO1 | 6 Marks |
| 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 laver                                                                                         | CO1 | 7 Marks |
|     | b) | Apply overlay technology to a wireless network and illustrate the operation of GPRS.                                                                             | CO5 | 7 Marks |

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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 CO1 7 Marks circuit.
  - b) Illustrate the constraints on Vt reduction which is used to minimize CO6 7 Marks dynamic power dissipation.

### (OR)

- 2. a) Write an explanatory notes on physics of power dissipation in MOSFET CO1 7 Marks Devices.
  - b) Appraise the technology and device innovations for novel high speed low CO6 7 Marks power VLSI devices.

## 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 CO4 7 Marks from a circuit has been observed to have  $\pm 10\%$  fluctuation from the mean. How many samples are required so that we are 95% confidence that the error of sample mean is within  $\pm 10\%$ ?

#### (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 CO4 7 Marks 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%?

## 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 CO6 7 Marks applications.

### (OR)

- 6. a) Design a differential latch for high speed low power application and CO3 7 Marks discuss its functionality.
  - b) Discuss Bus invert encoding to achieve low power with relevant CO2 7 Marks equations.

## 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.
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 CO1 7 Marks filters.
  - b) Categorize the Power dissipation of uniprocessing and parallel processing CO2 7 Marks systems.

## (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 CO4 7 Marks sketches

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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

SVEC-16

Answer One Question from each Unit All questions carry equal marks

## UNIT-I

| 1. | a) | A commonly used approximation to glottal pulse is $g(n) = \begin{cases} na^n & n \ge 0 \\ 0 & otherwise \end{cases}$                                                                             | CO2 | 7 Marks |
|----|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------|
|    |    | i) Find the 7 transforms of a (u) and elected its forming transforms                                                                                                                             |     |         |
|    | 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) $R_n(k) \le R_n(0)$ .                                                                                                                                                  |     |         |
|    | b) | Define short time average magnitude difference function and contrast with autocorrelation function.                                                                                              | CO1 | 6 Marks |
|    |    | (OR)                                                                                                                                                                                             |     |         |
| 4. | a) | How pitch, energy and average magnitude function of a speech signal are extracted? Bring out the features of these parameters that will help us to build an automatic speech recognition system. | CO2 | 7 Marks |
|    | b) | What is autocorrelation and state some of the properties.                                                                                                                                        | CO1 | 7 Marks |
|    |    | (UNIT-III)                                                                                                                                                                                       |     |         |
| 5. | a) | Consider all pole model for the combined vocal tract, glottal pulse and radiation system of the form $H(Z) = \frac{G}{1 - \sum_{r=1}^{P} A_r Z^{-K}}$ .                                          | CO4 | 7 Marks |
|    |    | Obtain The Recursion Relation Between The Complex Censtrum 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. Explain in detail how to solve LPC equations using Cholesky CO3 7 Marks a) decomposition method. Explain how to tract the formants using LPC. **b**) CO5 7 Marks (**OR**) Discuss the Durbin's recursive method and Cholesky decomposition CO3 8. 8 Marks a) method used for estimating and obtaining LPC of a speech signal. Determine speech segment and the limits on the prediction error CO5 6 Marks b) summation using covariance method. UNIT-V
- 9. a) Derive the decision rule which minimizes the probability of error for CO6 8 Marks identifying the speaker
  - 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 CO1 8 Marks features.
  - b) Discuss briefly about basic pattern recognition approaches in the speech CO1 6 Marks recognition system.

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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,<br>Write Types of keys and Values mapper, Reducer, Combiner with<br>examples. | CO4 | 7 Marks  |
|    | b) | Define the following Scheduler:                                                                                                                    | CO1 | 7 Marks  |
|    |    | i) FIFO Scheduler                                                                                                                                  |     |          |
|    |    | ii) Capacity Scheduler.                                                                                                                            |     |          |
|    |    | 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                                                                            | CO2 | 7 Marks  |

with an example.

# 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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Roll No.

### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

### HUMAN COMPUTER INTERACTION

[Computer Science and Engineering, Information Technology]

Time: 3 hours

Max. Marks: 70

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

## UNIT-I

| 1.  | a) | List and explain the set of principles guided the design of Xerox STAR.            | CO3 | 7 Marks  |
|-----|----|------------------------------------------------------------------------------------|-----|----------|
|     | b) | Explain the characteristics of a web interface in detail.                          | CO2 | 7 Marks  |
|     |    | (OR)                                                                               |     |          |
| 2.  | a) | Differentiate the characteristics of internet and intranet with brief explanation. | CO2 | 7 Marks  |
|     | b) | Briefly explain the concept of direct manipulation.                                | CO1 | 7 Marks  |
|     |    | UNIT-II                                                                            |     |          |
| 3.  | a) | How to determine the requirements of a user?                                       | CO2 | 10 Marks |
|     | b) | Define Business.                                                                   | CO1 | 4 Marks  |
|     |    | (OR)                                                                               |     |          |
| 4.  | a) | Explain how to conduct a Face-to-Face interview for requirement analysis.          | CO4 | 7 Marks  |
|     | b) | Describe the process of understanding the User's mental model.                     | CO2 | 7 Marks  |
|     |    | UNIT-III                                                                           |     |          |
| 5.  | a) | Classify various types of statistical graphics.                                    | CO1 | 6 Marks  |
|     | b) | Explain any four qualities which provide visually pleasing composition.            | CO1 | 8 Marks  |
|     |    | (OR)                                                                               |     |          |
| 6.  | a) | What is a Screen? What is the purpose of a screen?                                 | CO1 | 4 Marks  |
|     | b) | Elaborate the steps for organizing and ordering of screen elements.                | CO2 | 10 Marks |
|     |    | UNIT-IV                                                                            |     |          |
| 7.  | a) | Explain the procedure for choosing colors in screen design.                        | CO2 | 7 Marks  |
|     | b) | Predict what are the possible problems with color.                                 | CO5 | 7 Marks  |
|     |    | (OR)                                                                               |     |          |
| 8.  | a) | Define an icon. Describe different kinds of icons in detail.                       | CO1 | 6 Marks  |
|     | b) | Articulate the good icon design guide lines in detail.                             | CO3 | 8 Marks  |
|     |    | UNIT-V                                                                             |     |          |
| 9.  | a) | How speech-based interface design helps the disabled people? Explain               | CO6 | 7 Marks  |
|     | b) | Explain the Indirect pointing devices and drivers.                                 | CO2 | 7 Marks  |
|     |    | (OR)                                                                               |     |          |
| 10. | a) | Explain the criterion for finding the right interface building tools.              | CO5 | 7 Marks  |
|     | b) | Explain the features interface building tools.                                     | CO2 | 7 Marks  |
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IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

### ANALYTICAL INSTRUMENTATION

## [Electronics and Instrumentation Engineering]

Max. Marks: 70

SVEC-16

#### 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            |
| 2.  | a)       | "Sodium analyzer places a vital role in treatment of boiler feed water"                                                                     | CO2      | 7 Marks            |
|     | b)       | Write a short note on silica analyzer.                                                                                                      | CO1      | 7 Marks            |
| 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            |
| Δ   | a)       | Differentiate single and double beam colorimeters                                                                                           | $CO^2$   | 7 Marks            |
| ч.  | a)<br>b) | Pagell the working of FT IP spectrometers.                                                                                                  | $CO_{1}$ | 7 Marko            |
|     | 0)       | UNIT-III                                                                                                                                    | COI      | / IVIAIKS          |
| 5.  | a)       | Elaborate the appropriate spectroscopic technique which is used to<br>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.<br>(OR)                                                                  | CO1      | 7 Marks            |
| 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. (OR)                        | CO1      | 7 Marks            |
| 8.  | a)       | With neat sketch, explain fluorescence detector in detail.                                                                                  | CO1      | 7 Marks            |
|     | b)       | Classify gaschromatography and explain the importance of oven<br>thermostats in gaschromatography.                                          | CO1      | 7 Marks            |
|     |          |                                                                                                                                             |          |                    |
| 0   | a)       | With a next sketch, explain the working of NO <sub>2</sub> monitor                                                                          | CO1      | 7 Marks            |
| ).  | b)       | Justify the role environment pollution monitoring device in the day to day<br>life in the society                                           | CO6      | 7 Marks<br>7 Marks |
|     |          | (OR)                                                                                                                                        |          |                    |
| 10. | a)       | Explain the necessity of X- ray detectors in day today life.                                                                                | CO6      | 7 Marks            |
| 1 . | b)       | With a neat sketch, explain the working of Turbidity and Nephelometer.                                                                      | CO1      | 7 Marks            |
|     |          |                                                                                                                                             |          |                    |

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

#### **BIOMEDICAL SIGNAL PROCESSING** [Electronics and Instrumentation Engineering]

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    | CO1 | 14 Marks |
|-----|----|-----------------------------------------------------------------------------|-----|----------|
|     |    | with a neat block diagram and explain each block in detail?                 |     |          |
|     |    | (OR)                                                                        |     |          |
| 2.  |    | Sketch the diagram of Computer Aided Diagnosis based upon the               | CO1 | 14 Marks |
|     |    | biomedical signal analysis.                                                 |     |          |
|     |    | UNIT-II                                                                     |     |          |
| 3.  |    | What are the potential sources of instrumentation and physiological         | CO2 | 14 Marks |
|     |    | artifacts in recording the Biomedical signal? Propose non-electronic        |     |          |
|     |    | methods to prevent or suppress the latter type of artifacts.                |     |          |
|     |    | (OR)                                                                        |     |          |
| 4.  |    | Explain about the following.                                                | CO2 | 14 Marks |
|     |    | i) Time and frequency domain filtering.                                     |     |          |
|     |    | ii) Homomorphism filtering.                                                 |     |          |
|     |    | 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 | CO3 | 7 Marks  |
|     | ,  | the principle of an adaptive filter.                                        |     |          |
|     |    | (OR)                                                                        |     |          |
| 6.  |    | Explain the significance in Phase Sensitive detector in biomedical signal   | CO3 | 14 Marks |
|     |    | processing and explain its operation with neat sketch.                      |     |          |
|     |    | (UNIT-IV)                                                                   |     |          |
| 7.  |    | Write short notes on:                                                       | CO4 | 14 Marks |
|     |    | i) Detection of Dicrotic notch.                                             |     |          |
|     |    | ii) Correlation Analysis of EEG channels.                                   |     |          |
|     |    | (OR)                                                                        |     |          |
| 8.  |    | Describe the turning point algorithms for ECG data compression in terms     | CO5 | 14 Marks |
|     |    | of data reduction with suitable figures and its disadvantages.              |     |          |
|     |    | UNIT-V                                                                      |     |          |
| 9.  |    | Explain the following terms.                                                | CO6 | 14 Marks |
|     |    | i) Direct FFT.                                                              |     |          |
|     |    | ii) Window functions.                                                       |     |          |
|     |    | (OR)                                                                        |     |          |
| 10. |    | Write a note on spectral estimation in biomedical signals. Explain the      | CO6 | 14 Marks |
|     |    | types of power spectrum estimation.                                         |     |          |

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Time: 3 hours

SVEC-16

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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

SVEC-16

#### 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 CO2 7 Marks input devices are suitable for use with them?
  - b) Compare the functions of the CPU and memory sections of a PLC CO2 7 Marks processor.

#### (**OR**)

- 2. a) There are three machines, each with its own start-stop buttons. Only one CO3 7 Marks may run at a time. Construct a circuit with appropriate interlocking.
  - b) Asses FAIL-SAFE circuits in PLC. Which PLC may be appropriate? CO5 7 Marks Provide justifications for your choice.

## UNIT-II

- Explain about PLC counter and timer operation in a single application. CO1 14 Marks (OR)
   Select a Suitable PLC for develop a sequencer control system to operate a CO5 14 Marks
- 4. Select a Suitable PLC for develop a sequencer control system to operate a CO5 14 Marks basic robot.

## UNIT-III

5. Explain how Token ring and Token Bus Communication Topology for CO1 14 Marks transmit data in Distributed Control Systems.

#### (**OR**)

- 6. a) Illustrate about DCS Integration with PLCs and Computers with an CO1 7 Marks example.
  - 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 CO1 7 Marks register.
  - 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 CO2 14 Marks the MTU. What technology may turn that trend around? Why?

# 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 CO1 7 Marks Network of industrial automation field.

### (OR)

10.Describe in detail about field bus.<br/>i) interoperability.CO114 Marks14 Marks

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

POWER PLANT INSTRUMENTATION

## [Electronics and Instrumentation Engineering]

Max. Marks: 70

CO1

14 Marks

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

# 

- a) Explain the wind power generation with the help of block diagram in CO1 7 Marks detail.
   b) Explain the difference between the help of block diagram in CO2 7 Marks
  - b) Explain the difference between conventional and non conventional CO2 7 Marks sources.

#### (OR)

- 2. a) With neat sketch, describe the process of electric power generation using CO1 7 Marks solar energy.
  - b) Emphasize the objectives of instrumentation and control in power CO2 7 Marks generation.

# UNIT-II

- 3. a) Illustrate the schematic diagram and explain the operations of pressurized CO1 9 Marks water nuclear reactor boiling water reactor.
  - b) Justify how the differential pressure method is used for drum level CO2 5 Marks measurement

#### (**OR**)

- 4. a) Design a measurement system setup to measure steam pressure and steam CO3 7 Marks temperature.
  - b) Select a suitable circuit to measure flue gas presents in boiler and explain CO5 7 Marks its working principle.

## 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 CO1 8 Marks steam temperature.

#### (OR)

- 6. a) Explain an engineering solution to control the combustion for solid fuel CO4 7 Marks fired boiler.
  - b) Design a controller to control Fire side steam temperature and Steam CO3 7 Marks pressure.

## 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 CO3 7 Marks
- of turbine in power plants. (OR)
- 8. a) Illustrate the schematic diagram of turbo alternator cooling system and CO1 7 Marks describe briefly.
  - b) Emphasize the safety measures in controlling the turbine control system. CO6 7 Marks
- 9. a) Specify the importance of electrical safety and maintenance of measuring CO6 7 Marks instruments in power plants.
  - b) Write short notes on explosion hazards and intrinsic safety CO1 7 Marks

10. Discuss in detail about interlocks for boiler operation.

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

## **BIG DATA TECHNOLOGIES**

[Information Technology]

Max. Marks: 70

SVEC-16

### 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<br>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        | 14 Marks |
|     |    |                                                                                      | CO6        |          |
|     |    | UNIT-V                                                                               |            |          |
| 9.  |    | Outline features and services of SQOOP in detail.                                    | CO2        | 14 Marks |
|     |    |                                                                                      | CO5        |          |
|     |    | (OR)                                                                                 |            |          |
| 10. | a) | Elaborate procedure to creating Facebook Database in Hive environment.               | CO5<br>CO5 | 7 Marks  |
|     | b) | Explain Pig and Wukong to explore Billion-edge Network Graphs.                       | CO1<br>CO5 | 7 Marks  |

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

### **MOBILE APPLICATION DEVELOPMENT**

#### [Information Technology]

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  |

| COD  | DE No.  | : 16BT71203                                                                                                                                  |          | SVEC-16   |
|------|---------|----------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------|
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|      | Ν       | V B.Tech I Semester (SVEC-16) Supplementary Examinations Aug                                                                                 | ust – 20 | 021       |
|      |         | INFORMATION RETRIEVAL SYSTEMS<br>[Computer Science and Engineering]                                                                          |          |           |
| Time | e: 3 ho | burs                                                                                                                                         | Max. I   | Marks: 70 |
|      |         | Answer One Question from each Unit<br>All questions carry equal marks                                                                        |          |           |
|      |         | UNIT-I                                                                                                                                       |          |           |
| 1.   | a)      | Distinguish the following:                                                                                                                   | CO2      | 7 Marks   |
|      |         | i) IRS and DBMS.                                                                                                                             |          |           |
|      |         | <ul><li>ii) IRS and Digital Libraries.</li><li>iii) IRS and Data Warehouses.</li></ul>                                                       |          |           |
|      | 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<br>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.                                                                                                                       | CO1      | 14 Marks  |
|      |         | 1) Entity Processing. 11) Categorization.                                                                                                    |          |           |
| 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  |
| 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 <i>FANCY</i> in the string <i>FANCIFUL FANNY FRUIT FILLED MY FANCY</i> .                | 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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IV B.Tech I Semester (SVEC-16) Supplementary Examinations August – 2021

MOBILE COMPUTING

[Information Technology]

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) | 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 CO1 7 Marks behind dynamic source routing compared to other routing algorithms in fixed networks?
  - b) What are the security threats to a MANET? Why a MANET faces grater CO1 7 Marks security threats than a fixed infrastructure networks?

### (OR)

- 10. a) Name mechanisms to improve web access for handheld devices. What is CO1 7 Marks their common problem and what led finally to the development of WAP?
  - b) Explain briefly about the Wireless Datagram Protocol (WDP) of transport CO1 7 Marks layer.

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

# CRYPTOGRAPHY AND NETWORK SECURITY

[Information Technology]

Max. Marks: 70

Time: 3 hours

## 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 " <b>cryptography and network</b> 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:                                                                                      | CO2 | 14 Marks |
|     |    | i) The internet.                                                                                                                            |     |          |
|     |    | ii) A stand alone computer.                                                                                                                 |     |          |
|     |    | 111) Local networks.                                                                                                                        |     |          |

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Roll No.

(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 CO1 9 Marks the following systems.

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 CO1 5 Marks book?
- (OR)
   Consider the following continuously operating job shop. Inter-arrival CO2 14 Marks times of jobs are distributed as follows:

| Time Between<br>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.
b) Write a R program to find factorial of a given number.
CO3 7 Marks 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

- 5. a) List and explain terminology and concepts of statistical models in CO1 9 Marks simulation.
  - b) A production process manufactures alternators for outboard engines used CO3 5 Marks 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?

#### (OR)

- Describe useful statistical models and its situations that arise to conduct CO1 6. a) 9 Marks simulation. An industrial chemical that will retard the spread of fire in paint has been CO4 5 Marks b) 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? (UNIT-IV) 7. Explain the characteristics of queuing systems. CO1 14 Marks (**OR**) 8. Describe important considerations of generating random numbers. 9 Marks CO1 a) Generate random numbers on the interval [0, 1] with 2-digit accuracy. b) CO<sub>4</sub> 5 Marks UNIT-V Synthesize a suitable method for collecting data from stale data and time CO5 9. 14 Marks varying data. (**OR**) Explain the methods for selecting families of input distributions when 10. CO1 11 Marks a) data available is independent and identically distributed.
  - b) Design probability density functions of the Erlang distribution where CO6 3 Marks  $\theta = 2$  and k = 1, 2, 4, and 8.

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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

#### SYSTEMS ENGINEERING [Computer Science and Systems Engineering]

Time: 3 hours

Max. Marks: 70

CO2

14 Marks

SVEC-16

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

## UNIT-I

- 1. a) Compare and contrast between systems engineering and traditional CO1 7 Marks engineering disciplines.
  - b) Write a paragraph explaining what is meant by the statement "Systems CO1 7 Marks 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.

#### (**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 CO1 7 Marks modular system possess? Give a specific example of a modular system and identify the modules.

### UNIT-II)

3. Discuss about the Model of a Complex System.

#### (OR)

4. Give three key activities of a systems engineer that require technical CO2 14 Marks 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?

## UNIT-III)

- 5. a) Illustrate the process of eliciting the needs and requirement analysis in CO3 6 Marks System Engineering.
  - 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 CO3 8 Marks large development project.

## UNIT-IV

- 7. a) Illustrate the types of software systems with respect to systems CO1 9 Marks engineering while in a systems development cycle.
  - b) List the characteristics of a set of well-stated operational requirements, CO4 5 Marks 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?

#### (**OR**)

- 8. a) What are the measures taken to reduce the program risks during systems CO2 9 Marks development cycle? Illustrate.
  - b) Describe and define the principal outputs (products) of the needs analysis CO4 5 Marks phase. List and define the primary systems engineering activities that contribute to these products.

## UNIT-V

9. What specific activities in the advanced development phase sometimes CO1 14 Marks cause it to be referred to as a "risk reduction" phase? Give an example of each activity considering a real or hypothetical system.

### (OR)

10. Graphical user interface software is generally difficult to design and test. CO1 14 Marks 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?

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Roll No.

SVEC-16

### **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 | e: 3 ho | Max. Marks: 70                                                                |     |         |
|------|---------|-------------------------------------------------------------------------------|-----|---------|
|      |         | Answer One Question from each Unit                                            |     |         |
|      |         |                                                                               |     |         |
|      |         | 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 |

Time:

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]

| 3 hours |                                    | Max. Marks: 70 |
|---------|------------------------------------|----------------|
|         | Answer One Question from each Unit |                |
|         | All questions carry equal marks    |                |
|         |                                    |                |
|         |                                    |                |

| 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  |

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(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

## Answer One Question from each Unit

Max. Marks: 70

# 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 |
| 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 |
| 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.<br>(OR)                                                                   | CO3 | 6 Marks |
| 6  | a) | Define the following.<br>i) FACTS.<br>ii) FACTS Controller.                                                                  | CO1 | 6 Marks |
|    | b) | Discuss basic types of FACTS controllers with a neat sketch.                                                                 | CO1 | 8 Marks |
| 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 |
| 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. (OR)                                                       | CO1 | 7 Marks |
| 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.<br>$\circledast  \circledast$                        | CO1 | 7 Marks |

(An Autonomous Institution, Affiliated to JNTUA, Anantapur) **IV B.Tech II Semester (SVEC14) Supplementary Examinations June - 2021 MECHATRONICS** 

[ MECHANICAL ENGINEERING ]

**Answer One Question from each Unit** All questions carry equal marks UNIT-I Describe the role of mechatronics systems in production and CO1 14 Marks manufacturing process with an application. (**OR**) With neat sketch, explain data conversion process with the help of signal CO2 14 Marks conditioner. List out the ideal characteristics of operational amplifier. UNIT-II Distinguish between Hydraulics and Pneumatics systems. CO1 4 Marks a) What is Electro-mechanical transient performance? Derive mathematical CO2 b) 10 Marks solution for linear torque-speed characteristic. (**OR**) Write about: i) Piezoelectric actuators. CO3 5 Marks ii) DC servo motor. CO3 5 Marks iii) Stepper Motors. CO3 4 Marks UNIT-III Explain the following. CO3 9 Marks a) i) Notch filter. ii) Low pass filter. iii) Band stop filter. Discuss the functional operation of circuit breaker with schematic CO3 5 Marks b) diagram. (**OR**) Explain the working principle of transistor with a schematic diagram. CO3 6 Marks a) Discuss about Discrete Fourier Transformations (DFT) used in signal CO3 8 Marks **b**) processing. UNIT-IV) Explain the working principle of DA converter with a neat sketch. And a) CO3 9 Marks discuss the application. Recognize the factors needed for selection of a micro controller. b) CO3 5 Marks (**OR**) Demonstrate the architecture of 8051 micro controller with a neat sketch CO3 14 Marks and discuss its applications UNIT-V Design a system involving a PLC for the coin-operated barriers for a car CO4 14 Marks park. (**OR**) Explain about the working principle of PID controller with a neat CO3 10 a) 7 Marks sketch. CO1 Explain different types of Control modes. 7 Marks **b**)

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## Time: 3 hours

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Max. Marks: 70

(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)<br>b) | Explain about the Non-Ideal Effects in Switched Capacitor circuits.<br>Design a switch capacitor realization for a first order, high pass circuit<br>with a high frequency gain of -10 and a -3dB frequency of 1KHz using a<br>clock of 100KHz. | CO1<br>CO3   | 7 Marks<br>7 Marks |
|----|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------|
|    |          | (OR)                                                                                                                                                                                                                                            |              |                    |
| 2  | a)<br>b) | Sketch and explain Fully Differential Filters.<br>Discuss in detail about Biquad Filter.                                                                                                                                                        | CO1<br>CO1   | 7 Marks<br>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            |
| 4  | ``       | (OR)                                                                                                                                                                                                                                            | 001          |                    |
| 4  | a)       | Draw and explain the circuit of simple charge pump PLL and write<br>about the linear model of simple charge pump PLI                                                                                                                            | COI          | / 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<br>and having a SNR of 35 dB. How many bits of resolution does the<br>quantizer require to ensure that the quantization noise is at least 3dB                          | CO3          | 7 Marks            |
|    |          | smaller than the input noise?                                                                                                                                                                                                                   |              |                    |
| ~  |          | (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            |
| 7  | a)       | Sketch the flow graph for the Successive-Approximation approach and                                                                                                                                                                             | CO3          | 7 Marks            |
| /  | a)       | explain the conversion process.                                                                                                                                                                                                                 | CO3          |                    |
|    | b)       | Explain the operation of integrating Converters for three different input voltages                                                                                                                                                              | 003          | / 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                                                                                                                                                                                    | CO4          | 7 Marks            |
|    |          | capacitance of 12C at $V^1$ node. Investigate the node voltage at $V^1$ for an                                                                                                                                                                  |              |                    |
|    |          | input voltage $V_{in} = 1.5V$ and $V_{ref} = 5V$ .                                                                                                                                                                                              |              |                    |
|    |          | 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)                                                                                                                                                                                                                                            | <b>a a a</b> |                    |
| 10 | a)       | List and explain different architectures for higher order modulators.                                                                                                                                                                           | CO2          | 7 Marks            |
|    | D)       | Classify and compare delta sigma modulators with multibit quantizes.                                                                                                                                                                            | CO2          | / Marks            |

### 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]

Max. Marks: 70

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

## UNIT-I

| 1  | a)<br>b) | What is management? Explain the functions of management in detail.<br>Discuss the principles of scientific management.                           |                                |                                 |                        |                          |                   |                  |      |     | CO1<br>CO1 | 7 Marks<br>7 Marks |
|----|----------|--------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------------------------------|------------------------|--------------------------|-------------------|------------------|------|-----|------------|--------------------|
| 2  | a)<br>b) | Explain the steps in corporate planning process.<br>What is social responsibility? Explain the areas of social responsibility of business.       |                                |                                 |                        |                          |                   |                  |      |     |            | 7 Marks<br>7 Marks |
| 3  | a)<br>b) | What are the steps in quality control programme?<br>What is material management? Discuss the objectives of material management.                  |                                |                                 |                        |                          |                   |                  |      |     | CO1<br>CO2 | 7 Marks<br>7 Marks |
| 4  | a)<br>b) | (OR)<br>Define Plant Layout. Compare process and product layouts.<br>What are the types of inventory? Explain their importance.                  |                                |                                 |                        |                          |                   |                  |      |     | CO1<br>CO1 | 7 Marks<br>7 Marks |
| 5  | a)<br>b) | Write about role of HR manager in an organization.<br>What is job evaluation? Explain it briefly.                                                |                                |                                 |                        |                          |                   |                  |      |     | CO1<br>CO1 | 7 Marks<br>7 Marks |
| 6  | a)<br>b) | Describe the importance of Human Resource Management (HRM).<br>Explain about McGregor's theory X and theory Y.                                   |                                |                                 |                        |                          |                   |                  |      |     | CO1<br>CO1 | 7 Marks<br>7 Marks |
| 7  | a)<br>b) | Define Entreprener<br>Explain the role of                                                                                                        | ur. Ho<br>Entrej               | w they<br>preneur               | are hel                | pful to<br>econo<br>(OR) | the soo<br>mic de | ciety?<br>velopm | ent. |     | CO4<br>CO4 | 7 Marks<br>7 Marks |
| 8  |          | The data given bel                                                                                                                               | ow is a                        | bout a                          | project                | t and it                 | s activi          | ties:            |      |     | 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<br>Time 6                                                                                                                               | 8                              | 7                               | 12                     | 3                        | 5                 | 7                | 11   | 10  |            |                    |
|    |          | <ul><li>i) Draw th</li><li>ii) Mark th</li><li>iii) Find tot</li></ul>                                                                           | e proje<br>e critic<br>al proj | ect netv<br>cal path<br>ect dur | vork.<br>1.<br>ration. |                          |                   |                  |      |     |            |                    |
|    |          |                                                                                                                                                  |                                |                                 | ( U                    | INIT-                    | <b>V</b> )        |                  |      |     |            |                    |
| 9  | a)<br>b) | Discuss in detail about Total Quality Management (TQM).<br>What is Enterprise Resource Planning (ERP)? Explain it briefly.                       |                                |                                 |                        |                          |                   |                  |      |     | CO3<br>CO5 | 7 Marks<br>7 Marks |
| 10 | a)<br>b) | $(OR)$ Write short notes on Business Process Outsourcing (BPO). Explain the role of IT in managerial decision making. $\circledast  \circledast$ |                                |                                 |                        |                          |                   |                  |      |     | CO3<br>CO5 | 7 Marks<br>7 Marks |

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

# PRESTRESSED CONCRETE

[ Civil Engineering ]

Time: 3 hours

Max. Marks: 70

7 Marks

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

## UNIT-I

- Explain various losses of prestress in pre-tensioning and post-tensioning. CO1 14 Marks (OR)
   Explain about materials used for prestressed concrete. CO1 14 Marks
   Marks
   A concrete beam of cross section 250 x 500mm spanning over 8m .The CO2 14 Marks beam is prestressed by a straight cable with an eccentricity of 100mm
- 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<sup>2</sup>. 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  $24 \text{ KN/m}^3$ 

#### (OR)

- 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 CO2 eccentricity to balance a total load of 50kN/m on the beam.

## UNIT-III)

5 A double T section having a flange 1200mm wide and 150mm thick is CO3 14 Marks prestressed by 4700mm<sup>2</sup> 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<sup>2</sup> and tensile strength of steel is 1600N/mm<sup>2</sup>, determine the flexural strength of the double T girder using IS 1343 provisions.

### (OR)

6 The support section of a prestressed concrete beam, 100mm wide and CO2 14 Marks 300mm deep is required to support an ultimate shear force of 80KN. The compressive prestresss at the centrodial axis is 5N/mm<sup>2</sup>. The characteristic cube strength of concrete is 40N/mm<sup>2</sup>. The cover to the tension reinforcement is 50mm. If the characteristic tensile strength of steel in 220N/mm<sup>2</sup>, design shear reinforcement at the section.

## (UNIT-IV)

7 Explain Guyon's method to calculate bursting tension in case of evenly CO1 14 Marks distributed forces and in case of forces not evenly distributed.

#### (OR)

8 Write a note on anchorage zone reinforcement with neat figures. CO1 14 Marks

1

## UNIT-V

Determine the short term deflection and maximum deflection arising in CO2 9 14 Marks pre-stressed concrete beam for the following data. span = 15m, Cross section area =  $300 \times 600$ mm Area of steel =  $600 \text{mm}^2$ Stress = 100Mpa Density of concrete = 24kN/m<sup>3</sup>. Elastic modulus of composite = 42 Gpa. (**OR**) 10 Explain short term deflections of uncracked members. CO1 14 Marks (A)

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(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

## 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.

### (OR)

- 2 a) Define Estimating and list out the methods of estimating.
  - b) Estimate the quantities of the building from the given plan and section as CO2 10 Marks shown in figure.
    - i) Stone masonry for substructure.
    - ii) Outside plastering in CM (1: 5) with 20 mm thickness.



UNIT-II

- 3 a) How can the number of main bars and distribution bars in slabs be found CO2 3 Marks out? Mention the formula.
  - b) Prepare a detailed estimate for supplying and laying 175mm dia glazed CO2 11 Marks 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)

### (OR)

4 Prepare a detailed estimate for supplying, laying and jointing 200mm CO1 14 Marks diameter glazed stone ware pipe line jointing with 1:2 cement mortar. Measurement of trench is 120m x 0.6m x 0.6m.

## UNIT-III

| 5 | Write the detailed specifications for the following items. |                 |  | 14 Marks |
|---|------------------------------------------------------------|-----------------|--|----------|
|   | i) Mosaic flooring.                                        | ii) Plastering. |  |          |

iii) RCC work in detail.

## (OR)

- 6 a) What is the purpose and method of writing specification? Describe briefly CO1 7 Marks general and detailed specification.
  - b) Write detail specification of RCC (1:2:4) for beam concrete and painting CO1 7 Marks for walls.

7 Marks

4 Marks

Max. Marks: 70

CO1

(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 | CO3 | 7 Marks  |
|    |    | Department of Higher Education.                                             |     |          |
|    | 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 |
|    |    |                                                                             |     |          |

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### 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 Discuss the technical advantages of DC over AC transmission. CO1 7 Marks 1 a) What are the types of HVDC links? Explain. b) CO1 7 Marks (OR)With neat sketches, explain the different kinds of DC links available. 2 CO1 7 Marks a) Explain the effect of overlap angle on the performance of converter b) CO1 7 Marks circuit. Explain the combined characteristics of rectifier and inverter. UNIT-II Explain the process of starting and stopping of a DC link in HVDC 3 a) CO1 7 Marks system. Explain in detail the convertor control characteristics of HVDC systems. 7 Marks CO<sub>2</sub> **b**) (**OR**) Explain the hierarchical control structure of a DC link with the help of a CO2 7 Marks 4 a) block diagram. Discuss the current and extinction angle control. b) CO4 7 Marks UNIT-III) 5 What are the causes of reactive power deficit in power systems? a) CO1 7 Marks Explain. Explain the power flow in AC transmission with meshed connections. CO1 7 Marks b) (**OR**) 6 Explain the basic types of FACTS controllers and their relative CO2, 14 Marks importance. CO3 UNIT-IV 7 Explain the methods of controllable VAR generation. CO3 14 Marks (**OR**) 8 Explain the control scheme of STATCOM. CO<sub>2</sub> 7 Marks a) Explain the operation of TCSC. CO2 7 Marks **b**) UNIT-V 9 Differentiate between UPFC and IPFC. CO2 7 Marks a) Explain how UPFC is different from VSC. CO2 7 Marks b) (OR)Explain basic operating principle and control structure of a UPFC. 10 a) CO1 7 Marks Explain the role of IPFC in real and reactive power flow control. b) CO2 7 Marks

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# MECHATRONICS

|      |          | [ Mechanical Engineering ]                                                                                                                                                       |                   |                               |
|------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------------------|
| Time | : 3 ho   | urs<br>Answer One Question from each Unit<br>All questions carry equal marks                                                                                                     | Max.              | Marks: 70                     |
|      |          |                                                                                                                                                                                  |                   |                               |
| 1    | a)<br>b) | Identify and explain the areas where Mechatronics system can be used.<br>Explain the advantages and disadvantages of the Mechatronics system.<br>(OR)                            | CO1<br>CO1        | 7 Marks<br>7 Marks            |
| 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                       |
| 3    | a)<br>b) | Distinguish between Hydraulics and Pneumatics systems.<br>What is Electro-mechanical transient performance? Derive mathematical solution for linear torque-speed characteristic. | CO1<br>CO2        | 4 Marks<br>10 Marks           |
| 4    |          | Write about:<br>i) Piezoelectric actuators.<br>ii) DC servo motor.<br>iii) Stepper Motors.                                                                                       | CO3<br>CO3<br>CO3 | 5 Marks<br>5 Marks<br>4 Marks |
| 5    |          | Write about the following filters and draw the characteristics along with their working<br>i) Band filters. ii) Band stop.                                                       | CO3               | 14 Marks                      |
| 6    |          | Write about the following filters and draw the characteristics along with<br>the working<br>i) Low pass filters. ii) High pass filters. iii) Notch filter.                       | CO3               | 14 Marks                      |
| 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                       |
| 8    | a)<br>b) | List any two applications with examples how microcontrollers are used.<br>Identify the factors needed to selecting a microcontroller.                                            | CO3<br>CO1        | 7 Marks<br>7 Marks            |
| 9    | a)       | Develop the following ladder diagrams<br>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)<br>b) | Discuss the selection criteria of PLC.<br>Explain the basic structure of PLC with a neat sketch.                                                                                 | CO4<br>CO4        | 6 Marks<br>8 Marks            |

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

## CELLULAR AND MOBILE COMMUNICATIONS

[ Electronics and Communication Engineering ]

| Time | : 3 ho   | urs                                                                                                                                                     | Max.       | Marks: 70          |
|------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|
|      |          | <b>Answer One Question from each Unit</b>                                                                                                               |            |                    |
|      |          | All questions carry equal marks                                                                                                                         |            |                    |
|      |          | UNIT-I                                                                                                                                                  |            |                    |
| 1    | a)<br>b) | Explain the performance criteria of a cellular system.<br>List the Analog and Digital cellular systems.                                                 | CO1<br>CO1 | 7 Marks<br>7 Marks |
| 2    | a)       | (OR)                                                                                                                                                    | $CO^{2}$   | 7 Marks            |
| 2    | b)       | Explain the consideration of components of cellular systems.                                                                                            | CO1        | 7 Marks            |
|      |          | UNIT-II)                                                                                                                                                |            |                    |
| 3    | a)<br>b) | Explain the method for finding the antenna height gain.<br>What are the effects of cell site antennas?                                                  | CO2<br>CO2 | 7 Marks<br>7 Marks |
| 4    | a)<br>b) | Derive the transfer function of propagation channel.<br>What are the characteristics of antenna structures?                                             | CO2<br>CO2 | 7 Marks<br>7 Marks |
|      |          | UNIT-III)                                                                                                                                               |            |                    |
| 5    | a)<br>b) | How interference is avoided in numbering and grouping the channels?<br>Compare the performance of Omni cell and sectorized cells.                       | CO1<br>CO2 | 7 Marks<br>7 Marks |
| 6    | a)<br>b) | Why handoffs are necessary and describe its types?<br>What is a dropped call and how are these evaluated?                                               | CO2<br>CO2 | 7 Marks<br>7 Marks |
|      |          | UNIT-IV)                                                                                                                                                |            |                    |
| 7    | a)<br>b) | Explain the effect of large PAPR on the features of OFDM system.<br>Explain two coding techniques used in cellular systems.                             | CO1<br>CO1 | 7 Marks<br>7 Marks |
| 8    | a)       | Explain about QPSK modulation technique along with constellation diagram Why QQPSK is preferred over QPSK?                                              | CO1        | 7 Marks            |
|      | b)       | What are the advantages of Orthogonal Frequency Division<br>Multiplexing for digital transmissions over channel subject to fading?                      | CO2        | 7 Marks            |
|      |          | UNIT-V                                                                                                                                                  |            |                    |
| 9    | a)<br>b) | Sketch forward control channel block diagrams for IS-95.<br>Compare TDMA and CDMA schemes, identifying the advantages of<br>each scheme over the other. | CO1<br>CO1 | 7 Marks<br>7 Marks |
| 10   | - )      | (OR)                                                                                                                                                    | 001        | 7 1 1              |
| 10   | a)       | handoff provide a performance improvement in CDMA systems?                                                                                              | COI        | / Marks            |
|      | b)       | Provide a diagram showing how a call is set up in IS-136. Explain.                                                                                      | CO2        | 7 Marks            |
|      |          | \$P & \$P                                                                                                                                               |            |                    |

(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

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

Max. Marks: 70

## 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             |
| 2 | a)       | ( <b>OR</b> )<br>What are the Kepler's three laws of planetary motion? Give the                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | CO1        | 7 Marks             |
| - | u)       | mathematical formulation of Kepler's third law of planetary motion.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 001        | / 10 <b>10</b> 1110 |
|   | b)       | <ul> <li>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 <ol> <li>The velocity of the satellite in orbit.</li> <li>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.</li> <li>Hence, find the Doppler shift of the received signal at the earth station. Use a mean earth radius value, re, of 6378 km.</li> </ol> </li> </ul> | 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             |
| 4 | `        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 002        |                     |
| 4 | a)       | 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.                                                                                                                                                                                                                                                                                                                                                                                                                | 03         | 6 Marks             |
|   | b)       | Explain in brief telemetry, tracking and command of the satellite system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | CO1        | 8 Marks             |
|   |          | (UNIT-TIT)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |                     |
| 5 | a)       | Explain in detail about TDMA Frame Structure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | CO1        | 7 Marks             |
| C | b)       | Describe FDMA structure with a neat block diagram and explain advantages of FDMA over TDMA.                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | CO4        | 7 Marks             |
| 6 | a)       | (OR)<br>With the help of a next diagram explain Frequency Hop Spread Spectrum                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | CO1        | 7 Marks             |
| 0 | a)<br>b) | Design Cassegrain antenna to transmit 5KW power at 6 GHz with gain of 84dB. Choose the diameter as 10m and calculate the efficiency.                                                                                                                                                                                                                                                                                                                                                                                                                         | CO1<br>CO2 | 7 Marks<br>7 Marks  |
|   |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |                     |

## UNIT-IV

7 a) Analyze and discuss the Delay and Throughput considerations in a CO2 7 Marks satellite system.

b) Summarize the advantages and disadvantages of low and medium earth CO1 7 Marks orbits.

### (OR)

8

a) Compare geostationary and geosynchronous satellites.
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.
CO1 7 Marks 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:                                                         | CO1 | 7 Marks |
|    |    | i) GPS Navigation Message ii) GPS Signal Levels                                      |     |         |
|    | b) | Explain GPS Receivers and Codes with suitable sketches.                              | CO4 | 7 Marks |

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 ]

Max. Marks: 70

Time: 3 hours

### 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.<br>(OR)                                   | CO1 | 14 Marks |
| 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  |
| 8  | a) | Define an expression and explain different expressions supported by Pig                        | CO1 | 7 Marks  |
| 0  | 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 |
|    |    |                                                                                                |     |          |

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Time: 3 hours

### 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 ]

Max. Marks: 70

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

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| 1  | a)<br>b)   | Distinguish between passive attacks an active attacks.<br>Discuss about various security services.           | CO1<br>CO1 | 7 Marks<br>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 $q=11$ and a primitive root $n = 2$ . | CO2        | 14 Marks           |
|    |            | 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?                    |            |                    |
|    |            | (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            |
|    | ,          |                                                                                                              |            |                    |
| 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                                     | CO2        | 8 Marks            |
|    | -)         | VeriSign.                                                                                                    |            |                    |
|    |            | (OR)                                                                                                         |            |                    |
| 8  | a)         | Briefly discuss about the format of an Encapsulating Security Payload                                        | CO1        | 7 Marks            |
|    | <b>b</b> ) | packet.                                                                                                      | CON        | 7 Martra           |
|    | D)         | Discuss about features and components of Secure Electronics Transaction.                                     | 002        | / 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-                                       | CO2        | 7 Marks            |
|    |            | Dascu muusion delection?                                                                                     |            |                    |

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(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

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

### **INFORMATION RETRIEVAL SYTEMS**

[ Computer Science and Engineering ]

Max. Marks: 70

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

## UNIT-I )

- Define an Information Retrieval System. Describe the functional overview CO1 1 9 Marks a) of Information Retrieval Systems. Show the variations in Precision and Recall with a graph while retrieving b) CO<sub>2</sub> 5 Marks relevant and non-relevant items (**OR**) Describe the types of data structures used in Information Retrieval System CO1 2 7 Marks a) and explain Inverted File data structure. What is a Latent Semantic Indexing (LSI)? How to perform Single Value CO1 b) 7 Marks Decomposition using matrix. UNIT-II) Compare advantages and disadvantages of porter Stemming algorithm, 3 CO2 7 Marks a) Dictionary Stemming algorithm and Success Variety stemming algorithm. What is Indexing? Explain Manual Indexing process. b) CO1 7 Marks (**OR**) 4 Write short notes on: CO1 7 Marks a) i) Categorization. ii) CitationMetadata. Briefly discuss the automatic Indexing of multimedia items. 7 Marks b) CO1 (UNIT-III) Distinguish term clustering and item clustering. Explain with suitable 5 a) CO1 7 Marks examples What is the need of Thesaurus in a document and how it can be generated? CO2 7 Marks **b**) (**OR**) Why is relevance feedback required in User Search Techniques? Explain. CO1 8 Marks 6 a) b) Describe briefly why Search Statements and Binding are required. CO2 6 Marks (UNIT-IV) What is information visualization? Discuss the different areas of CO1 7 7 Marks a) information visualization and presentation. Explain in detail aspects of the visualization process. CO1 7 Marks b) (**OR**) Explain multimedia item presentation. CO1 7 Marks 8 a) Briefly discuss any two presentations of hits. CO1 7 Marks b) UNIT-V 9 Discuss about Hardware Text Search system with a block diagram. 7 Marks a) CO1 Sketch and discuss the GOOGLE Scalable Multiprocessor Architecture. CO1 7 Marks **b**) (**OR**) Explain Information System and Measures Used in System Evaluations. 10 CO1 14 Marks
  - \$P (P (P)
    - 1

Time: 3 hours

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 | e: 3 ho | urs                                                                                                                                                                                                                                         | 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   |
| 2.   | a)      | Explain the load characteristics of Shunt, Series and Compound motors                                                                                                                                                                       | CO6  | 7 Marks   |
|      | b)      | Explain various methods to control the speed of DC shunt motor.                                                                                                                                                                             | CO5  | 7 Marks   |
| 2    | 2)      | UNIT-II                                                                                                                                                                                                                                     | CO2  | 7 Marilar |
| 3.   | a)      | 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.                                                    | 02   | / Marks   |
|      | b)      | Develop the equivalent circuit of a single phase transformer.<br>(OR)                                                                                                                                                                       | CO2  | 7 Marks   |
| 4.   | a)      | Draw the equivalent circuit of a transformer and show how the constants<br>of primary and secondary windings may be combined to give a simplified<br>equivalent circuit with the values of constants given in terms of secondary<br>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   |
| 5.   | a)      | A three phase balanced delta connected load of $(5+j8)\Omega$ per phase is<br>connected 400V. Calculate the i) phase currents ii) line currents iii) total<br>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 $(4+j3)\Omega$ per phase is connected to<br>balanced three phase supply. The phase current is 12 A. Find active power,<br>reactive power and apparent power.                                              | CO2  | 6 Marks   |
|      | c)      | A balanced delta connected load of $(4+j8)\Omega$ per phase is connected 400 V balanced three phase supply. Determine phase and line currents.                                                                                              | CO2  | 4 Marks   |
| 7.   | a)      | Explain how a rotating magnetic field is produced in a three phase induction mater with the help of a past 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                                                                                           | CO2  | 4 Marks   |

rotor frequency.

(**OR**)

- 8. a) Derive the condition for maximum running torque of three phase induction CO1 7 Marks motor.
  - b) A 4-pole, three phase induction motor operates from a supply whose CO2 7 Marks 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.

## 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 CO1 7 Marks its applications.

### (OR)

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

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Time: 3 hours

## 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]

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  |
| 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. | CO4        | 10 Marks |
|     |    | $F(A, B, C, D, E) = \sum m (1, 4, 6, 10, 20, 22, 24, 26).$                                          |            |          |
|     | b) | Reduce the following function using K-map.<br>$F(A, B, C, D, E) = \sum m (1, 4, 6, 10).$            | CO5        | 4 Marks  |
|     |    | (OR)                                                                                                |            |          |
| 4.  | a) | Reduce the following function using K-map<br>$F(A, B, C, D) = \Pi M(0, 2, 3, 8, 9, 12, 13, 15).$    | CO5        | 7 Marks  |
|     | b) | Obtain the simplified expression in sum of products                                                 | CO4        | 7 Marks  |
|     |    | $F(A, B, C, D) = \Sigma m(1, 2, 4, 11, 12, 13) + d(0, 3, 6, 10).$                                   |            |          |
| _   |    | 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  |
| 6   | a) | Explain 1-line to 4-line de-multiplexer with an example                                             | CO1        | 7 Marks  |
| 0.  | b) | Implement the function with a MUX: $F(A, B, C) = \Sigma m(1, 3, 5, 6)$ .                            | CO1<br>CO2 | 7 Marks  |
|     | ,  |                                                                                                     |            |          |
| 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                             | CO6        | 7 Marks  |
|     |    | 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?           |            |          |
|     | 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.                                                | CO2        | 7 Marks  |
|     |    | $W(A,B,C,D) = \Sigma m(0,2,6,7,8,9,12,13),$                                                         |            |          |
|     |    | $X(A,B,C,D)=\Sigma m(0,2,6,7,8,9,12,13,14).$                                                        |            |          |
| 10  |    | (OR)                                                                                                | 001        | 7 ) ( 1  |
| 10. | a) | Distinguish between Moore and Mealy machine.                                                        | COL        | / Marks  |
|     | D) | binary number and generates its equivalent Excess-3 code.                                           | 006        | / Marks  |

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## 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 ho | urs                                                                                                      | Max. Marks: 70 |           |
|      |        | Answer One Question from each Unit<br>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   |
| r    | 2)     | (UK)                                                                                                     | CO(            | 10 Martra |
| Ζ.   | a)     | Explain with an example.                                                                                 | C00            |           |
|      | b)     | UNIT-II                                                                                                  | COI            | 4 Marks   |
| 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                                          | CO3            | 14 Marks  |
|      |        | Development:                                                                                             |                |           |
|      |        | i) Construction Phase.<br><b>UNIT-III</b>                                                                |                |           |
| 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   |
| 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   |
|      |        |                                                                                                          |                |           |
| 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<br>Estimating Process             | CO3            | 7 Marks   |
|      |        |                                                                                                          |                |           |
| 0    | ``     |                                                                                                          | 001            | - > < 1   |
| 9.   | a)     | Discuss the Seven core metrics for the Software Project with an example.                                 | COI            | 7 Marks   |
|      | D)     | (OR)                                                                                                     | 002            | / Marks   |
| 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   |
|      |        |                                                                                                          |                |           |

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. Show with a diagram, the steps involved in a mobile terminated call CO1 7 Marks a) (a station calling a mobile station) in GSM. What are the software layers and components needed in mobile computing b) CO1 7 Marks devices? (**OR**) 2. a) Name the main elements of the GSM system architecture and describe CO1 7 Marks their functions. List the peak data transfer rates for LTE. Explain its functioning. CO5 7 Marks b) UNIT-II 3. Perceive the problem of hidden and exposed terminals. Determine what CO1 7 Marks a) happens in the case of such terminals if Aloha, slotted Aloha, reservation Aloha or MACA is used. Summarize the benefits of reservation schemes. How are collisions CO1 7 Marks b) avoided during data transmission, why is the probability of collisions lower in reservation schemes compared to classical Aloha? (**OR**) Compare IEEE 802.11 and Bluetooth with regard to their ad-hoc 4. a) CO1 7 Marks capabilities. If Bluetooth is a commercial success, what are remaining reasons for the CO4 7 Marks b) use of infrared transmission for WLANs? Justify. (UNIT-III) Explain packet flow, if two mobile nodes communicate and both are in 5. a) CO5 7 Marks foreign networks. What additional routes do packets take if reverse tunneling is required? What is the role of reverse tunneling in route optimization? Explain. CO5 7 Marks b) (**OR**) How and why does I-TCP isolate problems on the wireless link? What are 6. CO1 7 Marks a) the main drawbacks of this solution? Discuss the TCP characteristics to be considered when developing CO1 7 Marks b) applications over 2.5/3G wireless networks (UNIT-IV) 7. Illustrate the situations in which a database can crash. Explain how does CO2 8 Marks a) database recovery can be done using a recovery manager. Define power aware computing. Enlist the power aware computing CO2 6 Marks b) techniques. (**OR**) Compare and contrast Push Data delivery and Pull Data delivery 8. CO2 8 Marks a) mechanisms. Explain the functions of Hybrid mechanisms with a neat sketch. 6 Marks b) CO2

## UNIT-V

9. a) Discuss the challenges and issues in implementing MANETs. CO3

b) Apply DSR Routing Algorithm for the following network to find the CO3 9 Marks shortest path from Node-S to Node-N.

5 Marks



(OR)

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



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 ) Write about the structure of C program with suitable example. 1. 6 Marks a) Sketch the block diagram to create and run the C program in Turbo C. b) 6 Marks (OR)2 Label any two major components of a computer system. a) 6 Marks Identify the steps in creating and running a C program. 6 Marks b) UNIT-II) What is two-dimensional array? How they are stored in memory? 3. a) 6 Marks Explain Memory Allocation Functions with suitable example. 6 Marks b) (OR)Write a C Program to swap two elements without using third variable. 4. 6 Marks a) Differentiate "if" statement and "if - else" statement with an example program. 6 Marks b) (UNIT-III) State which value is automatically assigned to those array elements that are not 5. 5 Marks a) explicitly initialized with an example. State various types of functions used in C. b) 7 Marks (OR) Formulate n<sup>th</sup> Fibonacci number generation using recursion. 6 Marks 6. a) Define function and explain about system defined functions with suitable 6 Marks b) example. UNIT-IV) Argue about Enumerated types in C with an example for creating Colors type. 7. 3 Marks a) Explain about nested structure with an example. 4 Marks b) Differentiate structures and Unions in C. 5 Marks c) (OR)8. How to declare structure and its variables? Specify accessing operators for 12 Marks structures. UNIT-V Relate conditional Preprocess directives with suitable example. 9. a) 7 Marks Specify various access modes for text files. 5 Marks b) (OR)Write a C program to demonstrate sequential file access. 10. 12 Marks (A) <del>(</del>@} <del>(</del> \_

SVEC16

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M.C.A. I Semester (SVEC-19) Supplementary Examinations August - 2021

## **COMPUTER ORGANIZATION**

| ]   | Fime: 3 | 3 hours                                                                                                                         |          | Max. | Marks: 6 | 50                       |
|-----|---------|---------------------------------------------------------------------------------------------------------------------------------|----------|------|----------|--------------------------|
|     |         | Answer One Question from each Unit<br>All questions carry equal marks                                                           |          |      |          |                          |
| 1.  | a)      | Draw and explain the block diagram of a digital computer.                                                                       | 6 Marks  | L2   | CO1      | PO1                      |
|     | b)      | Give a brief note on the following:<br>i) Computer Organization.<br>ii) Computer Architecture.<br>ii) Computer Design.          | 6 Marks  | L1   | CO2      | PO3<br>PO1<br>PO2        |
| 2.  |         | (OR)<br>Construct Binary Counter with Parallel Load and explain.                                                                | 12 Marks | L3   | CO2      | PO1<br>PO2<br>PO3        |
| 3.  |         | <b>UNIT-II</b><br>Discuss in detail the fixed-point representation with a suitable example.                                     | 12 Marks | L1   | CO1      | PO1<br>PO2               |
| 4.  |         | (OR)<br>Relate different codes of digital computers with examples.                                                              | 12 Marks | L1   | CO1      | PO1<br>PO2               |
| 5.  |         | Explain the computer hardware configuration of micro-programmed control unit with a diagram.                                    | 12 Marks | L2   | CO1      | PO1<br>PO2<br>PO3        |
| 6.  | a)      | (OR)<br>Define the fields that we can found in the instruction format.<br>Explain different instruction formats in detail.      | 6 Marks  | L1   | CO1      | PO1<br>PO2               |
|     | b)      | Illustrate the importance of interrupt in the execution of a program.                                                           | 6 Marks  | L2   | CO2      | PO1<br>PO2<br>PO5        |
| 7.  |         | Design the flowchart for interrupt cycle and explain.                                                                           | 12 Marks | L3   | CO2      | PO1<br>PO2<br>PO3        |
| 8.  | a)      | ( <b>OR</b> )<br>Classify memory reference instructions.                                                                        | 6 Marks  | L4   | CO1      | PO1                      |
|     | b)      | Explain briefly about the design of basic computer.                                                                             | 6 Marks  | L2   | CO2      | PO2<br>PO2<br>PO3        |
| 9.  |         | <b>UNIT-V</b><br>Evaluate Input-Output-Processor (IOP) organization.                                                            | 12 Marks | L4   | CO2      | PO1<br>PO2<br>PO5        |
| 10. |         | (OR)<br>Define cache memory. Explain different mapping procedures in<br>the organization of cache memory with suitable example. | 12 Marks | L2   | CO2      | PO1<br>PO2<br>PO3<br>PO5 |

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M.C.A. I Semester (SVEC-19) Supplementary Examinations August - 2021

## **OPERATING SYSTEMS**

Time: 3 hours Max. Marks: 60 **Answer One Ouestion from each Unit** All questions carry equal marks UNIT-I 1. Determine the problems in design and implementation of 12 Marks L2 CO1 PO1 Operating Systems. **PO2** (OR) What is context switching? Categorize types of schedulers in 2. 12 Marks L1 CO<sub>2</sub> PO1 Process Management. Explicate in detail about representation of process scheduling using Queuing diagram. UNIT-II Identify various thread issues in multithreaded programming. 3. a) 6 Marks L1 CO1 **PO1** PO4 Specify the role of the dispatcher. Describe Multiple-Processor 6 Marks L1 CO<sub>2</sub> PO1 b) Scheduling and its approaches. **PO4** (**OR**) Distinguish between multilevel Queue and multilevel feedback L3 4. 12 Marks CO<sub>2</sub> PO<sub>2</sub> queue scheduling algorithms. PO4 UNIT-III) 5. Identify the requirements to be satisfied for a solution to the 6 Marks L1 CO3 PO1 a) critical section problem. **PO2** What are the methods for handling deadlocks? b) 6 Marks L2 CO2 PO1 PO<sub>3</sub> (**OR**) L3 CO3 **PO2** 6. a) How to handle dining philosophers problem using 6 Marks synchronization tool? PO4 Illustrate Banker's algorithm to avoid deadlock. 6 Marks L2 CO2 PO1 b) **PO2** UNIT-IV 7. Elucidate Hierarchical paging and Inverted page Tables for 12 Marks L2 CO4 PO1 structuring the page table. (**OR**) Calculate number of page faults for the following page reference 12 Marks L3 8. CO4 PO1 String using optimal replacement algorithm with three frames PO<sub>2</sub> allocated in memory: PO5 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1 UNIT-V L2 PO1 9. a) What are the principles of protection? 5 Marks CO5 **PO2** Elucidate the following methods for implementing the access 7 Marks L3 CO5 PO1 b) matrix: PO<sub>3</sub> ii) Access Lists for objects. i) Global Table. (**OR**) 10. Elucidate in detail about Revocation of Access Rights and 12 Marks L1 CO5 **PO1** Domain structure.

> (P) (P) (A)

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## M.C.A. I Semester (SVEC-20) Regular Examinations August – 2021

## COMPUTER ORIENTED STATISTICAL TECHNIQUES

| Т  | ime: 3    | hours                    | An          | swer ()    | ne Ou           | estion fi       | om ea          | ch Unit    |            | Max. | Marks:   | 60   |
|----|-----------|--------------------------|-------------|------------|-----------------|-----------------|----------------|------------|------------|------|----------|------|
|    |           |                          |             | All que    | stions          | carry e         | qual m         | arks       |            |      |          |      |
|    |           |                          |             |            |                 | NIT-I           | $\supset$      |            |            |      |          |      |
| 1. | a)        | Calculate Mean an        | nd Media    | n from t   | he follo        | wing da         | nta:           |            | 6 Marks    | L4   | CO1      | PO2  |
|    |           | Class Interval           | 20-30       | 30-40      | ) 40-           | 50 50           | -60            | 60-70      |            |      |          |      |
|    |           | Frequency                | 3           | 5          | 20              | ) 1             | 0              | 5          |            |      |          |      |
|    | b)        | Find the Geometri        | ic Mean f   | rom the    | follow          | ring data       | 1:             |            | 6 Marks    | L3   | CO1      | PO2  |
|    |           | Class Interval           | 4-8         | 8-12       | 12-10           | 6 16-2          | 20 2           | 0-24       |            |      |          |      |
|    |           | Frequency                | 2           | 4          |                 | $(\mathbf{OR})$ |                | 3          |            |      |          |      |
| 2. | a)        | Find the Karl Pear       | rson's co   | -efficier  | nt of ske       | ewness 1        | to the f       | following  | 6 Marks    | L3   | CO1      | PO2  |
|    | data:     |                          |             |            |                 |                 |                |            |            |      |          |      |
|    |           | Class Interval           | 0-2 2-4     | 4-6        | 6-8             | 8-10            | 10-12          | 12-14      |            |      |          |      |
|    | 1 \       | Frequency                | 6 8         | 17         | $\frac{21}{CN}$ | 15              |                |            |            | 1.2  | 001      | DO 1 |
|    | b)        | Derive Central Mo        | oments in   | terms o    | of Non-         | central I       | Nomer          | nts.       | 6 Marks    | L2   | COI      | POI  |
|    |           |                          |             |            |                 | NIT-II          | $\supset$      |            |            |      |          |      |
| 3. |           | Illustrate the operation | ations of l | ists in R  | R with e        | xample          | for ea         | ch.        | 12 Marks   | L3   | CO3      | PO1  |
| 4  |           | Discuss in detail a      | bout mat    | rices in l | R               | (OR)            |                |            | 12 Marks   | L1   | CO3      | PO1  |
|    |           | Discuss in detail a      | loout mut   |            |                 |                 |                |            | 12 WILLING | LI   | 005      | 101  |
| 5. | a)        | Show that Binomi         | al distrib  | ution ter  | nds to F        | oisson          | distrib        | ution as a | 6 Marks    | L3   | CO2      | PO2  |
|    | b)        | Fit a Poisson distr      | ibution to  | the foll   | owing           | data:           |                |            | 6 Marks    | L4   | CO3      | PO4  |
|    |           |                          | x 0         | 1          | 2 3             | 4               |                |            |            |      |          |      |
|    |           |                          | f 109       | ) 65       | 22 3            | 1               |                |            |            |      |          |      |
|    |           | Also test the adequ      | uacy of m   | odel usi   | ing R.          |                 |                |            |            |      |          |      |
| 6  | a)        | One fifth perce          | nt of t     | ha hla     | dag ni          | (OR)<br>roduced | by             | a blada    | 6 Marka    | 12   | $CO^{2}$ | DOJ  |
| 0. | <i>a)</i> | manufacturing fac        | ctory turn  | out to     | be defe         | ective.         | The b          | lades are  | 0 WIAIKS   | LJ   | 002      | FO2  |
|    |           | supplied in packe        | ts of 10.   | Use Po     | oisson o        | listribut       | ion to         | calculate  |            |      |          |      |
|    |           | i) No def                | umber of    | packets    | contan          | nıng;           |                |            |            |      |          |      |
|    |           | ii) One def              | fective bla | ide in a   | consig          | nment of        | f 1000         | 0.         |            |      |          |      |
|    | b)        | The weekly wage          | es of 100   | 0 wor      | kers a          | e norm          | ally d         | istributed | 6 Marks    | L4   | CO3      | PO4  |
|    |           | around a mean of         | Rs.70 and   | l Standa   | rd Dev          | iation of       | f Rs.5.<br>ha: | Estimate   |            |      |          |      |
|    |           | i) betweer               | n Rs. 70 a  | nd Rs 7    | kiy wag<br>2.   | ges will        | ue.            |            |            |      |          |      |
|    |           |                          |             | 1 D =      | <br>• ·         | D               |                |            |            |      |          |      |

ii) between Rs. 69 and Rs.72 using R.

## UNIT-IV

7. Find the rank correlation for the following data using R and 12 Marks L4 CO3 PO2 comment on the result.

| Χ | 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 12 Marks L4 CO4 PO3 regression for the following data.

| 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 random sample of size 25 from a normal population has the 6 Marks L3 a) CO<sub>2</sub> PO2 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  $\mu = 42.5$ ? A study shows that 16 out of 200 tractors produced one assembly b) 6 Marks L3 CO<sub>2</sub> PO4 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? (**OR**) Pumpkins were grown under two experimental conditions. Two 10. a) 6 Marks L3 CO2 **PO2** 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. From the following data, find whether there is any significant 6 Marks b) L3 CO<sub>2</sub> PO4 liking in the habit of taking soft drinks among the categories of employees.

| Soft Drinks | Clerks | Teachers | Officers |
|-------------|--------|----------|----------|
| Pepsi       | 10     | 25       | 65       |
| Thumsup     | 15     | 30       | 65       |
| Fanta       | 50     | 60       | 30       |

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## M.C.A. I Semester (SVEC-20) Regular Examinations August – 2021

## **COMPUTER NETWORKS**

| Т  | ime: 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<br>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<br>Media.                                                                                                                                                                                                                                                                                                                                                                                                | 6 Marks  | L4       | CO1    | PO2 |
|    |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |          |          |        |     |
| 3  | a)     | Differentiate classical ALOHA and slotted ALOHA                                                                                                                                                                                                                                                                                                                                                                                                                      | 6 Marks  | I 4      | CO3    | PO2 |
| 5. | b)     | Illustrate the Sliding window protocol using <i>Go-Back N</i> and <i>Selective Repeat</i> techniques                                                                                                                                                                                                                                                                                                                                                                 | 6 Marks  | L4<br>L3 | CO2    | PO2 |
|    |        | (OR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |          |          |        |     |
| 4. | a)     | Suppose we want to transmit the "message 1011 0010 0111 and<br>protect it from errors using the cyclic redundancy check (CRC)<br>polynomial $x^4 + x^2 + 1$ . Use polynomial long division to determine<br>the message that should be transmitted. Suppose the leftmost bit<br>of the message is inverted due to noise on the transmission link.<br>What is the result of the 'receiver's CRC calculation? How does<br>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 |
|    |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |          |          |        |     |
| 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 |
|    |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |          |          |        |     |
| 7. |        | Differentiate the TCP header and the UDP header formats.<br>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. 6 Marks Although TCP provides a reliable service and UDP does not, L3 CO4 PO4 a) many applications fit better in the communication system by using UDP. Investigate the reasons behind UDP supporting for many applications. Define the term Silly Window Syndrome. Examine the factors b) 6 Marks L2 CO4 PO4 that cause silly window syndrome problem and how it can be avoided.

## UNIT-V

9. Analyze the addressing system used by SMTP. Explain the 12 Marks L2 CO4 PO2 Simple Mail Transfer Protocol (SMTP) protocol.

### (OR)

- 10. a) Discuss the need for name resolution. Illustrate the domain name 6 Marks L2 CO4 PO3 hierarchy and the steps in resolution.
  - b) Define MIME. Tabulate the MIME header and explain the 6 Marks L2 CO4 PO2 content types.

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M.C.A. I Semester (SVEC-20) Regular Examinations August – 2021

## **DATABASE MANAGEMENT SYSTEMS**

| Ti  | me: 3 | hours                                                                                                                                                      |          | Max. Marks: 60 |     |     |
|-----|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------------|-----|-----|
|     |       | Answer One Question from each Unit<br>All questions carry equal marks                                                                                      |          |                |     |     |
|     |       |                                                                                                                                                            |          |                |     |     |
| 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.<br>(OR)                                                                                        | 4 Marks  | L1             | CO1 | PO1 |
| 2.  |       | Explain the classification of Database Management System.                                                                                                  | 12 Marks | L2             | CO2 | PO2 |
| 3.  | a)    | Mention different attribute data types used in Structured Query Language (SOL).                                                                            | 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.  |       | <ul><li>Write SQL query language for the following commands:</li><li>i) Insert command.</li><li>ii) Delete command.</li><li>iii) Update command.</li></ul> | 12 Marks | L3             | CO4 | PO4 |
|     |       |                                                                                                                                                            |          |                |     |     |
| 7.  |       | Describe the following concepts:<br>i) Serializability.<br>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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M.C.A. I Semester (SVEC-20) Regular Examinations August – 2021

## DATA STRUCTURES AND ALGORITHMS

| Т   | ime: 3 | hours                                                                                         |             | Max. Marks: 60 |          |     |  |
|-----|--------|-----------------------------------------------------------------------------------------------|-------------|----------------|----------|-----|--|
|     |        | Answer One Question from each Unit<br>All questions carry equal marks                         |             |                |          |     |  |
|     |        |                                                                                               |             |                |          |     |  |
| 1.  | a)     | Explain best case, average case and worst case in analysis of                                 | 6 Marks     | L2             | CO1      | PO1 |  |
|     | b)     | algorithms.<br>Differentiate the following:                                                   | 6 Marks     | 14             | CO1      | PO2 |  |
|     | 0)     | i) Big-Oh and Omega notation.                                                                 | 0 101001110 | 21             | 001      | 102 |  |
|     |        | ii) Linear and non-linear data structures.                                                    |             |                |          |     |  |
| า   |        | (UK)<br>What do you mean by Sourching? Explain Sequential sourch and                          | 12 Marka    | 12             | $CO^{2}$ |     |  |
| Ζ.  |        | Binary search with help of example.                                                           | 12 Marks    | LZ             | 002      | rui |  |
| _   |        | UNIT-II                                                                                       |             |                |          |     |  |
| 3.  |        | Explain the operations of doubly linked lists with example.<br>(OR)                           | 12 Marks    | L2             | CO3      | PO1 |  |
| 4.  |        | What is a circular linked list? Design an algorithm to perform the                            | 12 Marks    | L2             | CO3      | PO3 |  |
|     |        | i) insert an element                                                                          |             |                |          |     |  |
|     |        | ii) delete an element from a circular linked list.                                            |             |                |          |     |  |
|     |        | UNIT-III)                                                                                     |             |                |          |     |  |
| 5.  |        | Explain linked list implementation of stacks with example.                                    | 12 Marks    | L2             | CO4      | PO1 |  |
| 6   |        | (OR)                                                                                          | 12 Mortes   | 12             | CO4      | DOJ |  |
| 0.  |        | suitable example?                                                                             | 12 WIAIKS   | LJ             | 004      | FU2 |  |
|     |        |                                                                                               |             |                |          |     |  |
| 7.  |        | Define the following terms with example with respect to Binary                                | 12 Marks    | L2             | CO5      | PO1 |  |
|     |        | tree:<br>i) Strictly Binary Tree                                                              |             |                |          |     |  |
|     |        | ii) Completely Binary Tree.                                                                   |             |                |          |     |  |
|     |        | iii) Binary Search Tree.                                                                      |             |                |          |     |  |
|     |        | (OR)                                                                                          |             |                | ~~ -     |     |  |
| 8.  |        | Write the steps to construct a binary tree for the given Inorder<br>and Postorder traversals: | 12 Marks    | L6             | CO5      | PO5 |  |
|     |        | Inorder : 9,3,15,20,7                                                                         |             |                |          |     |  |
|     |        | Postorder : 9,15,7,20,3                                                                       |             |                |          |     |  |
|     |        | UNIT-V                                                                                        |             |                |          |     |  |
| 9.  | a)     | What is Hashing? Explain different Hash functions used in the                                 | 6 Marks     | L3             | CO6      | PO5 |  |
|     | b)     | Explain in detail M-way search trees                                                          | 6 Marks     | L2             | CO5      | PO1 |  |
|     | 0)     | (OR)                                                                                          | 0 10101110  | 22             | 000      | 101 |  |
| 10. |        | Discuss following with reference to graphs with an example:                                   | 12 Marks    | L2             | CO5      | PO1 |  |
|     |        | i) Directed graph. ii) Undirected graph.                                                      |             |                |          |     |  |
|     |        | my Degree of ventex. Ivy Acyclic Orapii.                                                      |             |                |          |     |  |

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## SREE VIDYANIKETHAN ENGINEERING COLLEGE

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## M.C.A. I Semester (SVEC-20) Regular Examinations August – 2021

## **PYTHON PROGRAMMING**

| Ti  | me: 3    | hours                                                                                                                                                     |                    | Max.     | Marks: (   | 50         |
|-----|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------|------------|------------|
|     |          | Answer One Question from each Unit<br>All questions carry equal marks                                                                                     |                    |          |            |            |
|     |          |                                                                                                                                                           |                    |          |            |            |
| 1.  |          | Describe the features, characteristics and applications of Python.                                                                                        | 12 Marks           | L1       | CO1        | PO1        |
| 2.  | a)<br>b) | Write short note on computational problem solving.<br>Analyze the relationship between computers and algorithms.                                          | 6 Marks<br>6 Marks | L2<br>L4 | CO1<br>CO1 | PO1<br>PO1 |
|     |          |                                                                                                                                                           |                    |          |            |            |
| 3.  | a)<br>b) | How to perform iterations over list? Explain with an example.<br>Explain solution control statement in python with example.<br>(OR)                       | 6 Marks<br>6 Marks | L3<br>L2 | CO1<br>CO1 | PO1<br>PO1 |
| 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        |
|     |          |                                                                                                                                                           |                    |          |            |            |
| 5.  | a)<br>b) | List and explain string methods in python with example.<br>Explain the use of join and split method with examples. Describe<br>why strings are immutable. | 6 Marks<br>6 Marks | L1<br>L2 | CO3<br>CO3 | PO1<br>PO3 |
| 6.  | a)       | (OR)<br>Describe function in python. Explain value returning and non                                                                                      | 6 Marks            | L2       | CO4        | PO1        |
|     | b)       | Differentiate between mutable <i>vs</i> immutable arguments with sample code.                                                                             | 6 Marks            | L4       | CO2        | PO2        |
|     |          |                                                                                                                                                           |                    |          |            |            |
| 7.  | a)       | Explain the fundamental features of Object Oriented<br>Programming                                                                                        | 6 Marks            | L2       | CO3        | PO1        |
|     | b)       | What is polymorphism? Illustrate manipulation of geometric shapes in python using polymorphism.                                                           | 6 Marks            | L3       | CO3        | PO3        |
| 8.  |          | (OR)<br>Demonstrate the use of inheritance and polymorphism in python<br>with an example program.                                                         | 12 Marks           | L3       | CO4        | PO1        |
|     |          |                                                                                                                                                           |                    |          |            |            |
| 9.  | a)<br>b) | Discuss in brief about configuration of widgets.<br>Write a short note on making widgets.                                                                 | 6 Marks<br>6 Marks | L2<br>L2 | CO1<br>CO5 | PO1<br>PO3 |
| 10. | a)       | Choose the concepts of tkinter to implement Graphical user<br>Interfaces using a python program                                                           | 6 Marks            | L3       | CO5        | PO3        |
|     | b)       | Describe the structure of tkinter.                                                                                                                        | 6 Marks            | L1       | CO5        | PO3        |
|     |          | \$P \$P \$P                                                                                                                                               |                    |          |            |            |

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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**

| Ti  | me: 3 | hours                                                                                                                                                                                                                   |          | Max. | Marks: (   | 50  |
|-----|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------|------------|-----|
|     |       | Answer One Question from each Unit                                                                                                                                                                                      |          |      |            |     |
|     |       | All questions carry equal marks                                                                                                                                                                                         |          |      |            |     |
|     |       |                                                                                                                                                                                                                         |          |      |            |     |
| 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.<br>(OR)                                                                                                                                                   | 6 Marks  | L2   | CO1        | PO2 |
| 2.  |       | Describe the following:<br>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)                                                                                                                                                                                                                    |          |      | <b>G A</b> |     |
| 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 |
|     |       |                                                                                                                                                                                                                         |          |      |            |     |
| 9.  |       | Sketch and explain the message formats supported by e-mail. (OR)                                                                                                                                                        | 12 Marks | L2   | CO4        | PO3 |
| 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

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Roll No.

Max. Marks: 60

## All questions carry equal marks

|     |          | UNIT-I                                                                                                                                                                   |                    |          |            |            |
|-----|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------|------------|------------|
| 1.  | a)<br>b) | Differentiate Linear and Nonlinear data structures.<br>What is Time complexity? What are Asymptotic notations?<br>Discuss the purpose of three notations.                | 4 Marks<br>8 Marks | L2<br>L4 | CO1<br>CO1 | PO2<br>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        |
| 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        |
| 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        |
| 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)<br>b) | What is Heap? Explain types of Heap.<br>Write an algorithm for heap sort and trace out by taking an example.                                                             | 6 Marks<br>6 Marks | L2<br>L3 | CO5<br>CO5 | PO1<br>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        |
| 10  | 8)       | (UK)<br>Write a program to implement Breadth First Search algorithm                                                                                                      | 6 Marks            | 13       | CO5        | PO1        |
| 10. | b)       | What is collision? What are different methods of collision resolution in hashing?                                                                                        | 6 Marks            | L2       | CO6        | PO2        |

|    | CODE     | No.: 20MC10104                                                                                                            |                     |        | SVE      | C-20 |
|----|----------|---------------------------------------------------------------------------------------------------------------------------|---------------------|--------|----------|------|
|    |          | Roll No.                                                                                                                  |                     |        |          |      |
|    |          | SREE VIDYANIKETHAN ENGINEERING COU<br>(An Autonomous Institution, Affiliated to JNTUA, Ananthapur                         | <b>LEGE</b><br>amu) |        |          |      |
|    |          | M.C.A. I Semester (SVEC-20) supplementary Examination                                                                     | ns Novemb           | er – 2 | 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<br>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  |
| 3. |          | Explain loop control statements whileelse and forin.else.<br>Write a python program to check given number is prime or not | 12 Marks            | L1     | CO2      | PO1  |
|    |          | using forin .else loop.                                                                                                   |                     |        |          |      |
| Δ  | a)       | (OK)<br>Describe list comprehension and list unpacking with suitable                                                      | 8 Marks             | Ι4     | $CO^{2}$ | PO4  |
| т. | a)<br>b) | examples.                                                                                                                 | 4 Morka             | 1.2    | CO2      |      |
|    | 0)       | UNIT-III                                                                                                                  | 4 Marks             | L      | 002      | rui  |
| 5. | a)       | Explain the string functions to remove unwanted white spaces in<br>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  |
| 6. | a)       | Discuss the types of arguments in python functions. Write a                                                               | 6 Marks             | L2     | CO3      | PO2  |
|    | ,        | python function to compute the area of a triangle of return the result.                                                   |                     |        |          |      |
|    | b)       | Explain the keywords of exception handling with example.                                                                  | 6 Marks             | L3     | CO3      | PO2  |
| 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  |
| 8. | a)       | Explain the concept of inheritance and types of inheritance in                                                            | 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  |
| 10 |          | (OR)                                                                                                                      | 10 14 1             | 1.2    | 005      | DO 5 |
| 10 |          | Define widgets and discuss buttons, labels.                                                                               | 12 Marks            | L2     | 005      | PO5  |

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CODE No.: 20MC2HS01

|          | <br> | <br> | - | SVEC- |  |  |  |  |  |
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| Roll No. |      |      |   |       |  |  |  |  |  |

### 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

CO1

**PO2** 

## 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 12 Marks L3 CO1 PO3 books of Pradeep Business.

| 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 12 Marks L3 Trading and Profit and loss account for the year ending

| 31 <sup>s</sup> | 1 <sup>st</sup> March, 2021 and the Balance sheet as on that date: |             |              |  |  |  |  |  |
|-----------------|--------------------------------------------------------------------|-------------|--------------|--|--|--|--|--|
|                 |                                                                    | 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 31<sup>st</sup> 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 ad accounting.                                                                                                                                                                                                                                                                                                                            | vantages and d       | isadvantages   | of computerized     | 12 Marks | L2 | CO1 | PO3 |
|     | C                                                                                                                                                                                                                                                                                                                                                     |                      | UNIT-          | III)                |          |    |     |     |
| 5.  | Explain the adva                                                                                                                                                                                                                                                                                                                                      | intages and disady   | vantages of ra | tio analysis.       | 12 Marks | L2 | CO2 | PO2 |
|     | 1                                                                                                                                                                                                                                                                                                                                                     | )                    |                |                     |          |    |     |     |
| 6.  | What are the pro                                                                                                                                                                                                                                                                                                                                      | fitability ratios? I | Explain them   | with an example.    | 12 Marks | L3 | CO2 | PO3 |
|     |                                                                                                                                                                                                                                                                                                                                                       |                      |                | ·IV)                |          |    |     |     |
| 7.  | The following information was extracted from the books of<br>M/s Ravi & Sons.<br>Sales = Rs.1,80,000<br>Variable Costs = Rs.1,44,000<br>Fixed costs = Rs.24,000<br>Calculate the following:<br>i) P/V ratio.<br>ii) Break-even point.<br>iii) Net profit earned at sales of Rs.2,70,000.<br>iv) Sales required to earn a profit of Rs.24,000.<br>(OR) |                      |                |                     | 12 Marks | L3 | CO2 | PO2 |
| 8.  | Explain the adva                                                                                                                                                                                                                                                                                                                                      | intages of break-e   | ven analysis   | in profit planning. | 12 Marks | L2 | CO2 | PO3 |
|     |                                                                                                                                                                                                                                                                                                                                                       |                      | UNIT           | - <b>v</b>          |          |    |     |     |
| 9.  | A company is c<br>Machines A and<br>after taxation are                                                                                                                                                                                                                                                                                                | 12 Marks             | L3             | CO2                 | PO2      |    |     |     |
|     | Year                                                                                                                                                                                                                                                                                                                                                  | Machine A (Rs        | s.) Machin     | e B (Rs.)           |          |    |     |     |
|     | 1                                                                                                                                                                                                                                                                                                                                                     | 24,000               | 8,             | 000                 |          |    |     |     |
|     | 2                                                                                                                                                                                                                                                                                                                                                     | 32,000               | 24             | ,000                |          |    |     |     |
|     | 3                                                                                                                                                                                                                                                                                                                                                     | 40,000               | 32             | ,000                |          |    |     |     |
|     | 4                                                                                                                                                                                                                                                                                                                                                     | 24,000               | 48             | 000                 |          |    |     |     |
|     |                                                                                                                                                                                                                                                                                                                                                       |                      |                |                     |          |    |     |     |
|     | Evaluate two all                                                                                                                                                                                                                                                                                                                                      | l                    |                |                     |          |    |     |     |
|     | should use a disc                                                                                                                                                                                                                                                                                                                                     | Sound fale of 10%    | (OD)           | )                   |          |    |     |     |
| 10. | Explain the Inter                                                                                                                                                                                                                                                                                                                                     | mal Rate of Retur    | n (IRR) with   | an example.         | 12 Marks | L2 | CO2 | PO3 |

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

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**CODE No.: 20MC20101** SVEC-20 Roll No. SREE VIDYANIKETHAN ENGINEERING COLLEGE (An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu) M.C.A. II Semester (SVEC-20) Regular 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 ) Explain the typical architecture of Data warehouse. 1. 6 Marks L3 PO3 CO1 a) Define data warehouse. Briefly describe the need for data b) 6 Marks L1 CO1 PO1 warehousing. (**OR**) Describe the steps involved in data mining when viewed as a 2. 7 Marks L3 CO1 PO3 a) process of knowledge discovery. Differentiate star and fact constellation schemas. b) 5 Marks L3 CO1 PO<sub>3</sub> UNIT-II ) 3. What kinds of patterns can be mined? 6 Marks L2 CO2 PO<sub>2</sub> a) Explain various disciplines that influences the development of b) 6 Marks L4 CO2 PO4 data mining methods. (**OR**) 4. a) Explain major tasks in data pre-processing. 6 Marks L4CO<sub>2</sub> **PO4** Discuss the approaches of data cleaning process. b) 6 Marks L4 CO2 PO4 (UNIT-III) 5. How to improve the efficiency of Apriori-based mining? 4 Marks L3 CO3 PO4 a) Explain Apriori algorithm for discovering frequent itemsets for b) 8 Marks L2 CO3 PO5 mining Boolean association rules. (**OR**) Explain how classification work with neat diagram. 6. a) 7 Marks L2 CO3 **PO2** Discuss the techniques to improve classification accuracy. 5 Marks L3 CO3 PO3 b) UNIT-IV) 7. Define Cluster analysis. Explain requirements of clustering in 5 Marks L2 CO4 PO4 a) data mining. Describe about partitioning methods k-means and k-medoids. 7 Marks L3 PO<sub>2</sub> b) CO4 (**OR**) 8. Differentiate agglomerative and divisive hierarchical clustering. PO3 a) 6 Marks L3 CO4 Discuss the technique to find dense regions in density-based 6 Marks L4 CO4 PO4 b) clustering. UNIT-V Explain how data mining useful for financial data analysis with 9. 6 Marks L2 PO1 a) CO5 suitable examples. b) Describe how web mining can be organized. 6 Marks L2 CO5 PO1 (**OR**) Describe various complex types of data for mining. 10 a) 6 Marks L3 CO5 PO<sub>3</sub> Discuss various statistical data mining techniques. b) 6 Marks L4 CO5 PO1

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| CODE No.: 20MC20102 |         | · · · · ·                                                                                        | SVEC-20                |       |          |     |
|---------------------|---------|--------------------------------------------------------------------------------------------------|------------------------|-------|----------|-----|
|                     |         | Roll No.                                                                                         |                        |       |          |     |
|                     |         | SREE VIDYANIKETHAN ENGINEERING CO<br>(An Autonomous Institution, Affiliated to JNTUA, Ananthapur | L <b>LEGE</b><br>ramu) |       |          |     |
|                     |         | M.C.A. II Semester (SVEC-20) Regular Examinations I                                              | November               | - 202 | 1        |     |
|                     |         | <b>OBJECT ORIENTED PROGRAMMING THROU</b>                                                         | GH JAVA                |       |          |     |
|                     | Time: 3 | b hours                                                                                          |                        | Max   | Marks:   | 60  |
|                     |         | Answer One Question from each Unit<br>All questions carry equal marks                            |                        |       |          |     |
|                     |         |                                                                                                  |                        |       |          |     |
| 1.                  | a)      | Highlight the object oriented features of Java.                                                  | 5 Marks                | L1    | CO1      | PO1 |
|                     | b)      | Define an array. Demonstrate multidimensional arrays. <b>(OR)</b>                                | 7 Marks                | L1    | CO1      | PO2 |
| 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 |
|                     |         |                                                                                                  |                        |       |          |     |
| 3                   |         | What is an abstract class and abstract method? Explain with a                                    | 12 Marks               | T 1   | $CO^{2}$ | PO4 |
| 5.                  |         | suitable program.                                                                                | 12 IvidiK5             | LI    | 002      | 104 |
|                     |         | (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 |
|                     |         |                                                                                                  |                        |       |          |     |
| 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                                   | 12 Marks               | L2    | CO3      | PO2 |
|                     |         | program.                                                                                         |                        |       |          | PO3 |
|                     |         |                                                                                                  |                        |       |          |     |
| 7                   |         | Explain in detail Thread Life Cycle with an example programs                                     | 12 Morka               | T 1   | CO4      |     |
| 1.                  |         | (OR)                                                                                             | 12 IVIALKS             | LI    | 004      | 105 |
| 8.                  |         | Explain exception handling in Java with an example program.                                      | 12 Marks               | L1    | CO4      | PO2 |
|                     |         |                                                                                                  |                        |       |          |     |
| 0                   |         | UNIT-V                                                                                           | 10.16 1                | т 1   | 004      | DOA |
| 9.                  |         | Describe Event Handling. Explain each one with an example.                                       | 12 Marks               | LI    | CO4      | PO3 |
| 10                  | _       | Explain the following Swing components:                                                          | 12 Marks               | L1    | CO4      | PO2 |
| - 0                 | -       | i) JTextField ii) JToggleButton                                                                  |                        | 21    | 201      | PO5 |
|                     |         | iii) JScrollPane iv) JComboBox                                                                   |                        |       |          | -   |
|                     |         |                                                                                                  |                        |       |          |     |

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**CODE No.: 20MC20103** SVEC-20 Roll No. SREE VIDYANIKETHAN ENGINEERING COLLEGE (An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu) M.C.A. II Semester (SVEC-20) Regular 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 Categorize the security services defined by X.800. 5 Marks **PO2** 1. L3 CO1 a) Show the Encryption and Decryption process of Caesar cipher b) 7 Marks L3 CO1 **PO2** substitution technique. (**OR**) L3 2. Tabulate the types of attacks on Encrypted messages. 5 Marks CO1 PO1 a) Relate how relative frequency of the English letters pave way for b) 7 Marks L2 CO1 PO<sub>2</sub> strong Cipher text generation in Monoalphabetic Ciphers. Discuss. UNIT-II ) Explain the encryption and decryption operation in ECB mode. 3. 6 Marks L2 a) CO3 **PO3** Analyze its advantages and disadvantages. Outline the design principles of block cipher. b) 6 Marks L3 CO3 PO1 (**OR**) Outline Diffie-Hellman Key Exchange algorithm. 4. 12 Marks L2 CO3 PO1 UNIT-III) Describe the overall architecture of SHA with message digest 5. 12 Marks L2 CO3 PO1 generation. (**OR**) Organize the technical deficiencies in Kerberos version 4 6. a) 6 Marks L3 CO3 PO1 protocol. Draw and label the X.509 certificate format. L2 PO4 6 Marks CO3 b) UNIT-IV 7. a) Summarize on PGP services. 7 Marks L3 CO<sub>2</sub> PO1 Identify the difference between top-level format and payload data CO2 5 Marks L2 PO1 b) of an ESP packet. (**OR**) 8. Identify the change when transport mode ESP is appended to an L2 CO2 PO<sub>2</sub> 6 Marks a) IP format and compare the results with the tunnel mode. Organize a scenario how message exchange occurs as pairs in L3 CO<sub>2</sub> PO<sub>3</sub> b) 6 Marks IKEv2. UNIT-V Discuss about the TLS Protocol Stack with a neat diagram and 9. 12 Marks L3 CO<sub>4</sub> PO1 outline the parameters of connection state. (**OR**) 10. Develop a model to show the interrelationship between the 12 Marks L3 CO4 PO<sub>2</sub> standardized protocols of SP 800-177 for assuring message Authenticity and Integrity. රුවු କ୍ର ÷
**CODE No.: 20MC20109** SVEC-20 Roll No. SREE VIDYANIKETHAN ENGINEERING COLLEGE (An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu) M.C.A. II Semester (SVEC-20) Regular 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**) Explain the version spaces and candidate elimination algorithm. 2. 12Marks L3 CO2 PO1 UNIT-II ) How inductive bias is applied in the training of decision tress? 3. 12Marks L2 CO1 PO2 (**OR**) 4. What are different activation functions in ANN? 12Marks L1 CO2 PO2 (UNIT-III) Explain bayes classifier for classification of text by providing 5. 12Marks L2 CO1 PO3 training and testing models. (**OR**) 6. Differentiate maximum likelihood and least squared error 12Marks L1 CO2 PO<sub>2</sub> hypothesis. UNIT-IV 7. Explain the concept of inverted deduction. 12Marks L1 CO2 PO<sub>2</sub> (**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 12Marks L2 CO4 PO<sub>2</sub> the overall performance of the learning models? (OR)What is the difference between Q – Leaning and temporal 10. 12Marks L3 CO4 PO2 difference learning?

(An Autonomous Institution, Affiliated to JNTUA, Anantapur)

Roll No.

#### M.C.A. III Semester (SVEC16) Supplementary Examinations August – 2021

#### **OBJECT ORIENTED ANALYSIS AND DESIGN**

[ MASTER OF COMPUTER APPLICATIONS ]

Max. Marks: 60

Time: 3 hours

**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.<br>i) Object life line.                   | CO1 | 12 Marks |
|     |    | ii) < <create>&gt; and &lt;<destroy>&gt; messages.</destroy></create>                                |     |          |
|     |    | iii) Focus of control.                                                                               |     |          |
|     |    | iv) Dewey decimal numbering.                                                                         |     |          |
|     |    | v) Nesting of tours of control.                                                                      |     |          |
|     |    | vi) Semantic equivalence.                                                                            |     |          |
|     |    | 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.                                   | COL | 3 Marks  |
|     | c) | Model the benavior of an ATM machine with the help of a state chart                                  | CO4 | 6 Marks  |
|     |    | (OR)                                                                                                 |     |          |
| 8   |    | Infer the states that are associated with Borrowing a book from a library                            | CO5 | 12 Marks |
| 0.  |    | system. Draw the state chart diagram that explains various states of a book                          | 000 |          |
|     |    | during the processing.                                                                               |     |          |
|     |    | UNIT-V                                                                                               |     |          |
| 9.  |    | Demonstrate various objects participating in the library information                                 | CO5 | 12 Marks |
|     |    | system. Explain the object diagram that is associated with various                                   |     |          |
|     |    | interactions with a neat diagram.                                                                    |     |          |
|     |    | (OR)                                                                                                 |     |          |
| 10. |    | Adapt common modeling techniques to implement deployment.                                            | CO3 | 12 Marks |

artifact diagrams.

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.C.A. IV Semester (SVEC-19) Regular Examinations August – 2021

|     |          | <b>OBJECT ORIENTED ANALYSIS AND DE</b>                                                                                                                                                                                                                                                                              | SIGN     |          |            |            |  |  |  |  |  |  |  |  |
|-----|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|------------|------------|--|--|--|--|--|--|--|--|
| Ti  | me: 3    | Max. Marks: 60                                                                                                                                                                                                                                                                                                      |          |          |            |            |  |  |  |  |  |  |  |  |
|     | UNIT-I   |                                                                                                                                                                                                                                                                                                                     |          |          |            |            |  |  |  |  |  |  |  |  |
| 1   |          | Define a Madel What is the importance of modeling?                                                                                                                                                                                                                                                                  | 6 Martra | т 1      | CO1        |            |  |  |  |  |  |  |  |  |
| 1.  | a)<br>b) | Explain the role of object-oriented modeling in design.                                                                                                                                                                                                                                                             | 6 Marks  | L1<br>L1 | CO1<br>CO1 | PO1<br>PO2 |  |  |  |  |  |  |  |  |
| 2.  |          | Enumerate the steps for the following:<br>i) Modeling different views of a system.<br>ii) Modeling different levels of abstraction.                                                                                                                                                                                 | 12 Marks | L2       | CO1        | PO3        |  |  |  |  |  |  |  |  |
| 2   |          | List the store to model simple collaborations                                                                                                                                                                                                                                                                       | 6 Martra | тэ       | CO1        |            |  |  |  |  |  |  |  |  |
| 5.  | a)<br>b) | What do you mean by the term Classifier? Identify all the types of classifiers that UML provides in modeling.                                                                                                                                                                                                       | 6 Marks  | L2<br>L3 | CO1<br>CO2 | PO3<br>PO2 |  |  |  |  |  |  |  |  |
| 4.  | a)       | ( <b>OK</b> )<br>What is an Association class? Compare simple aggregation with<br>composite aggregation                                                                                                                                                                                                             | 4 Marks  | L2       | CO2        | PO4        |  |  |  |  |  |  |  |  |
|     | b)       | Design a class diagram rendering an ATM system using the following:                                                                                                                                                                                                                                                 | 8 Marks  | L4       | CO4        | PO5        |  |  |  |  |  |  |  |  |
|     |          | i) Notes.<br>iii) Stereotypes.<br>iii) Other Adornments.<br><b>iv</b> ) Tagged Values.<br><b>UNIT-III</b>                                                                                                                                                                                                           |          |          |            |            |  |  |  |  |  |  |  |  |
| 5.  | a)       | Draw a Use case diagram for the scenario of cellular network that<br>place a phone call correctly and also schedule the receiving and<br>conference calls.                                                                                                                                                          | 6 Marks  | L4       | CO3        | PO4        |  |  |  |  |  |  |  |  |
|     | b)       | Explain the steps to model the context of a system. (OR)                                                                                                                                                                                                                                                            | 6 Marks  | L2       | CO2        | PO3        |  |  |  |  |  |  |  |  |
| 6.  |          | <ul> <li>Explain the following with respect to interaction diagrams:</li> <li>i) Object lifeline ii) &lt;<create>&gt; and &lt;<destroy>&gt; messages.</destroy></create></li> <li>iii) Focus of control. iv) Dewey decimal numbering.</li> <li>v) Nesting of tours of control. vi) Semantic equivalence.</li> </ul> | 12 Marks | L2       | CO3        | PO2        |  |  |  |  |  |  |  |  |
| 7.  |          | Infer the states that are associated with " <i>borrowing a book</i> " from<br>a Library Management System. Draw the state chart diagram and<br>explain various states of a book during the transaction.<br>(OR)                                                                                                     | 12 Marks | L2       | CO3        | PO5        |  |  |  |  |  |  |  |  |
| 8.  |          | Compare the following:<br>i) Event and Signal.<br>ii) Sequential substates and Concurrent substates.                                                                                                                                                                                                                | 12 Marks | L4       | CO3        | PO4        |  |  |  |  |  |  |  |  |
| 9.  | a)       | Explain the deployment diagram for modeling an embedded system.                                                                                                                                                                                                                                                     | 6 Marks  | L2       | CO3        | PO3        |  |  |  |  |  |  |  |  |
|     | b)       | Design a model to represent " <i>issuing a book</i> " operation using UML collaboration diagram with appropriate notations. <b>(OR)</b>                                                                                                                                                                             | 6 Marks  | L2       | CO3        | PO3        |  |  |  |  |  |  |  |  |
| 10. | a)       | Enumerate the steps in Modeling Adaptable Systems.                                                                                                                                                                                                                                                                  | 6 Marks  | L2       | CO3        | PO3        |  |  |  |  |  |  |  |  |
|     | b)       | Illustrate the process of forward and reverse engineering the                                                                                                                                                                                                                                                       | 6 Marks  | L3       | CO3        | PO3        |  |  |  |  |  |  |  |  |

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M.C.A. IV Semester (SVEC-19) Regular Examinations August – 2021

## LINUX PROGRAMMING

| Т  | Time: 3 hours Answer One Ouestion from each Unit |                                                                                                                                                                                                                                                                                                                                                                                                              |                  |       |     |            |  |  |
|----|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------|-----|------------|--|--|
|    |                                                  | All questions carry equal marks                                                                                                                                                                                                                                                                                                                                                                              |                  |       |     |            |  |  |
|    |                                                  |                                                                                                                                                                                                                                                                                                                                                                                                              |                  |       |     |            |  |  |
| 1. | a)                                               | Mention the significance of the following commands.<br>i) $ls = ld$ ii) $ls = 1$                                                                                                                                                                                                                                                                                                                             | 6 Marks          | L2    | CO1 | PO1        |  |  |
|    | b)                                               | How the <i>'sed'</i> can be implemented to filter the patterns for a text file?                                                                                                                                                                                                                                                                                                                              | 6 Marks          | L2    | CO1 | PO1        |  |  |
| 2  | a)                                               | List and explain disk and backup utilities available in Linux                                                                                                                                                                                                                                                                                                                                                | 8 Marks          | L2    | CO1 | PO1        |  |  |
| 2. | b)                                               | How to use system commands in awk?                                                                                                                                                                                                                                                                                                                                                                           | 4 Marks          | $L^2$ | CO1 | PO2        |  |  |
|    | 0)                                               | UNIT-II                                                                                                                                                                                                                                                                                                                                                                                                      | i in <b>u</b> no | 2.    | 001 | 102        |  |  |
| 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<br>PO3 |  |  |
|    | b)                                               | Provide the syntax for ' <i>case</i> ' 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<br>parent to display "Hello" and the child to display "Welcome" on<br>the screen                                                                                                                                                                                                                                                                  | 6 Marks          | L3    | CO4 | PO3        |  |  |
|    | b)                                               | Illustrate is detail about <i>sigsetjump()</i> and <i>siglongjump()</i> API's.                                                                                                                                                                                                                                                                                                                               | 6 Marks          | L2    | CO4 | PO3        |  |  |
| 8. | a)                                               | Codify the syntax and explain each of the given functions with a suitable example.                                                                                                                                                                                                                                                                                                                           | 6 Marks          | L3    | CO4 | PO4        |  |  |
|    | b)                                               | Provide the syntax for the following with suitable example.<br>i) kill. ii) alarm interval timers.                                                                                                                                                                                                                                                                                                           | 6 Marks          | L3    | CO4 | PO4        |  |  |

# UNIT-V

9. How socket system calls can be adopted for connectionless 12 Marks L4 CO2 PO2 protocol?

#### (OR)

- a) Apply the stream socket in a Client/Server program.
  b) Write syntax with a suitable example for the following socket
  6 Marks
  CO5
  PO2
  - API's.
    - i) socket(). ii) bind(). iii) listen(). iv) connect(). v) accept().

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# M.C.A. IV Semester (SVEC-19) Regular Examinations August – 2021

# WEB PROGRAMMING

| Ti  | Time: 3 hours                                                         |                                                                                                                                                  |          |     |     |     |  |  |  |  |  |  |  |  |
|-----|-----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----|-----|-----|--|--|--|--|--|--|--|--|
|     | Answer One Question from each Unit<br>All questions carry equal marks |                                                                                                                                                  |          |     |     |     |  |  |  |  |  |  |  |  |
|     |                                                                       |                                                                                                                                                  |          |     |     |     |  |  |  |  |  |  |  |  |
| 1.  |                                                                       | Discuss structure of HTML program with suitable example. (OR)                                                                                    | L2       | CO2 | PO2 |     |  |  |  |  |  |  |  |  |
| 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 " <i>Valid</i> " XML document is " <i>Well Formed</i> ", as well as it conforms to the rules of a Document Type Definition (DTD). (OR) | 12 Marks | L5  | CO5 | PO5 |  |  |  |  |  |  |  |  |
| 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.<br>(OR)                                                                                   | 12 Marks | L1  | CO1 | PO1 |  |  |  |  |  |  |  |  |
| 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. (OR)                                                                                  | 12 Marks | L4  | CO4 | PO4 |  |  |  |  |  |  |  |  |
| 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 |  |  |  |  |  |  |  |  |
| 10. |                                                                       | (OR)<br>Implement files in PHP to read and write the contents of the file.                                                                       | 12 Marks | L5  | CO6 | PO5 |  |  |  |  |  |  |  |  |
|     |                                                                       |                                                                                                                                                  |          |     |     |     |  |  |  |  |  |  |  |  |

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M.C.A. IV Semester (SVEC-19) Regular Examinations August – 2021

# **BLOCKCHAIN TECHNOLOGIES**

| Т   | ime: 3 | Max. Marks: 60                                                                                                                                                  |          |     |     |                   |  |  |  |  |  |  |  |  |  |
|-----|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----|-----|-------------------|--|--|--|--|--|--|--|--|--|
|     |        |                                                                                                                                                                 |          |     |     |                   |  |  |  |  |  |  |  |  |  |
|     |        |                                                                                                                                                                 |          |     |     |                   |  |  |  |  |  |  |  |  |  |
| 1.  |        | Design the network view of a blockchain and explain the components in it.                                                                                       | 12 Marks | L3  | CO1 | PO1<br>PO3        |  |  |  |  |  |  |  |  |  |
| 2.  |        | What are the elements needed to achieve full ecosystem decentralization?                                                                                        | 12 Marks | L2  | CO1 | PO1<br>PO2        |  |  |  |  |  |  |  |  |  |
| 2   |        | UNIT-II                                                                                                                                                         | 10.14    | T 1 | 000 | DOO               |  |  |  |  |  |  |  |  |  |
| 3.  |        | Define a transaction in blockchain. Discuss the life cycle of a transaction.                                                                                    | 12 Marks | LI  | CO2 | PO2<br>PO3        |  |  |  |  |  |  |  |  |  |
| 4.  |        | Classify the theoretical foundations which had give scope for altcoins.                                                                                         | 12 Marks | L2  | CO2 | PO2<br>PO5        |  |  |  |  |  |  |  |  |  |
|     |        | UNIT-III)                                                                                                                                                       |          |     |     |                   |  |  |  |  |  |  |  |  |  |
| 5.  | a)     | Discuss the importance of the smart contracts and build the templates of smart contracts.                                                                       | 6 Marks  | L2  | CO2 | PO3<br>PO5        |  |  |  |  |  |  |  |  |  |
|     | b)     | Describe the importance of Oracles in smart contract ecosystem.<br>(OR)                                                                                         | 6 Marks  | L2  | CO5 | PO5               |  |  |  |  |  |  |  |  |  |
| 6.  |        | Demonstrate the working environment of Block Apps platform.                                                                                                     | 12 Marks | L3  | CO4 | PO3<br>PO4<br>PO5 |  |  |  |  |  |  |  |  |  |
|     |        |                                                                                                                                                                 |          |     |     | 100               |  |  |  |  |  |  |  |  |  |
| 7.  |        | Illustrate the importance of Ethereum blockchain.                                                                                                               | 12 Marks | L2  | CO2 | PO1<br>PO2        |  |  |  |  |  |  |  |  |  |
|     |        | (OR)                                                                                                                                                            |          |     |     | 102               |  |  |  |  |  |  |  |  |  |
| 8.  | a)     | Express the key functions of miner in Ethereum blockchain.                                                                                                      | 6 Marks  | L2  | CO2 | PO2<br>PO5        |  |  |  |  |  |  |  |  |  |
|     | b)     | Identify the components of Messages in Ethereum environment.                                                                                                    | 6 Marks  | L2  | CO5 | PO5<br>PO6        |  |  |  |  |  |  |  |  |  |
|     |        | UNIT-V                                                                                                                                                          |          |     |     |                   |  |  |  |  |  |  |  |  |  |
| 9.  |        | <ul> <li>Write a short notes on the following:</li> <li>i) Block Size Increase.</li> <li>ii) Block Interval Reduction.</li> <li>iii) State Channels.</li> </ul> | 12 Marks | L2  | CO3 | PO2<br>PO3        |  |  |  |  |  |  |  |  |  |
| 10  |        | (OR)                                                                                                                                                            | 10.16-1  | т о | 002 | DOC               |  |  |  |  |  |  |  |  |  |
| 10. |        | Recognize how the blockchain has changed the business environment.                                                                                              | 12 Marks | L2  | CO3 | PO2               |  |  |  |  |  |  |  |  |  |

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SVEC-19

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M.C.A. IV Semester (SVEC-19) Regular Examinations, August – 2021

#### **INFORMATION RETRIEVAL SYSTEMS**

| T   | ime: 3                                                                | hours                                                                                                              |          | Max. | Marks: ( | 50           |  |  |  |  |  |  |  |
|-----|-----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|----------|------|----------|--------------|--|--|--|--|--|--|--|
|     | Answer One Question from each Unit<br>All questions carry equal marks |                                                                                                                    |          |      |          |              |  |  |  |  |  |  |  |
|     |                                                                       |                                                                                                                    |          |      |          |              |  |  |  |  |  |  |  |
| 1.  | a)                                                                    | How information retrieval system is related to database management system?                                         | 6 Marks  | L4   | CO3      | PO2<br>PO5   |  |  |  |  |  |  |  |
|     | b)                                                                    | Discuss about digital libraries and data warehouses.                                                               | 6 Marks  | L2   | CO1      | PO2<br>PO3   |  |  |  |  |  |  |  |
|     |                                                                       | (OR)                                                                                                               |          |      |          |              |  |  |  |  |  |  |  |
| 2.  |                                                                       | What are miscellaneous capabilities in Information Retrieval Systems? Describe vocabulary browse and canned query. | 12 Marks | L2   | CO1      | PO2<br>PO5   |  |  |  |  |  |  |  |
|     |                                                                       | (UNIT-II)                                                                                                          |          |      |          |              |  |  |  |  |  |  |  |
| 3.  |                                                                       | Illustrate the objectives of cataloging and indexing.                                                              | 12 Marks | L4   | CO1      | PO2<br>PO5   |  |  |  |  |  |  |  |
|     |                                                                       | (OR)                                                                                                               | 10361    |      | 004      | <b>D O A</b> |  |  |  |  |  |  |  |
| 4.  |                                                                       | Discuss about N-grams and Practical Algorithm To retrieve<br>Information (PAT) data structures with example.       | 12 Marks | L2   | COI      | PO2<br>PO5   |  |  |  |  |  |  |  |
|     |                                                                       | (UNIT-III)                                                                                                         |          |      |          |              |  |  |  |  |  |  |  |
| 5.  | a)                                                                    | Differentiate statistical indexing and concept indexing.                                                           | 6 Marks  | L4   | CO3      | PO2          |  |  |  |  |  |  |  |
|     | b)                                                                    | Explain hypertext linkages with suitable example.<br>(OR)                                                          | 6 Marks  | L2   | CO3      | POI          |  |  |  |  |  |  |  |
| 6.  |                                                                       | How manual clustering and automatic term clustering can be performed with suitable example?                        | 12 Marks | L3   | CO2      | PO2<br>PO3   |  |  |  |  |  |  |  |
|     |                                                                       | (UNIT-IV)                                                                                                          |          |      |          |              |  |  |  |  |  |  |  |
| 7.  |                                                                       | List out user search techniques. Explain any two search techniques with suitable example.                          | 12 Marks | L3   | CO3      | PO5          |  |  |  |  |  |  |  |
| 8   |                                                                       | (UK)<br>Discuss various information visualization technologies                                                     | 12 Marks | 12   | $CO^{2}$ |              |  |  |  |  |  |  |  |
| 0.  |                                                                       |                                                                                                                    | 12 WAIKS | L4   | 02       | PO2          |  |  |  |  |  |  |  |
| 0   |                                                                       | Identify the importance of herdware usage in Text search system                                                    | 12 Marka | 12   | $CO^{2}$ |              |  |  |  |  |  |  |  |
| 9.  |                                                                       | Explain in detail Hardware text search system.                                                                     | 12 Marks | L2   | 02       | PO1<br>PO5   |  |  |  |  |  |  |  |
| 10. |                                                                       | Implement Knuth-Pratt-Morris algorithm with suitable example.                                                      | 12 Marks | L3   | CO2      | PO3<br>PO5   |  |  |  |  |  |  |  |

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## MCA V Semester (SVEC-16) Supplementary Examinations August - 2021

#### **INFORMATION SECURITY** [Master of Computer Applications]

Max. Marks: 60

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

# 

| 1  | a)<br>b) | Analyze the problems associated with the One-Time pad.<br>What is a Transposition Cipher? Demonstrate Rail Fence cipher technique | CO2<br>CO3 | 4 Marks<br>8 Marks |
|----|----------|-----------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|
|    | 0)       | with an example.                                                                                                                  | 005        | 0 WILLING          |
|    |          | (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?<br>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<br>authentication dialogue and more secure authentication dialogue.   | CO2        | 12 Marks           |
|    |          |                                                                                                                                   |            |                    |
| 7  |          | Illustrate the operational description and implementation of PGP. <b>(OR)</b>                                                     | CO4        | 12 Marks           |
| 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?<br>(OR)                                                                  | CO2        | 6 Marks            |
| 10 |          | What is a Firewall? Classify the types of firewalls and list the capabilities and limitations of firewall.                        | CO2        | 12 Marks           |
|    |          |                                                                                                                                   |            |                    |

Time: 3 hours

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

#### **DATABASE MANAGEMENT SYSTEMS**

|    | Time: | 3 hours                                                                                                                                                                                                        |          | Max. 1 | Marks: 6 | 0                 |
|----|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|--------|----------|-------------------|
|    |       | Answer One Question from each Unit<br>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<br>PO2        |
|    | b)    | Construct database system 3-tier architecture with neat diagram.                                                                                                                                               | 5 Marks  | L2     | CO1      | PO1<br>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<br>PO3        |
|    | b)    | Identify various database languages with examples.                                                                                                                                                             | 6 Marks  | L2     | CO1      | PO1<br>PO2        |
|    |       | UNIT-II)                                                                                                                                                                                                       |          |        |          |                   |
| 3. |       | Identify the derived and composite attributes, strong and weak<br>entity sets and relationships for banking enterprise system with a<br>neat E-R diagram.                                                      | 12 Marks | L3     | CO2      | PO2<br>PO3        |
| 1  |       | (UR)                                                                                                                                                                                                           | 12 Marka | 12     | CO2      |                   |
| 4. |       | SQL.                                                                                                                                                                                                           | 12 Marks | LS     | 02       | PO1<br>PO2<br>PO5 |
|    |       | (UNIT-III)                                                                                                                                                                                                     |          |        |          |                   |
| 5. |       | What is the relationship exists between 3 Normal Form (NF) and<br>Boyce Code Normal Form (BCNF)? Distinguish 3NF and<br>BCNF. Consider any one relational schema which is in 2 NF and<br>convert it into BCNF. | 12 Marks | L4     | CO1      | PO1<br>PO2<br>PO3 |
| 6  |       | Make use of Structured Ouery Language in solving the following                                                                                                                                                 | 12 Marks | 13     | $CO^{2}$ | PO1               |
| 0. |       | with relevant example:<br>i) Nested queries.<br>ii) Joins.                                                                                                                                                     | 12 Marks | ĽĴ     | 02       | PO2<br>PO5        |
|    |       | III) Aggregate functions.                                                                                                                                                                                      |          |        |          |                   |
| 7  |       |                                                                                                                                                                                                                | 12.14    | т 2    | 001      | DO 1              |
| 1. |       | technique for serial execution and interleaved execution.                                                                                                                                                      | 12 Marks | L3     | COI      | PO1<br>PO2        |
| 8. |       | Analyze the steps involved in recovering from system crash.                                                                                                                                                    | 12 Marks | L4     | CO1      | PO1<br>PO2        |
|    |       |                                                                                                                                                                                                                |          |        |          | -                 |
| 9. |       | Describe in detail about B+ tree indexing method. List out the rules for construction of B+ tree.                                                                                                              | 12 Marks | L2     | CO2      | PO1<br>PO2        |
| 10 |       | (OR)<br>Illustrate Indexed Sequential Access Method (ISAM) index                                                                                                                                               | 12 Marks | L2     | CO2      | PO1               |
| •  |       | structure with a neat sketch.                                                                                                                                                                                  |          |        |          | PO3               |
|    |       | w w                                                                                                                                                                                                            |          |        |          |                   |

(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. Identify different levels of abstraction for the software design. 6 Marks L2 CO1 PO1 a) PO<sub>2</sub> Elucidate in detail about Adaptive Software Development. 6 Marks b) L1 CO1 PO1 (**OR**) Inspect the situations where Waterfall Model is most appropriate. PO1 2. a) 6 Marks L3 CO1 PO<sub>2</sub> L2 CO1 b) List out generic process framework activities. 6 Marks PO1 PO2 UNIT-II **PO1** 3. Design the state diagram for analysis classes for the control panel 6 Marks L3 CO<sub>2</sub> a) class. PO<sub>3</sub> Elucidate in detail about Class-Responsibility Collaborator L2 b) 6 Marks CO1 PO1 modeling. (**OR**) Explain in detail about the following concepts: 12 Marks L1 CO1 PO1 4. i) Cardinality and Modality. ii) Relationships. UNIT-III) Design Data Centered Architecture and the Data Flow 5. 12 Marks L2 CO<sub>2</sub> PO1 Architecture from the Architectural Styles with explanation. PO<sub>3</sub> (**OR**) 6. Write the design steps to map data flow diagram into 12 Marks L3 CO<sub>2</sub> PO1 architecture. Represent the context level Data Flow Diagram PO<sub>3</sub> (DFD) for the Safe Home security function. UNIT-IV What is the purpose of Unit Testing? What are the unit test L4 CO1 7. a) 6 Marks PO1 considerations to be focused? PO2 Illustrate strategic issues in Testing strategies. CO1 PO1 b) 6 Marks L3 PO<sub>3</sub> (**OR**) 8. How user analysis can be done in interface analysis with suitable 12 Marks L4 CO<sub>2</sub> PO1 example? PO2 PO3 UNIT-V Distinguish between Reactive Vs proactive risk strategies in 9. 12 Marks L2 CO1 PO1 detail. PO2 (**OR**) 10 Explain in detail about formal technical reviews. 5 Marks L2 CO1 PO1 a) PO<sub>2</sub> Provide measures of software quality which provide useful 7 Marks I.4 CO<sub>2</sub> PO1 b) indicators for the project team. PO<sub>3</sub> ලි ٢ŵ ැබ

**Time: 3 hours** 

# 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

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

|    |    | (UNIT-I)                                                                                                                               |            |          |
|----|----|----------------------------------------------------------------------------------------------------------------------------------------|------------|----------|
| 1  |    | State and explain the classification of things with UML notation. (OR)                                                                 | CO1        | 12 Marks |
| 2  | a) | Justify which UML diagrams give a static view and which give a dynamic view of a system.                                               | CO2        | 6 Marks  |
|    | b) | <ul> <li>i) Represent how model simple dependencies.</li> <li>ii) Write a short note on structural relationships.</li> </ul>           | CO3<br>CO1 | 6 Marks  |
| 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<br>the receiving and conference calls. Draw a class diagram | CO5        | 6 Marks  |
|    |    |                                                                                                                                        |            |          |
| _  | `` |                                                                                                                                        | 005        | 7 1 1    |
| 3  | a) | Draw a collaboration diagram that specifies the flow of control involved in                                                            | 005        | / Marks  |
|    | h) | Elucidate usecase diagram with suitable example                                                                                        | CO1        | 5 Marks  |
|    | 0) | (OR)                                                                                                                                   | COI        | JIVIAINS |
| 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:                                                                                                                 | CO2        | 12 Marks |
|    |    | i) Event vs Signal.                                                                                                                    |            |          |
|    |    | ii) Sequential substates vs Concurrent substates.                                                                                      |            |          |
|    |    | 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  |
| 10 | `` | (OR)                                                                                                                                   | 001        |          |
| 10 | a) | Explain the following terms:                                                                                                           | COI        | 6 Marks  |
|    |    | i) Doploymont Diagram.                                                                                                                 |            |          |
|    | b) | Explain the interaction diagrams for "renewal of a book" operation in a library application.                                           | CO5        | 6 Marks  |
|    |    | \$ 11<br>& & &                                                                                                                         |            |          |

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

#### **OPERATIONS RESEARCH**

|    | Time: | 3 hours        |           |         |         |                |                         |                       |                                                                   |                         |          | Max. | Marks: 6 | 0   |
|----|-------|----------------|-----------|---------|---------|----------------|-------------------------|-----------------------|-------------------------------------------------------------------|-------------------------|----------|------|----------|-----|
|    |       |                |           |         | Α       | nswer<br>All q | One (<br>uestio         | Questi<br>ns car      | on fro<br>ry equ                                                  | n each Unit<br>al marks |          |      |          |     |
|    |       |                |           |         |         |                | $\subset$               | UNI                   | <b>T-I</b> )                                                      |                         |          |      |          |     |
| 1. | a)    | Explai         | n differe | ent pha | ses of  | Opera          | tions H                 | Researd               | ch.                                                               |                         | 4 Marks  | L1   | CO1      | PO1 |
|    | b)    | Use gr         | aphical   | metho   | d to so | lve the        | follow                  | ving L                | PP.                                                               |                         | 8 Marks  | L3   | CO2      | PO1 |
|    |       |                |           |         |         | Maxin          | nize Z                  | = 8 X                 | $_{1}$ +5 X <sub>2</sub>                                          |                         |          |      |          | PO2 |
|    |       |                |           |         | Sı      | ubject         | to 2 X                  | $_{1} + X_{2}$        | <b>≤ 500</b>                                                      |                         |          |      |          | PO3 |
|    |       |                |           |         |         |                |                         | X                     | $1 \le 150$                                                       |                         |          |      |          |     |
|    |       |                |           |         |         |                |                         | <b>X</b>              | $_2 \leq 25$                                                      |                         |          |      |          |     |
|    |       |                |           |         |         |                |                         | $X_1, X_2$            | $_2 \geq 0$                                                       |                         |          |      |          |     |
| ~  |       | C 1            | 4 6 11    | · •     | חח      | . т            | DI                      | (0)                   | R)                                                                | (1 1                    | 10.16 1  | т 2  | 000      |     |
| 2. |       | Solve          | the follo | wing I  | _PP us  | ing Iv         | vo-Pha                  | ise sim               | $r_{z}$                                                           | ethod:                  | 12 Marks | L3   | CO2      | POI |
|    |       |                |           | Ma      | ant to  | eL = 2         | -4A                     | $A_1 - 3 X$           | $x_2 - y_2$                                                       | <b>X</b> 3              |          |      |          | PO2 |
|    |       |                |           | subj    |         | 2 A<br>6 V     | 1 <b>+ 4</b> 2<br>′ ⊥ V | $\mathbf{X}_2 \neq 0$ | $\begin{array}{c} \Lambda_3 \geq 1 \\ V > 1^{\prime} \end{array}$ | 5                       |          |      |          |     |
|    |       |                |           |         |         | 0 A<br>91/     | 4 Τ.Λ.                  | $2 \pm 0$<br>V. V.    | $A_3 \ge 1$                                                       | 2                       |          |      |          |     |
|    |       |                |           |         |         | an             | и <b>л</b> і,           | Λ2 , Λ3               | $r_{-TT}$                                                         |                         |          |      |          |     |
| 2  |       | <b>XX</b> 71 4 | 1         |         | 1       | 1              |                         |                       | <u></u>                                                           | D 11                    | 1234 1   | т 4  | 002      |     |
| 3. |       | w nat          | do you    | mean    | by an   | unda           | ianced                  | 1 rans                | sportati                                                          | on Problem              | 12 Marks | L4   | 003      | POI |
|    |       | (1.P)?         | Solve tr  | ie iono | owing   | ו.P. us<br>ד   | sing v                  | oger s                | method                                                            | 1.                      |          |      |          | PO2 |
|    |       |                |           | Δ       | D       |                |                         | Б                     | Б                                                                 | Availabla               |          |      |          | rUs |
|    |       | cit            | 1         | A<br>0  | D<br>12 |                | 6                       |                       | <u>Г</u><br>10                                                    | Available               |          |      |          |     |
|    |       | u mo           | 1<br>2    | 7       | 12      | 7              | 7                       | 9<br>5                | 10                                                                | 5                       |          |      |          |     |
|    |       | Fr             | 2         | 6       | 5       | 0              | 11                      | 3                     | 11                                                                | 2                       |          |      |          |     |
|    |       |                | <u> </u>  | 6       | 8       | 11             | 2                       | $\frac{3}{2}$         | 10                                                                | <u>2</u><br>0           |          |      |          |     |
|    |       | Requi          | rement    | 4       | <u></u> | 6              | $\frac{2}{2}$           | $\frac{2}{4}$         | $\frac{10}{2}$                                                    | ,                       |          |      |          |     |
|    |       | Requi          |           | -       |         | 0              | 4                       | <u> </u>              | R)                                                                | 11                      |          |      |          |     |
| 4. |       | Solve          | the follo | owing   | assigni | ment p         | robler                  | n:                    | ( <b>x</b> )                                                      |                         | 12 Marks | L4   | CO3      | PO1 |
|    |       |                |           |         |         |                |                         |                       |                                                                   |                         |          |      |          | 102 |
|    |       |                |           |         |         |                |                         |                       |                                                                   |                         |          |      |          |     |
|    |       |                |           |         |         |                |                         |                       |                                                                   |                         |          |      |          |     |

| les      |   |    |    | Jobs |    |    |  |  |  |  |
|----------|---|----|----|------|----|----|--|--|--|--|
| chit     |   | Α  | В  | С    | D  | Е  |  |  |  |  |
| Ma       | А | 30 | 25 | 33   | 35 | 36 |  |  |  |  |
|          | В | 23 | 29 | 38   | 23 | 26 |  |  |  |  |
|          | С | 30 | 27 | 22   | 22 | 22 |  |  |  |  |
|          | D | 25 | 31 | 29   | 27 | 32 |  |  |  |  |
|          | Е | 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                 | Е             | F                | G            | Н                           | 1         |           |     |     |            |
|----|-----|--------------------------------------------------------|-------------------------------|------------------------|-------------------|---------------|------------------|--------------|-----------------------------|-----------|-----------|-----|-----|------------|
|    |     | DTP                                                    | 14 26                         | 17                     | 11                | 9             | 26               | 18           | 15                          | 1         |           |     |     |            |
|    |     | Printing                                               | 21 15                         | 16                     | 21                | 22            | 12               | 13           | 25                          | 1         |           |     |     |            |
|    |     | U                                                      | •                             |                        |                   | (0            | DR)              |              |                             | -         |           |     |     |            |
| 6. |     | The probability                                        | of failure                    | (Pn) ju                | ist bef           | fore a        | ge n y           | ears is      | s sho                       | wn        | 12 Marks  | L3  | CO3 | PO1        |
|    |     | below. If ind                                          | ividual re                    | placem                 | ent co            | osts I        | Rs.12 <b>.</b> 5 | 0 and        | d gro                       | oup       |           |     |     | PO2        |
|    |     | replacement cos                                        | ts Rs.3.00                    | per ite                | m, fin            | d the         | optima           | l repla      | acem                        | ent       |           |     |     |            |
|    |     | policy.                                                |                               |                        |                   |               |                  |              | 7                           |           |           |     |     |            |
|    |     | Year                                                   | ( <b>n</b> )                  | 2                      | 3                 | -             | 4                | 5            | 4                           |           |           |     |     |            |
|    |     | P <sub>n</sub>                                         | 0.1                           | 0.2                    | 0.2               | 25   (        | ).3              | 0.15         |                             |           |           |     |     |            |
|    |     |                                                        |                               |                        | C                 | UNI           | T-IV             | )            |                             |           |           |     |     |            |
| 7. | a)  | Explain the follo                                      | owing:                        |                        |                   |               |                  |              |                             |           | 4 Marks   | L1  | CO1 | PO1        |
|    |     | i) Princi                                              | ple of Max                    | kimin –                | Minn              | nax           |                  |              |                             |           |           |     |     | PO2        |
|    | 1 \ | 11) Pure $a$                                           | and Mixed                     | strateg                | jies.             |               |                  |              |                             |           |           | т о | 004 | DOG        |
|    | b)  | Using dominance                                        | e method                      | solve t                | ne foll           | owing         | g game           |              |                             |           | 8 Marks   | L3  | CO4 | PO2        |
|    |     |                                                        |                               | T                      |                   | $\frac{1}{1}$ | <u> </u>         |              | 7                           |           |           |     |     | POS        |
|    |     |                                                        | T                             | 2                      |                   | 1<br>)        | <u> </u>         |              | <u>/</u>                    |           |           |     |     |            |
|    |     | Player-A                                               |                               | 2                      |                   | 1             | 4<br>2           |              | '                           |           |           |     |     |            |
|    |     |                                                        | II                            |                        |                   | <del>†</del>  | <u></u><br>      |              |                             |           |           |     |     |            |
|    |     |                                                        | IV                            |                        |                   | 1             |                  |              | 2                           |           |           |     |     |            |
|    |     |                                                        | 17                            | 0                      |                   | <u> </u>      | )R)              |              | ,                           |           |           |     |     |            |
| 8. |     | An automobile r                                        | production                    | line tu                | rns ou            | it aboi       | ut 100           | cars a       | dav l                       | but       | 12 Marks  | L4  | CO4 | PO1        |
|    |     | deviations occur                                       | r owing to                    | many                   | cause             | s. The        | e produ          | iction       | is m                        | ore       |           |     |     | PO2        |
|    |     | accurately descr                                       | ibed by the                   | e proba                | bility            | distril       | oution           | given        | below                       | W         |           |     |     | PO3        |
|    |     | Production/da                                          | y Proba                       | bility                 | Prod              | uctior        | n/day            | Prob         | abilit                      | y         |           |     |     |            |
|    |     | 95                                                     | 0.0                           | 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                         |           |           |     |     |            |
|    |     |                                                        | 0.                            | 20                     | 41                | 106           | 4 - 41-          | 0.           | .60                         | 1-        |           |     |     |            |
|    |     | finished cars at                                       | the formula                   | ted ac                 | ross tr           | ne bay        | / at the         | e ena        | 01 ea                       | acn<br>bo |           |     |     |            |
|    |     | the average num                                        | the forty in                  | as spac<br>rs wait     | ing to            | he sh         | inned            | , what       | hat v                       | vill      |           |     |     |            |
|    |     | be the average n                                       | umber of e                    | empty s                | space of          | on the        | ship?            | und w        | nut v                       | • • • •   |           |     |     |            |
|    |     | e                                                      |                               | 1 2                    | 1                 | UN            | IT-V             | $\mathbf{)}$ |                             |           |           |     |     |            |
| 9  |     | A company uses                                         | s 10000 uu                    | nits per               | vear              | of an         | item             | _<br>The n   | urch                        | ase       | 12 Marks  | 14  | CO4 | PO1        |
|    |     | price is Rs.1 1                                        | per item.                     | Orde                   | ring (            | cost i        | is Rs.2          | 25 per       | r ord                       | ler.      |           | 2.  | 001 | PO2        |
|    |     | Carrying cost pe                                       | r year is 1                   | 2% of                  | the inv           | ventor        | y value          | e. Find      | 1:                          |           |           |     |     | -          |
|    |     | i) The EOQ                                             | 2                             |                        |                   |               | -                |              |                             |           |           |     |     |            |
|    |     | ii) The num                                            | ber of orde                   | ers per                | cycle.            |               |                  |              |                             |           |           |     |     |            |
|    |     | iii) If the l                                          | ead-time i                    | s 4 we                 | eks ar            | nd ass        | suming           | 50 w         | orkir                       | ng        |           |     |     |            |
|    |     | weeks pe                                               | er year, fin                  | d the re               | eorder            | point         |                  |              |                             |           |           |     |     |            |
| 10 |     | The fellowing to                                       | hla aharra                    | the isl                |                   | (C            | JK)<br>ardrala   |              | 4 <b>1</b> 0 4 <b>1</b> 0 2 |           | 12 Montra | T A | CO4 | DO1        |
| 10 |     | time estimate T                                        | he time es                    | timates                | 95 01 a<br>979 in | dave          | 01K alo          | ng wi        | un une                      |           | 12 Marks  | L4  | CO4 | PO1<br>PO2 |
| •  |     | Iob 1.2 1                                              | $\frac{10}{6}$ $\frac{11}{2}$ | $\gamma_{-\Lambda}$    | 3_5               | $\Delta_{-5}$ |                  | 67           | 7_                          | 8         |           |     |     | PO3        |
|    |     |                                                        | 6                             | 2- <del>-</del> -<br>2 | 5-5               | 2             | 1                | 2            | <u>/ л</u>                  |           |           |     |     | 105        |
|    |     | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$  | 12                            | 5                      | 11                | 6             | <u>1</u><br>Δ    | 9            | $+ \frac{4}{10}$            | <u> </u>  |           |     |     |            |
|    |     | h 15 1/                                                | 1 30                          | 8                      | 17                | 15            | 7                | 77           | 29                          |           |           |     |     |            |
|    |     | $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | r JU                          | 0<br>tworl             | 1/                | 13            | /                | 21           |                             |           |           |     |     |            |
|    |     | i) Diaw the                                            | project ne                    | iwork.                 |                   |               |                  |              |                             |           |           |     |     |            |

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- ii) Find the critical path.iii) Find the probability that the project is completed in 30 days.

CODE No.: 19MC3HS01

#### 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<br>All questions carry equal marks                                                               |            |                |       |             |  |
|               |                                                                                                                                     |            |                |       |             |  |
| 1.            | Define management. Explain basic concepts of Management. (OR)                                                                       | 12 Marks   | L1             | CO1   | PO1         |  |
| 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         |  |
| Δ             | (OR)<br>State the reasons for individual differences                                                                                | 12 Marks   | T 1            | CO1   | PO1         |  |
| т.            |                                                                                                                                     | 12 IvidiKS | LI             | COI   | 101         |  |
| 5.            | <b>UNIT-III</b><br>Define leadership. Explain any two styles of leadership.                                                         | 12 Marks   | L2             | CO3   | PO2<br>PO10 |  |
|               | (OR)                                                                                                                                |            |                |       | 1010        |  |
| 6.            | Explain the concept of attitude in detail.                                                                                          | 12 Marks   | L2             | CO3   | PO2<br>PO10 |  |
|               |                                                                                                                                     |            |                |       |             |  |
| 7.            | Identify the contemporary issues in job design.                                                                                     | 12 Marks   | L2             | CO2   | PO1<br>PO10 |  |
|               | (OR)                                                                                                                                |            |                | ~ ~ • |             |  |
| 8.            | Illustrate the factors affecting Human Resource Planning (HRP).                                                                     | 12 Marks   | L2             | CO2   | PO1<br>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         |  |
|               |                                                                                                                                     |            |                |       |             |  |

SVEC-19

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

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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<br>All questions carry equal marks                                                                                                   |                    |            |                |            |  |
|               |          |                                                                                                                                                                         |                    |            |                |            |  |
| 1.            | a)<br>b) | State the need and benefits of Data Warehouse.<br>Design and construct Data Warehouse architecture and explain<br>its components.                                       | 4 Marks<br>8 Marks | L1<br>L2   | CO1<br>CO1     | PO1<br>PO3 |  |
| •             | ,        | (OR)                                                                                                                                                                    |                    | <b>T</b> 4 | 0.01           | DO1        |  |
| 2.            | a)<br>b) | List out multidimensional database schemas.<br>Illustrate star and snow-flake schemas of multidimensional<br>database with its merits and demerits.                     | 3 Marks<br>9 Marks | LI<br>L2   | CO1<br>CO1     | PO1<br>PO3 |  |
|               |          | UNIT-II)                                                                                                                                                                |                    |            |                |            |  |
| 3.            | a)<br>b) | Identify the major issues in Data Mining<br>Write short notes on classification of data mining system.<br>(OR)                                                          | 6 Marks<br>6 Marks | L2<br>L2   | CO4<br>CO4     | PO1<br>PO1 |  |
| 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<br>item sets without candidate generation? If yes, apply the FP-<br>growth method with suitable example. | 12 Marks           | L4         | CO2            | PO5        |  |
| 6.            |          | (OR)<br>Outline the steps required to construct a decision tree in detail<br>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        |  |
| 8.            |          | (OR)<br>Apply partitioning methods to cluster the data and discuss its<br>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<br>(OR)                                                                                                                    | 6 Marks            | L2         | CO4            | PO1        |  |
| 10.           |          | Apply various methods and approaches to mine the text database.                                                                                                         | 12 Marks           | L3         | CO4            | PO5        |  |
|               |          |                                                                                                                                                                         |                    |            |                |            |  |

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## SREE VIDYANIKETHAN ENGINEERING COLLEGE

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## M.C.A. III Semester (SVEC-19) Regular Examinations February - 2021 **PYTHON PROGRAMMING**

| r  | Time: 3 hours |                                                                                                                                                                |          |    |     | Max. Marks: 60 |  |  |
|----|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----|-----|----------------|--|--|
|    |               | Answer One Question from each Unit<br>All questions carry equal marks                                                                                          |          |    |     |                |  |  |
|    |               |                                                                                                                                                                |          |    |     |                |  |  |
| 1. | a)            | Write short note on computational problem solving.                                                                                                             | 6 Marks  | L1 | CO1 | PO1            |  |  |
|    | b)            | List and explain the features of python programming language.<br>(OR)                                                                                          | 6 Marks  | L1 | CO1 | PO1            |  |  |
| 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 vear to display no of days in a given month.                                                      | 6 Marks  | L3 | CO3 | PO3            |  |  |
|    | b)            | Explain solution control statement in python with example.<br>(OR)                                                                                             | 6 Marks  | L2 | CO1 | PO1            |  |  |
| 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<br>scope using a program to calculate semester GPA and cumulative<br>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            |  |  |
|    |               |                                                                                                                                                                |          |    |     |                |  |  |
| 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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#### MCA IV Semester (SVEC-16) Supplementary Examinations February – 2021

#### SOFTWARE PROJECT MANAGEMENT

#### [Master of Computer Applications]

Max. Marks: 60

Time: 3 hours

## 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  |
| 2  | a) | List the general quality improvements with a modern process over<br>conventional process. Explain the key practices to improve software<br>quality | CO2 | 6 Marks  |
|    | b) | Describe the three generations of basic technology advancement in tools, components and processes.                                                 | CO1 | 6 Marks  |
| 3  |    | Explain the principles of conventional software engineering.                                                                                       | CO1 | 12 Marks |
| 4  |    | Elaborate on Inception and Construction life cycle phase activities.                                                                               | CO1 | 12 Marks |
| 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:<br>i) Roundtrip Engineering.<br>ii) Change Management.<br>(OR)                                                               | CO1 | 12 Marks |
| 8  | a) | Identify the roles and responsibilities in a software line-of-business                                                                             | CO2 | 6 Marks  |
|    | b) | Select appropriate tool components to automate the software development process with respect to various process workflows.                         | CO5 | 6 Marks  |
| 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 |
|    |    | \$P \\$P                                                                                                                                           |     |          |

Time: 3 hours

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

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M.Tech I Semester (SVEC-19) Regular/Supplementary Examinations, August - 2021

#### **ADVANCED ALGORITHMS**

#### [Computer Science]

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? 6 Marks L2 CO1 PO1 Discuss.
  - b) In an algorithm that tests a given integer whether prime or not, 6 Marks L3 CO1 PO2 discuss the complexity of algorithm, when iteration construct is used.

#### (OR)

2. a) Maximize total profit of only one job, which can be scheduled at 6 Marks L2 CO1 PO1 any time:

Input : Five Jobs with following deadlines and profits

| JobID | Deadline | Profit |
|-------|----------|--------|
| a     | 2        | 100    |
| b     | 1        | 19     |
| с     | 2        | 27     |
| d     | 1        | 25     |
| e     | 3        | 15     |

b) Define 0/1 Knapsack problem. How the do the control abstract of 6 Marks L3 CO1 PO2 divide and conquer will apply to the solution of 0/1 Knapsack Problem? Discuss.

# UNIT-II

- a) Discuss how the problem solving methodology "Dynamic 6 Marks L2 CO1 PO1 Programming" be selected for solving a problem. State the CO2 requirement criteria.
   b) Discuss how the Transline Schemenen method here he scheme densing (Marks L2 CO2 PO1 CO2)
  - b) Discuss how the Traveling Salesperson problem be solved using 6 Marks L3 CO2 PO1 Dynamic Programming.

#### (OR)

- 4. a) Discuss how backtracking manifests as a 'dynamic programming 6 Marks L2 CO1 PO2 problem solving methodology' in the case of *n*-queen problem. CO2
  - b) Given a set of non-negative integers, and a value sum, determine 6 Marks L3 CO2 PO2 if there is a subset of the given set with sum equal to given sum. set[] = {3, 34, 4, 12, 5, 2}, sum = 9.

#### UNIT-III

| 5. | a)                                                               | State the difference between NP, NP complete and NP-hard | 6 Marks | L2 | CO1 | PO1 |
|----|------------------------------------------------------------------|----------------------------------------------------------|---------|----|-----|-----|
|    |                                                                  | problem.                                                 |         |    | CO2 |     |
|    | b) Define polynomial reducible. Write about undecidable problem. |                                                          | 6 Marks | L3 | CO1 | PO2 |
|    |                                                                  |                                                          |         |    | CO2 |     |

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|    |    | (OR)                                                                                                                                                                                                            |         |    |            |     |
|----|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----|------------|-----|
| 6. | a) | Define set cover. How a set cover contributes to greedy method of programming methodology?                                                                                                                      | 6 Marks | L2 | CO1<br>CO2 | PO1 |
|    | b) | 'A set cover problem can overcome in approximation', discuss<br>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 <i>a</i> and any positive integer <i>n</i> , there exist unique integers <i>q</i> and <i>r</i> such that $0 \le r < n$ and $a = qn + r$ ". Discuss the properties of the said division theorem | 6 Marks | L2 | CO1<br>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-<br>pattern matching.                                                                                                                              | 6 Marks | L2 | CO1        | PO1 |
|    | b) | Write about the runs of the naïve pattern-matching algorithm for the following:                                                                                                                                 | 6 Marks | L2 | CO2        | PO1 |
|    |    | Search string : ababbaabaaab                                                                                                                                                                                    |         |    |            |     |
|    |    | Pattern string : abaa                                                                                                                                                                                           |         |    |            |     |
|    | ,  | (OR)                                                                                                                                                                                                            | () ( )  |    | 001        | DOI |
| 10 | a) | Discuss how tries contribute in string-pattern matching algorithms.                                                                                                                                             | 6 Marks | L2 | COI        | PO1 |
|    | b) | Write about randomized algorithms. How do they contribute to                                                                                                                                                    | 6 Marks | L2 | CO1        | PO1 |

obtain the optimal solutions when compared with traditional problem solving methodologies?

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M.Tech I Semester (SVEC-19) Regular/Supplementary Examinations, August - 2021

#### **ADVANCED DATA STRUCTURES**

## [Computer Science]

| T  | Max. I   | . Marks: 60                                                          |                    |      |     |      |
|----|----------|----------------------------------------------------------------------|--------------------|------|-----|------|
|    |          | Answer One Question from each Unit                                   |                    |      |     |      |
|    |          | All questions carry equal marks                                      |                    |      |     |      |
|    |          |                                                                      |                    |      |     |      |
| 1  | ``       |                                                                      | $(\mathbf{M}_{1})$ | 1.0  | 001 | DO 1 |
| 1. | a)       | Define stack and write functions to implement Push and Pop           | 6 Marks            | L2   | COI | POI  |
|    |          | operations on stack using arrays with stack full and stack empty     |                    |      |     |      |
|    |          | conditions.                                                          |                    |      |     |      |
|    | b)       | Write the functions to perform insertion and deletion in a circular  | 6 Marks            | L3   | CO1 | PO1  |
|    |          | queue and illustrate with a sample input and output.                 |                    |      |     |      |
|    |          | (OR)                                                                 |                    |      |     |      |
| 2. | a)       | Explain the algorithm to evaluate postfix expression using stack     | 6 Marks            | L3   | CO1 | PO1  |
|    |          | with an illustration.                                                |                    |      |     |      |
|    | b)       | What is the advantage of doubly linked list over singly linked list? | 6 Marks            | L2   | CO1 | PO1  |
|    |          | Illustrate with an example.                                          |                    |      |     |      |
|    |          | UNIT-II                                                              |                    |      |     |      |
| 3  | a)       | Discuss in detail about the use of maps in STL                       | 6 Marks            | L2   | CO2 | PO1  |
| 2. | h)       | List and explain the properties of B-tree                            | 6 Marks            | L2   | CO1 | PO1  |
|    | 0)       | (OR)                                                                 | 0 WILLING          | 1.14 | COI | 101  |
| Δ  | a)       | Write a short note on different tree traversal techniques            | 6 Marks            | 12   | CO1 | PO1  |
| т. | a)<br>b) | Explain the bottom up insertion procedure in the Red Black trees     | 6 Marks            | 12   | CO1 | PO1  |
|    | 0)       | with an axample                                                      | 0 WIAIKS           | L4   | COI | 101  |
|    |          |                                                                      |                    |      |     |      |
|    |          |                                                                      |                    |      |     |      |
| 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          | 6 Marks            | L2   | CO1 | PO2  |
|    |          | technique in graphs.                                                 |                    |      |     |      |
|    |          | (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        | 6 Marks            | L2   | CO1 | PO1  |
|    |          | application.                                                         |                    |      |     |      |
|    |          | (UNIT-IV)                                                            |                    |      |     |      |
| 7. | a)       | Prove that the amortized time of FIB-HEAP-EXTRACT-MIN and            | 6 Marks            | L4   | CO1 | PO2  |
|    | ,        | FIB-HEAP-DELETE is O(log n).                                         |                    |      |     |      |
|    | b)       | Analyze in detail about the applications of Priority Oueues.         | 6 Marks            | L3   | CO1 | PO2  |
|    | ,        | (OR)                                                                 |                    |      |     |      |
| 8. | a)       | Illustrate the separate chaining method of handling collision with   | 6 Marks            | L2   | CO1 | PO2  |
|    |          | an example.                                                          |                    |      |     |      |
|    | b)       | Write a short note on Hash function and Hash tables.                 | 6 Marks            | L2   | CO1 | PO1  |
|    | -)       |                                                                      |                    |      |     | _    |
| 0  | a)       | Analyze the norfermance of range correling query in a gued tree      | 6 Mortra           | τ /  | CO1 | DOJ  |
| 9. | a)       | Analyze the performance of range-searching query in a quad tree.     | O Marks            | L4   | COI | PO2  |
|    | D)       | while a short note on two different kinds of k-d trees,              | o Marks            | LZ   | 002 | POI  |
|    |          | region-based k-d trees and point-based k-d trees.                    |                    |      |     |      |
| 10 | - )      | (UK)                                                                 | $(M^{-1})$         | 1.2  | 001 |      |
| 10 | a)       | write an algorithm for two-dimensional range searching in range      | o Marks            | L3   | COI | POI  |
| •  | 1)       |                                                                      |                    | т о  | 001 | DO 1 |
|    | D)       | with a neat sketch explain the two dimensional range searching in    | 6 Marks            | L2   | COI | POI  |
|    |          | range trees.                                                         |                    |      |     |      |

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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]

| Tin | Time: 3 hours |                                                                                   |           |     |       | Max. Marks: 60 |  |  |
|-----|---------------|-----------------------------------------------------------------------------------|-----------|-----|-------|----------------|--|--|
|     |               | Answer One Question from each Unit                                                |           |     |       |                |  |  |
|     |               | All questions carry equal marks                                                   |           |     |       |                |  |  |
|     |               |                                                                                   |           |     |       |                |  |  |
| 1.  | a)            | Construct a truth table to show that $(p \land q) \rightarrow p$ is a tautology   | 6 Marks   | L3  | CO1   | PO1            |  |  |
|     | b)            | Show that $\forall x(P(x) \land O(x)) \equiv \forall xP(x) \land \forall xO(x)$   | 6 Marks   | L2  | CO1   | PO1            |  |  |
|     | - )           | (OR)                                                                              |           |     |       | -              |  |  |
| 2.  | a)            | Obtain principle disjunctive normal form of the following:                        | 6 Marks   | L2  | CO1   | PO1            |  |  |
|     |               | $p \rightarrow \{ (p \rightarrow q) \land \neg (\neg q \lor \neg q) \}.$          |           |     |       |                |  |  |
|     | b)            | Show that $R \to (S \to Q)$ , ~ $P \lor R$ and $S \Longrightarrow P \to Q$ .      | 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            | 6 Marks   | L3  | CO1   | PO1            |  |  |
|     |               | and only if $x - y$ is divisible by 3. Find elements of relation of R.            |           |     |       |                |  |  |
|     | b)            | Let $B=\{a,b,c\}$ and $A=P(B)$ be the power set of B. Draw the                    | 6 Marks   | L2  | CO1   | PO1            |  |  |
|     |               | Hasse diagram for $\subseteq$ and poset A.                                        |           |     |       |                |  |  |
| 1   | a)            | (UR)                                                                              | 6 Marka   | Т2  | CO1   |                |  |  |
| 4.  | a)            | i) $A \downarrow (B = A) = A \downarrow B$                                        | 0 IVIAIKS | LS  | COI   | rui            |  |  |
|     |               | i) $A - (B \cup C) = (A - B) \cap (A - C)$                                        |           |     |       |                |  |  |
|     | b)            | Show that the function F from $< N, + > to < N, * > defined by$                   | 6 Marks   | L2  | CO1   | PO1            |  |  |
|     | ,             | f(x) = 2X for all x belong to N is a homomorphism.                                |           |     |       |                |  |  |
|     |               | (UNIT-III)                                                                        |           |     |       |                |  |  |
| 5.  | a)            | There are 35 students and 4 teachers in a college. In how many                    | 6 Marks   | L2  | CO1   | PO1            |  |  |
|     |               | ways every student shakes hand with other students and all the                    |           |     |       |                |  |  |
|     |               | teachers.                                                                         |           |     | ~ ~ 1 |                |  |  |
|     | b)            | How many different five digit numbers can be formed from the                      | 6 Marks   | L2  | COI   | PO1            |  |  |
|     |               | algits $0, 1, 2, 3$ and $4?$                                                      |           |     |       |                |  |  |
| 6   | a)            | Prove that the order of $a$ -1 is same as the order of $a$                        | 6 Marks   | L3  | CO2   | PO1            |  |  |
| 0.  | b)            | In how many ways can you select at least one king, if you choose                  | 6 Marks   | L2  | CO2   | PO1            |  |  |
|     | ,             | five cards from a Deck of 52 cards?                                               |           |     |       |                |  |  |
|     |               | UNIT-IV)                                                                          |           |     |       |                |  |  |
| 7.  | a)            | Solve the Recurrence Relation.                                                    | 6 Marks   | L2  | CO2   | PO2            |  |  |
|     |               | $a_{n+2}^2 - 5a_{n+1}^2 + 6a_n^2 = 0, n \ge 0, a_0 = a_1 = 1$                     |           |     |       |                |  |  |
|     | b)            | Solve the Recurrence Relation $U_n + 5U_{n-1} + 5U_{n-2} = 0$ , $n \ge 0$ ,       | 6 Marks   | L2  | CO2   | PO2            |  |  |
|     |               | where the initial conditions are $U_0=0$ and $U_1=2\sqrt{5}$ .                    |           |     |       |                |  |  |
| 0   |               | (OR)                                                                              | 6 M1      | 1.2 | CON   | DO1            |  |  |
| ð.  | a)            | Solve $\sqrt{a_n} - \sqrt{a_{n-1}} - 2\sqrt{a_{n-2}} = 0$ where $a_0 = a_1 = 1$ . | o Marks   | L2  | 002   | PUI            |  |  |
|     | 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.
  - b) Using depth first search method, determine the spanning tree **T** for the following graph with the vertex *e* as the root of **T**.



#### (**OR**)

- 10 a) Let G be the non directed graph of order 9 such that each vertex 6 Marks L2 CO2 PO2
  has degree 5 or 6. Prove that atleast 5 vertices have degree 6 or atleast 6 vertices have degree 5.
  - b) Determine the number of edges in: i)  $K_n$  ii)  $K_{m,n}$  iii)  $P_n$ .

6 Marks L2 CO2 PO1

 6 Marks L2 CO2 PO1 6 Marks L4 CO2 PO2

| C  | ODE N                                                                                                                    | No.: 19MT10708          |                             |                                | Doll No              |              |            | SVI       | EC-19 |
|----|--------------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------------------|--------------------------------|----------------------|--------------|------------|-----------|-------|
|    |                                                                                                                          | SREE                    | VIDVANIKA                   | THAN ENGINE                    |                      |              |            |           |       |
|    |                                                                                                                          | (An /                   | Autonomous Inst             | itution, Affiliated to JNT     | UA, Ananthapur       | ramu)        |            |           |       |
|    | Ν                                                                                                                        | I.Tech I Semester (S    | VEC-19) Re                  | gular/Suppleme                 | ntary Exan           | ninations, A | Augus      | t 2021    |       |
|    |                                                                                                                          | I                       | RESEARCH<br>[ Com           | METHODOLOG<br>puter Science, V | GY AND IPF<br>L S I] | R            |            |           |       |
| Ti | Time: 3 hours                                                                                                            |                         |                             |                                |                      |              | Max        | . Marks:  | 60    |
|    |                                                                                                                          |                         | Answer O                    | ne Question from               | each Unit            |              |            |           |       |
|    |                                                                                                                          |                         | All que                     | stions carry equal             | l marks              |              |            |           |       |
|    |                                                                                                                          |                         |                             | UNIT-I                         |                      |              |            |           |       |
| 1. |                                                                                                                          | Discuss in detail vario | us types of re              | search designs. W              | hich factors         | 12 Marks     | L3         | CO1       | PO1   |
|    |                                                                                                                          | influence the choice of | f research des              | ign?                           |                      |              |            |           |       |
| 2  |                                                                                                                          | Diama the difference    | h atawa an                  | (OR)                           | angh ghiliter        | 12 Montra    | т э        | CO1       |       |
| ۷. |                                                                                                                          | sampling techniques     | Discuss in                  | n detail various               | types of             | 12 Marks     | L2         | COI       | POI   |
|    |                                                                                                                          | probability sampling to | echniques.                  |                                | types of             |              |            |           |       |
|    |                                                                                                                          |                         | Ĩ                           | UNIT-II                        |                      |              |            |           |       |
| 3. | 3. a) Enumerate different types of errors that may occur while 6 Ma formulating the hypothesis. Justify with an example. |                         |                             |                                |                      | 6 Marks      | L2         | CO1       | PO1   |
|    |                                                                                                                          |                         |                             |                                |                      |              |            |           |       |
|    | b)                                                                                                                       | Most graduate scho      | ols of busii<br>the Graduat | ness require app               | Admission            | 6 Marks      | L3         | CO1       | PO2   |
|    |                                                                                                                          | Council's GMAT exa      | nination Sco                | res on the GMAT                | are roughly          |              |            |           |       |
|    |                                                                                                                          | normally distributed w  | vith a mean of              | 527 and a standar              | d deviation          |              |            |           |       |
|    |                                                                                                                          | of 112. What is the p   | probability of              | an individual sco              | oring above          |              |            |           |       |
|    |                                                                                                                          | 500 on the GMAT?        |                             | $(\mathbf{OP})$                |                      |              |            |           |       |
| Δ  | a)                                                                                                                       | Justify how chi-saya    | re test can                 | (UK)<br>be used for quar       | tifving the          |              | та         | 001       | DO2   |
|    | u)                                                                                                                       | Goodness of Fit and     | enlist the p                | procedural steps i             | involved in          | o Marks      | L4         | COI       | POS   |
|    |                                                                                                                          | testing.                | 1                           | 1                              |                      |              |            |           |       |
|    | b)                                                                                                                       | The table given below   | ow shows th                 | ne data obtained               | during an            | 6 Marks      | L3         | CO1       | PO2   |
|    |                                                                                                                          | epidemic of cholera:    | Attackad                    | Not attacked                   | Tatal                |              |            |           |       |
|    |                                                                                                                          | Inoculated              | 31                          | 469                            | 500                  |              |            |           |       |
|    |                                                                                                                          | Not inoculated          | 185                         | 1315                           | 1500                 |              |            |           |       |
|    |                                                                                                                          | Total                   | 216                         | 1784                           | 2000                 |              |            |           |       |
|    |                                                                                                                          | Test the effectiveness  | of Inoculatio               | n in preventing ch             | olera using          |              |            |           |       |
|    |                                                                                                                          | chi-square test.        |                             |                                |                      |              |            |           |       |
| 5  | a)                                                                                                                       | Is it passage to prod   | tion othios in              | research If yes                | instify your         |              | <b>T</b> 4 | <b>GO</b> | DOC   |
| 5. | aj                                                                                                                       | answer with the ethic   | s that should               | be followed whil               | e leading a          | 6 Marks      | L4         | CO2       | PO6   |
|    |                                                                                                                          | research.               |                             |                                | <b> -</b>            |              |            |           |       |
|    | b)                                                                                                                       | Explain the significant | nce of a rese               | earch report and               | narrate the          | 6 Marks      | L2         | CO2       | PO5   |
|    |                                                                                                                          | various steps involved  | in writing su               | ch a report.                   |                      |              |            |           |       |

(OR)

| 6. | a) | Write a brief note on the ' <i>task of interpretation</i> ' in the context of research methodology.                                             | 6 Marks  | L3 | CO2 | PO5 |
|----|----|-------------------------------------------------------------------------------------------------------------------------------------------------|----------|----|-----|-----|
|    | b) | Mention the different types of reports, particularly pointing out<br>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 |
| 8. |    | Discuss the importance of intellectual property rights.                                                                                         | 12 Marks | L2 | CO3 | PO6 |
| 9. |    | What is copyright? Why should copyright be protected? What are<br>the classes of works for which copyright protection is available<br>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

Time: 3 hours

## 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

#### [VLSI]

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.  $M_{1} V_{DD}$   $V_{in} \circ V_{out}$   $V_{out} \circ V_{DD}$ 

|    | b)       | Explain about cascode stage amplifier with resistive load.                                                                                       | 7 Marks            | L1       | CO1        | PO1        |
|----|----------|--------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------|------------|------------|
| 2. | a)<br>b) | Illustrate how a MOS transistor can act like current source.<br>Develop the large signal model for CG Configuration with necessary equations     | 5 Marks<br>7 Marks | L2<br>L3 | CO1<br>CO1 | PO1<br>PO2 |
|    |          | UNIT-II                                                                                                                                          |                    |          |            |            |
| 3. | a)<br>b) | Compare allowable voltages in a cascode with resistive load.<br>Demonstrate the shielding property of cascode stage amplifier.                   | 6 Marks<br>6 Marks | L2<br>L2 | CO1<br>CO1 | PO1<br>PO1 |
|    |          | (OR)                                                                                                                                             |                    |          |            |            |
| 4. | a)<br>b) | Explain the effect of Noise in source follower.<br>Develop a differential pair with current source as a load and<br>show the frequency response. | 5 Marks<br>7 Marks | L2<br>L3 | CO1<br>CO1 | PO1<br>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-<br>stage op-amps.                                                                | 7 Marks            | L3       | CO2        | PO2        |
|    | b)       | Define the following:<br>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        |
| 0  | a)       | (OR)                                                                                                                                             | 6 Marka            | T 1      | CO3        |            |
| 0. | a)       | i) Supply-Independent Biasing ii) Phase Margin.                                                                                                  | UIVIAIKS           | LI       | 003        | rui        |
|    | b)       | Classify the temperature independent references.                                                                                                 | 6 Marks            | L2       | CO3        | PO1        |
|    |          |                                                                                                                                                  |                    |          |            |            |

**SVEC-19** 

5 Marks L2 CO1

PO1

#### 

| 9.  | a) | Explain Charge                                                   | Injection      | Cancellation     | and  | precision | 7 Marks | L2 | CO4 | PO1 |
|-----|----|------------------------------------------------------------------|----------------|------------------|------|-----------|---------|----|-----|-----|
|     |    | consideration in Sam                                             | pling Switcl   | nes.             |      |           |         |    |     |     |
|     | b) | b) Show the equivalent circuit of non inverting amplifier during |                |                  |      |           |         | L2 | CO4 | PO1 |
|     |    | precision considerati                                            | on in switch   | ed capacitor.    |      |           |         |    |     |     |
|     |    |                                                                  |                | (OR)             |      |           |         |    |     |     |
| 10. | a) | Explain the basic PL                                             | L technolog    | у.               |      |           | 5 Marks | L2 | CO4 | PO1 |
|     | b) | Explain switched cap                                             | pacitor circui | t and its princi | ple. |           | 7 Marks | L2 | CO4 | PO1 |

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SVEC-19

# SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.Tech I Semester (SVEC-19) Regular/Supplementary Examinations, August - 2021

## **DEVICE MODELING**

## [VLSI]

| Time: 3 hours |         |                                                                                                                                                                          |             |       |     | Max. Marks: 60 |  |  |  |
|---------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------|-----|----------------|--|--|--|
|               |         | Answer One Question from each Unit                                                                                                                                       |             |       |     |                |  |  |  |
|               |         | All questions carry equal marks                                                                                                                                          |             |       |     |                |  |  |  |
|               |         |                                                                                                                                                                          |             |       |     |                |  |  |  |
| 1.            | a)      | Write in detail about potential balance and charge balance of two<br>terminal MOS structure                                                                              | 6 Marks     | L1    | CO1 | PO1            |  |  |  |
|               | b)      | Categorize the different Regions of inversions in MOS structure.                                                                                                         | 6 Marks     | L4    | CO1 | PO1            |  |  |  |
| 2             | a)      | Explain in detail about ninch-off voltage and body effect                                                                                                                | 6 Marks     | L2    | CO1 | PO1            |  |  |  |
| 2.            | h)      | Show the CV characteristics of a MOS structure                                                                                                                           | 6 Marks     | $L_2$ | CO1 | PO1            |  |  |  |
|               | 0)      | UNIT-II                                                                                                                                                                  | 0 101001115 |       | 001 | 101            |  |  |  |
| 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<br>weak inversion with VGS as a parameter and explain the<br>comparison to weak and strong inversion equations | 6 Marks     | L1    | CO1 | PO1            |  |  |  |
|               | h)      | Compare and contrast the regions of operation of a transistor                                                                                                            | 6 Marks     | 12    | CO1 | PO1            |  |  |  |
|               | 0)      | UNIT-III                                                                                                                                                                 |             |       | COI | 101            |  |  |  |
| 5.            | a)      | Show the structure of LOCUS isolated MOSFET and explain.                                                                                                                 | 8 Marks     | L1    | CO2 | PO1            |  |  |  |
|               | b)      | Explain:                                                                                                                                                                 | 4 Marks     | L2    | CO2 | PO1            |  |  |  |
|               | ,       | i) Break down in MOS. ii) Effective threshold voltage. <b>(OR)</b>                                                                                                       |             |       |     |                |  |  |  |
| 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                                                                                                           | 6 Marks     | L3    | CO3 | PO1            |  |  |  |
|               | 1 \     | static operation under DC excitation.                                                                                                                                    |             | т о   | 001 | DO 1           |  |  |  |
|               | b)      | Explain the evaluation of charges in strong inversion for non-<br>saturation with necessary expressions.                                                                 | 6 Marks     | L2    | 03  | POI            |  |  |  |
|               |         | (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<br>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            |  |  |  |
|               |         | -<br>& & &                                                                                                                                                               |             |       |     |                |  |  |  |

Time: 3 hours

SVEC-19
Roll No.

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.Tech I Semester (SVEC-19) Regular/Supplementary Examinations, August - 2021

## DIGITAL CMOS VLSI DESIGN

#### [VLSI]

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<br>the conscitutes and propagation delay | 7 Marks   | L2 | CO1 | PO1 |
|-----|----|--------------------------------------------------------------------------------------------------------|-----------|----|-----|-----|
|     | h) | Survey the leakage issues in dynamic CMOS circuits                                                     | 5 Marks   | 14 | CO1 | PO1 |
|     | 0) | (OR)                                                                                                   | J WILLING | LT | COI | 101 |
| 2.  | a) | Let $Z = (ABCDE + FGH)'$ . Develop a BiCMOS and Domino                                                 | 6 Marks   | L4 | CO1 | PO2 |
|     |    | CMOS implementation of the Boolean function Z.                                                         |           |    |     |     |
|     | 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. <b>(OR)</b>                         | 7 Marks   | L1 | CO3 | PO1 |
| 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. <b>(OR)</b>                                | 7 Marks   | L1 | CO3 | PO1 |
| 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 |
| 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<br>enhancement of digital circuits.  | 6 Marks   | L2 | CO4 | PO1 |

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Time: 3 hours

Roll No.

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.Tech I Semester (SVEC-19) Regular/Supplementary Examinations, August – 2021

IC FABRICATION

[VLSI]

Max. Marks: 60

SVEC-19

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

# UNIT-I

| 1.  | a)<br>b) | Describe in detail evaluation of epitaxial thickness and doping.<br>Compare the merits and demerits of MBE (Molecular Beam                                                                                                        | 6 Marks<br>6 Marks | L2<br>L4 | CO1<br>CO1 | PO1<br>PO1 |
|-----|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------|------------|------------|
|     |          | (OR)                                                                                                                                                                                                                              |                    |          |            |            |
| 2   | a)       | Define oxidation                                                                                                                                                                                                                  | 3 Marks            | L1       | CO1        | PO1        |
|     | b)       | Explain and justify the oxidation induced defects.                                                                                                                                                                                | 4 Marks            | L2       | COI        | PO1        |
|     | c)       | List the rules to maintain clean room and its safety.                                                                                                                                                                             | 5 Marks            | L1       | CO1        | PO1        |
|     | ,        |                                                                                                                                                                                                                                   |                    |          |            |            |
| 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 :                                                                                                                                                                                                          | 6 Marks            | L2       | CO1        | PO1        |
|     |          | i) X-ray Lithography. ii) Anisotropy etch mechanism.                                                                                                                                                                              |                    |          |            |            |
|     |          | 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        |
| 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<br>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 $\mu$ m thick SiO <sub>2</sub> . The polysilicon has a resistance of 5000 $\Omega$ and a resistivity $\rho$ of 1000 $\mu\Omega$ /cm. | 4 Marks            | L5       | CO2        | PO1        |
| 9   | a)       | Memorize the concept of "beam specimen interactions that the                                                                                                                                                                      | 6 Marks            | L1       | CO3        | PO1        |
|     | )        | analytical beams with materials".                                                                                                                                                                                                 | ~                  |          | 200        | - 01       |
|     | 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        |

Roll No.

# SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.Tech I Semester (SVEC-19) Regular/Supplementary Examinations August - 2021

# **FPGA ARCHITECTURES**

[VLSI]

| Ti     | me: 3    | hours<br>Answer One Question from each Unit<br>All questions carry equal marks | Max. Marks: 60 |          |              |            |  |  |  |
|--------|----------|--------------------------------------------------------------------------------|----------------|----------|--------------|------------|--|--|--|
|        |          |                                                                                |                |          |              |            |  |  |  |
| 1      | 0)       | <b>UNIT-I</b>                                                                  | 7 Mortra       | т 1      | CO1          | DO1        |  |  |  |
| 1.     | a)<br>b) | Implement a combinational circuit using any one of the                         | 5 Marks        | L1<br>L4 | CO1          | PO1<br>PO2 |  |  |  |
|        | ,        | programmable logic devices.                                                    |                |          |              |            |  |  |  |
| 2      |          | ( <b>OR</b> )<br>Summarize the complex programmable logic devices and          | 12 Marks       | 14       | CO1          | PO1        |  |  |  |
|        |          | discuss.                                                                       |                | 2.       | 001          | 101        |  |  |  |
|        |          | (UNIT-II)                                                                      |                |          |              |            |  |  |  |
| 3.     | a)       | Draw and explain Configurable Logic Block of Xilinx XC 3000                    | 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 Next State for Next State for                                          |                |          |              |            |  |  |  |
|        |          | State Input 0 Input 1                                                          |                |          |              |            |  |  |  |
|        |          | $Q_0$ $Q_1, Q_2$ $Q_1$                                                         |                |          |              |            |  |  |  |
|        |          | Q <sub>1</sub> Q <sub>2</sub> Q <sub>3</sub>                                   |                |          |              |            |  |  |  |
|        |          | $Q_2$ $Q_1$ $Q_3$                                                              |                |          |              |            |  |  |  |
|        |          | Q <sub>3</sub> Q <sub>2</sub> Q <sub>2</sub>                                   |                |          |              |            |  |  |  |
|        | b)       | Discuss in detail about state diagram symbols and components.                  | 6 Marks        | L4       | CO3          | PO1        |  |  |  |
| _      |          | UNIT-IV                                                                        | 10.14          |          | <b>a a i</b> |            |  |  |  |
| 7.     |          | Design a data path bus using One-hot method.<br>(OR)                           | 12 Marks       | L3       | CO4          | PO2        |  |  |  |
| 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        |  |  |  |
Roll No.

#### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.Tech I Semester (SVEC-19) Regular/Supplementary Examinations August - 2021

## **CLOUD COMPUTING**

[ Computer Science] Time: 3 hours Max. Marks: 60 **Answer One Question from each Unit** All questions carry equal marks UNIT-I 6 Marks 1. Explain the virtualization process involved in Amazon Web L2 CO<sub>2</sub> PO1 a) Services. CO<sub>2</sub> b) Compare Grid computing and Cloud computing. 6 Marks L2 PO1 (**OR**) 2. a) Examine how VMware turned as a pioneer in the commercial 6 Marks L4 CO1 PO2 market of virtualization as a service provider. Compare Type-I and Type-II Hypervisors. b) 6 Marks L2 CO1 PO1 UNIT-II ) 3. a) Explain the risks and challenges of using cloud environment. 6 Marks L2 CO1 **PO1** Distinguish public cloud and private cloud model used for 6 Marks L2 CO<sub>2</sub> PO1 b) deployment. (**OR**) Examine the need for combining Infrastructure as a Service, 4. a) 6 Marks L4 CO<sub>2</sub> PO<sub>2</sub> Platform as a Service and Software as a Service. Explain the threat agents that can be considered while building b) 6 Marks L2 CO<sub>2</sub> PO1 cloud environment. (UNIT-III) Explain the basic services provided in cloud environment. 6 Marks 5. a) L2 CO<sub>2</sub> PO1 b) Model user authentication in Identity as a Service. Discuss with 6 Marks L3 CO2 PO<sub>2</sub> an example. (**OR**) Outline the characteristics of Platform as a Service in cloud. 6. a) 6 Marks L2 CO<sub>2</sub> PO1 Distinguish the characteristics of Platform as a Service and b) 6 Marks L2 CO<sub>2</sub> PO1 Software as a Service models with respect to specific cloud service providers. UNIT-IV Identify a suitable reference model for workflow management CO2 7. a) 6 Marks L3 PO2 system. b) Explain the characteristics of Message Passing Interface. 6 Marks L2 CO<sub>2</sub> PO1 (**OR**) Explain the additional properties of application model with CO2 8. 6 Marks L2 PO1 a) respect to embarrassingly parallel application. Summarize the achievement of using throughput computing to L2 CO<sub>2</sub> PO1 b) 6 Marks create a cloud environment. UNIT-V Explain the types of services provided by Microsoft Azure. 9. a) 6 Marks L2 CO<sub>2</sub> PO1 Outline the architecture for SQL Azure. 6 Marks b) L2 CO2 PO1 (**OR**) Explain the storage service provided through Amazon S3. 6 Marks L2 CO<sub>2</sub> PO1 10 a) Identify the energy management aspects used to build cloud 6 Marks L3 CO2 PO<sub>2</sub> b) environment in GoogleApp engine. ද්ම <u>(</u> (R)

SVEC-19
Roll No.

# SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

M.Tech I Semester (SVEC-19) Regular/Supplementary Examinations, August - 2021

### WIRELESS SENSOR NETWORKS

[ Computer Science ]

| Time: 3 hours |          |                                                                                                                            |                    |          | Max. Marks: 60 |            |  |  |  |  |
|---------------|----------|----------------------------------------------------------------------------------------------------------------------------|--------------------|----------|----------------|------------|--|--|--|--|
|               |          |                                                                                                                            |                    |          |                |            |  |  |  |  |
|               |          |                                                                                                                            |                    |          |                |            |  |  |  |  |
| 1.            | a)       | What is a wireless sensor network? What are the characteristic                                                             | 6 Marks            | L2       | CO1            | PO2        |  |  |  |  |
|               | b)       | List different sensor classifications in wireless sensor network.                                                          | 6 Marks            | L2       | CO1            | PO2        |  |  |  |  |
| 2.            | a)       | (OR)<br>What is the difference between passive and active sensors and                                                      | 6 Marks            | L2       | CO1            | PO1        |  |  |  |  |
|               | b)       | list a few examples for each category.<br>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        |  |  |  |  |
| 4.            | a)       | Discuss about Traffic-Adaptive Medium Access contention free                                                               | 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        |  |  |  |  |
| 7.            |          | Explain different types of security attacks in wireless sensor                                                             | 12 Marks           | L2       | CO1            | PO1        |  |  |  |  |
|               |          | network.                                                                                                                   |                    |          |                |            |  |  |  |  |
| 0             | ``       |                                                                                                                            |                    | T 2      | 002            | DOO        |  |  |  |  |
| 8.            | a)<br>b) | Explain Localized Encryption and Authentication Protocol for                                                               | 6 Marks<br>6 Marks | L2<br>L2 | CO2<br>CO2     | PO2<br>PO2 |  |  |  |  |
|               |          |                                                                                                                            |                    |          |                |            |  |  |  |  |
| 0             |          |                                                                                                                            |                    |          | 0.01           | DOI        |  |  |  |  |
| 9.            | a)       | Explain real life deployment related to wireless sensor networks in detail.                                                | 6 Marks            | L2       | COI            | POI        |  |  |  |  |
|               | 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        |  |  |  |  |
|               |          | \$P \$P \$P                                                                                                                |                    |          |                |            |  |  |  |  |

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# SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

| MEMORY | TECHNOLOGIES |
|--------|--------------|
|        |              |

| [ V L S I ] |  |
|-------------|--|
|-------------|--|

Max. Marks: 60

| Time: 3 hours |          |                                                                                                               | Max. Marks: 60     |          |            |            |
|---------------|----------|---------------------------------------------------------------------------------------------------------------|--------------------|----------|------------|------------|
|               |          |                                                                                                               |                    |          |            |            |
|               |          | All questions carry equal marks                                                                               |                    |          |            |            |
|               |          |                                                                                                               |                    |          |            |            |
| 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        |
| 2.            | a)<br>b) | Demonstrate Three Transistor DRAM cell with neat sketch.<br>Construct a simple Trench cell structure of DRAM. | 6 Marks<br>6 Marks | L3<br>L3 | CO1<br>CO1 | PO1<br>PO1 |
| 3.            | a)<br>b) | Write short notes on CMOS PROMs.<br>Explain FLOTAX technology with neat sketch.                               | 6 Marks<br>6 Marks | L1<br>L2 | CO1<br>CO1 | PO1<br>PO1 |
| 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        |
| 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<br>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        |
| 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        |
|               |          |                                                                                                               |                    |          |            |            |

Identify the functional faults usually occur in nonvolatile 4 Marks b) L1 CO4 PO1 memory modeling.

Time: 3 hours

### SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

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

NANO MATERIALS AND NANOTECHNOLOGY

[VLSI]

Max. Marks: 60

#### **Answer One Question from each Unit** All questions carry equal marks UNIT-I Define intrinsic and extrinsic size effects. 1. 5 Marks L1CO1 PO1 a) Illustrate the different properties of nano particles to the same b) 7 Marks L2 CO1 PO1 materials in bulk. (**OR**) 2. Demonstrate the Gleiter's classification strategy of nanostructures 12 Marks L3 CO1 **PO1** materials. UNIT-II ) 3. Interpret the principal working and application of transmission 12 Marks L2 CO1 PO1 electron microscopy for the characterization of nano materials. (OR)Identify the role of nano scale dimension on the physical 6 Marks 4. L3 CO1 PO1 a) properties of Nano materials (Melting points and lattice constants) of materials. Solve the mean size of a nano crystallites (nm), where, crystallite 6 Marks b) L3 CO1 PO1 shape factor a good approximation is 0.9, 1.54060 Å is the X-ray wavelength, 0.5 angle ( $\theta$ ) is the full width at half the maximum (FWHM) of the X-ray diffraction peak and the Braggs' angle is 10 deg. (UNIT-III) 5. Relate the application and advantages of MEMS in the current 12 Marks L1 CO<sub>2</sub> PO1 technology. (**OR**) Summarize different fabrication steps to develop MEMS based 6 Marks L2 CO<sub>2</sub> **PO2** 6. a) structure such cantilever. b) Contrast the concept MEMS and NEMS with respect to their 6 Marks L4 CO<sub>2</sub> PO1 design and applications. UNIT-IV) 7. a) Outline the semiconducting and metallic properties of CNT 6 Marks L2 CO3 PO1 based on chiral indices (n, m). b) Construct the flowchart of one of the growth methods of Carbon 6 Marks L3 CO3 PO1 Nano tubes. (**OR**) Analyze and contribute views on versatile applications of CNTs 8. 12 Marks L4 CO3 PO1 in multidisciplinary research in nanotechnology. UNIT-V 9. Identify working principle of a nanodevice for biological 12 Marks L3 CO3 **PO2** applications of Nano particles. (**OR**) Analyze different quantum devices considering the synthetic CO<sub>4</sub> PO1 10 a) 6 Marks I.4 tailoring of band gaps. Illustrate the catalysis by gold nano particles. PO1 b) 6 Marks L2 CO4 ନ୍ଦେ (j) (j)