

29/12/22
FN

Q.P. Code: 18HS0830

R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations Dec 2021/ January 2022
MATHEMATICS - I
(Common to All Branches)

Time: 3 hours

Max. Marks: 60

PART-A
(Compulsory Questions)

Answer the following; (5 X 2 = 10 Marks)

- | | | | |
|--------|---|----|-----|
| 1. (a) | Define symmetric and skew-symmetric matrices. | L1 | 2 M |
| (b) | State Rolle's theorem & Lagrange's mean value theorems. | L1 | 2 M |
| (c) | List the stationary points of the function $f(x, y) = x^3 + y^3 - 3axy$. | L3 | 2 M |
| (d) | State Cauchy's n^{th} root test for the convergence of a series. | L2 | 2 M |
| (e) | If $f(x) = 1 - x^2$ in $[-1, 1]$, then find the Fourier constant a_0 | L3 | 2 M |

PART- B

(Answer all five units, 5 x 10 =50 Marks)

UNIT - I

- | | | | |
|----|--|----|------|
| 2. | Show that the matrix $A = \begin{bmatrix} 1 & -2 & 2 \\ 1 & -2 & 3 \\ 0 & -1 & 2 \end{bmatrix}$ satisfies its characteristics equation | L3 | 10 M |
|----|--|----|------|

OR

- | | | | |
|----|---|----|------|
| 3. | Diagonalise the matrix $A = \begin{bmatrix} 1 & 1 & 1 \\ 0 & 2 & 1 \\ -4 & 4 & 3 \end{bmatrix}$ | L3 | 10 M |
|----|---|----|------|

UNIT - II

- | | | | |
|----|---|----|------|
| 4. | Find the volume of the solid generated by revolving the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ about the major axis. | L1 | 10 M |
|----|---|----|------|

OR

- | | | | |
|----|---|----|------|
| 5. | Evaluate the integral $\int_0^1 x^2 \left(\log \frac{1}{x}\right)^3 dx$ using Gamma function. | L1 | 10 M |
|----|---|----|------|

UNIT - III

- | | | | |
|----|---|----|------|
| 6. | If $u = \frac{1}{\sqrt{x^2+y^2+z^2}}$, $x^2 + y^2 + z^2 \neq 0$ then show that $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2} = 0$ | L3 | 10 M |
|----|---|----|------|

OR

- | | | | |
|----|---|----|------|
| 7. | Find the directional derivative of the function $f = x^2 - y^2 + 2z^2$ at the point $P = (1, 2, 3)$ in the direction of the line PQ , where $Q = (5, 0, 4)$ | L3 | 10 M |
|----|---|----|------|

UNIT - IV

- | | | | |
|----|--|----|------|
| 8. | Discuss the convergence of the series $\sum \left(\frac{x^n}{n!}\right)$ for all values of x | L2 | 10 M |
|----|--|----|------|

OR

- | | | | |
|----|---|----|------|
| 9. | Test the convergence of the series (a). $\sum \left\{ \frac{1}{\sqrt{n} + \sqrt{n+1}} \right\}$, (b). $\sum \left\{ \frac{2n-1}{n(n+1)(n+2)} \right\}$ | L2 | 10 M |
|----|---|----|------|

UNIT - V

- | | | | |
|-----|---|----|------|
| 10. | Expand $f(x) = x $ as a Fourier series in $-2 < x < 2$ | L4 | 10 M |
|-----|---|----|------|

OR

- | | | | |
|-----|---|----|------|
| 11. | Expand $f(x) = x(\pi - x)$ as Fourier half range sine series in $0 \leq x \leq \pi$ | L4 | 10 M |
|-----|---|----|------|

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Q.P. Code: 18HS0801

R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations Dec-2021/January 2022
CHEMISTRY
(Common to ECE & CSE)

Time: 3 hours

Max. Marks: 60

PART-A

(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)

- | | | |
|---|----|----|
| (a) Define oxidation state with suitable example. | L2 | 2M |
| (b) Write the Nernst equation. | L1 | 2M |
| (c) What are inhibitors? Give an example. | L2 | 2M |
| (d) What is substitution reaction? Give an example. | L2 | 2M |
| (e) Write the applications of flame photometry. | L3 | 2M |

PART-B

(Answer all five units, 5 x 10 = 50 Marks)

UNIT - I

- | | | |
|---|----|-----|
| 2. What is effective nuclear charge? Explain the variations of s, p, d and f orbital energies of atoms in periodic table. | L2 | 10M |
|---|----|-----|

OR

- | | | |
|---|----|----|
| 3. (a) Write the silent features of crystal field theory. Explain the d-orbital's splitting in tetrahedral complexes. | L2 | 5M |
| (b) Explain the molecular orbital theory with suitable diatomic molecule. | L2 | 5M |

UNIT - II

- | | | |
|---|----|-----|
| 4. Define corrosion. Describe the factors affecting the corrosion rate. | L2 | 10M |
|---|----|-----|

OR

- | | | |
|--|----|-----|
| 5. Describe the cathodic protection in detail. | L2 | 10M |
|--|----|-----|

UNIT - III

- | | | |
|---|----|-----|
| 6. What is meant by hardness of water? Explain the estimation of hardness by EDTA method. | L2 | 10M |
|---|----|-----|

OR

- | | | |
|--|----|----|
| 7. (a) Write short note on caustic embrittlement. | L2 | 5M |
| (b) Define desalination of water. Explain the desalination of brackish water by reverse osmosis. | L2 | 5M |

UNIT - IV

- | | | |
|--|----|-----|
| 8. Write the preparation, properties and engineering applications of Bakelite. | L3 | 10M |
|--|----|-----|

OR

- | | | |
|--|----|-----|
| 9. What are conducting polymers? Explain the conduction mechanism of poly acetylene. | L2 | 10M |
|--|----|-----|

UNIT - V

- | | | |
|--|----|----|
| 10. (a) Explain the principle and applications of infrared spectroscopy. | L3 | 5M |
| (b) Write short note on SEM. | L2 | 5M |

OR

- | | | |
|---|----|-----|
| 11. Explain the principle and applications of UV-Visible spectroscopy | L3 | 10M |
|---|----|-----|

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B. Tech I Year I Semester (R18) Supplementary Examinations January 2022
ENGINEERING GRAPHICS & DESIGN
(Common to ECE & CSE)

Time: 3 hours

Max Marks: 60

PART - A

(Answer all five units, 5 x 12 = 60 Marks)

- UNIT - I**
- (a) Draw an ellipse having major axis is equal to 100 mm and the minor axis is equal to 70 mm. Use the concentric circle method.
(b) Draw a parabola having a distance of 50 mm between the focus and directrix. Draw a normal and tangent to the parabola at a point 35 mm from the focus.
 - A point P is 30 mm and 50 mm respectively from two straight lines which are inclined at 75 degree to each other. Draw the rectangular hyperbola from p within 10 mm distance from each line.
 - Draw the projections of a straight line AB of 70 mm long, in the following positions:
a) perpendicular to HP, 30 mm in front of VP and one end 25 mm above HP
b) Perpendicular to HP, 30 mm in front of VP and one end on HP
c) Perpendicular to HP and in VP and one end on HP
- OR**
- UNIT - II**
- Draw the projections of the following points on a common reference line:
A, 25mm above the HP and 35mm in front of the VP
B, 25mm above the HP and 40mm behind the VP
C, 30mm below the HP and 40mm behind the VP
D, 30mm below the HP and 35mm in front of the VP
E, 25mm above the HP and in the VP
F, 30mm below the HP and in the VP
G, 35mm in front of the VP and in the HP
H, 40mm behind the VP and in the HP
- UNIT - III**
- A hexagonal pyramid of a base edge 20 mm and altitude 50 mm rests on one of its base edges on the HP such that the slant face (triangular surface) containing the resting edge is perpendicular to the HP. The resting edge is inclined at 45° to the VP. Draw the projections of the pyramid.

- A square pyramid, base 40 mm side and axis 70 mm long, is freely

suspended from one of the corners of its base. Draw its projections, when the axis as a vertical plane makes an angle of 45° with the VP.

UNIT - IV

- A square prism of side of base 40 mm and axis 80 mm long, is resting on its base on HP such that, a rectangular face of it is parallel to VP. Draw the development of the prism.
- A cone of base 50 mm diameter and height 65 mm rests with its base on HP. A section plane perpendicular to VP and inclined at 30 degree to HP bisects the axis of the cone. Draw the development of the lateral surface of the truncated cone.
- Draw the isometric projection of a pentagonal prism of base side 35 mm and axis 60mm. The prism rests on its base on the HP with an edge of the base parallel to the VP.
- Draw the isometric projection of the frustum of a hexagonal pyramid of base side 40 mm, top side 25mm, and height 70mm. The frustum rests on the HP.

6/1/22 F.V.

Q.P. Code: 18CE0101

R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester (R18) Supplementary Examinations DEC 2021
ENGINEERING MECHANICS
(Common to CE & MECH)

Time: 3 hours

Max.Marks: 60

PART-A
(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)

- | | | |
|--------------------------------------|----|----|
| (a) State the Lami's theorem. | L1 | 2M |
| (b) Define Kinetic Friction. | L1 | 2M |
| (c) Define Co-efficient of Friction. | L1 | 2M |
| (d) What is a cantilever truss. | L1 | 2M |
| (e) What is meant by perfect frame. | L1 | 2M |

PART-B
(Answer all five units, 5 x 10 = 50 Marks)

UNIT - I

- | | | |
|---|----|----|
| 2. State and prove parallelogram law of forces. | L1 | 5M |
| Classify different system of forces with suitable examples. | L2 | 5M |

OR

- | | | |
|--|----|-----|
| 3. State and prove Varignon's theorem. | L1 | 10M |
|--|----|-----|

UNIT - II

- | | | |
|--|----|-----|
| 4. A body, resting on a rough horizontal plane, required a pull of 180 N inclined at 30° to the plane just to move it. It was found that a push of 220 N inclined at 30° to the plane just moved the body. Determine the weight of the body and the coefficient of friction. | L3 | 10M |
|--|----|-----|

OR

- | | | |
|---|----|-----|
| 5. A ladder 5 meters long rests on a horizontal ground and leans against a smooth vertical wall at an angle 70° with the horizontal. The weight of the ladder is 900 N and acts at its middle. The ladder is at the point of sliding, when a man weighing 750N stands on a rung 1.5 metre from the bottom of the ladder. Calculate the coefficient of friction between the ladder and the floor. | L3 | 10M |
|---|----|-----|

UNIT - III

- | | | |
|--|----|-----|
| 6. Find the centre of gravity of a channel section 100 mm x 50 mm x 15 mm as shown in Fig.18 | L5 | 10M |
|--|----|-----|

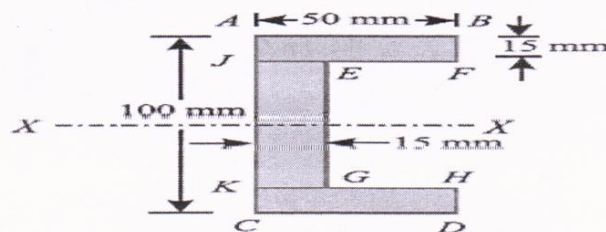


Fig.18

OR

7. Find the centre of gravity of the shaded area shown in below Fig.20 with reference to X-Y co-ordinate system. L5 10M

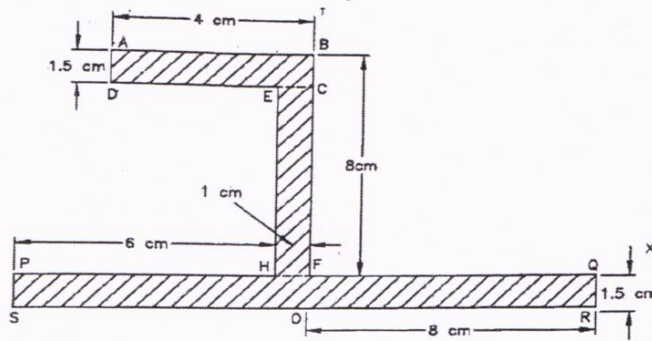


Fig.20

UNIT - IV

8. Prove the parallel axis theorem in the determination of moment of inertia of areas with the help of a neat sketch. L3 10M

OR

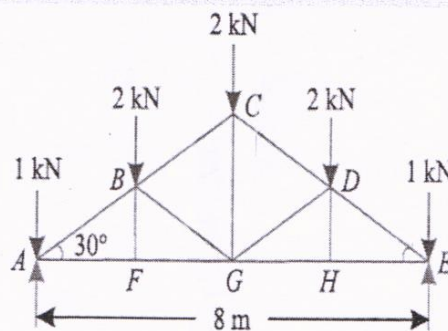
9. Derive an equation for moment of inertia of the following sections about centroidal axis:
 a) A rectangular section b) A triangular section from its base L5 10M

UNIT - V

10. Explain the procedure to find forces in members of truss by using method of joints. L3 10M

OR

11. A king post truss of 8 m span is loaded as shown in Fig.33. Find the forces in each member of the truss and tabulate the results. L4 10M



SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech I Year I Semester Supplementary Examinations Dec 2021/ January 2022

ALGEBRA & CALCULUS
(COMMON TO ALL BRANCHES)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- 1 a) Reduce the matrix $\begin{bmatrix} 1 & 2 & 3 \\ 3 & 4 & 5 \\ 2 & 6 & 5 \end{bmatrix}$ to normal form and hence find the rank. L1 6M
- b) Solve $4x+2y+z+3w=0, 6x+3y+4z+7w=0, 2x+y+w=0$ L3 6M

OR

- 2 Find the Eigen values & Eigen vectors of the matrix $\begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$ L2 12M

UNIT-II

- 3 Verify Roll's theorem for $f(x) = (x-a)^m(x-b)^n$ on $[a, b]$ $b > a; m \& n \in \mathbb{Z}^+$ L2 12M
- OR
- 4 a) Expand $f(x) = e^{\sin^{-1}x}$ in McLaurin's series L2 6M
- b) Find the Taylor's series expansion of e^x about $x = -1$ L1 6M

UNIT-III

- 5 If $u = xy + yz + zx, v = x^2 + y^2 + z^2, w = x + y + z$, find $\frac{\partial(u,v,w)}{\partial(x,y,z)}$ L2 12M
- OR
- 6 Find the volume of the largest rectangular parallelepiped that can be inscribed in the ellipsoid $\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$ L3 12M

UNIT-IV

- 7 a) Evaluate $\int_a^{2a} \int_0^{\sqrt{2ax-x^2}} xy \, dy \, dx$ L1 5M
- b) Evaluate $\int_{-1}^1 \int_{x-z}^{x+z} \int_{-1}^1 (x+y+z) \, dx \, dy \, dz$ L1 7M
- OR
- 8 Evaluate $\iint_R xy \, dx \, dy$ where R is the region bounded by X-axis, $x=2a$ and the curve $x^2 = 4ay$ L2 12M

UNIT-V

- 9 State and Prove the Relation between Beta and Gamma function L2 12M
- OR
- 10 a) Evaluate i) $\int_0^\infty e^{-x^2} x^4 \, dx$ ii) Evaluate $\int_0^\infty e^{-x^3} x^{\frac{1}{2}} \, dx$ L2 6M
- b) Evaluate $\int_0^2 x(8-x^3)^{\frac{1}{2}} \, dx$ L2 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech I Year I Semester Supplementary Examinations Dec-2021/January 2022

ADVANCED PHYSICS

(MECH)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- 1 (a) How multi colors on thin films? L1 6M
(b) Derive the condition for bright and dark fringes through the interference in thin 8 M films by reflection? L5 6M

OR

- 2 (a) Distinguish between interference and diffraction? L5 6M
(b) Distinguish between Fresnel's and Fraunhofer diffraction? L5 6M

UNIT-II

- 3 (a) Write Sabine's formula for reverberation time? Mention factors controlling the reverberation time? L2 6M
(b) What is the importance of acoustics in engineering. L1 6M

OR

- 4 (a) Explain Piezoelectric effect. L3 6M
(b) How ultrasonics is produced by using piezoelectric generator? L1 6M

UNIT-III

- 5 (a) Discuss the applications of soft magnetic materials L4 6M
(b) Explain B-H curve of ferromagnetic material. L3 6M

OR

- 6 (a) Describes the different types of polarization? L2 6M
(b) What are the advantages of dielectric materials L1 6M

UNIT-IV

- 7 (a) Explain population inversion? L3 6M
(b) Explain the different pumping mechanisms in laser. L3 6M

OR

- 8 (a) Differentiate step index and graded index fibers. L5 6M
(b) Write brief note on attenuation in optical fibers. L2 6M

UNIT-V

- 9 (a) Explain why surface to volume ratio very large for nano materials? L3 6M
(b) Find the surface area to volume ratio of Sphere using surface area and volume calculation for the given radius is 5 meter? L1 6M

OR

- 10 a) What is bottom up approach and explain sol-gel preparation method with neat diagram? L1 6M
b) What is the effect of size on quantum dot? L1 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech I Year I Semester Supplementary Examinations Dec- 2021/Jan- 2022

APPLIED CHEMISTRY

(Common to ECE & EEE)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- 1 Define Electrode Potential. Derive the Nernst equation for a single electrode potential and write its applications. L1 12M

OR

- 2 Define Conduct metric titrations. Discuss all types of Acid-Base Conduct metric titrations and Explain the nature of the graphs between conductance and volume of titrant used. L1 12M

UNIT-II

- 3 Explain the energy level diagrams of CO and NO molecule. Explain their magnetic nature and Bond order. L3 12M

OR

- 4 What is Crystal field theory? Explain the crystal field splitting in octahedral and tetrahedral complexes. L1 12M

UNIT-III

- 5 Explain the mechanism of Addition polymerization. L3 12M

OR

- 6 Write the preparation, properties and application of Buna-S rubber and Buna-N rubber L2 12M

UNIT-IV

- 7 What are the methods do you follow to separate from the Liquid Mixtures? L1 12M

OR

- 8 Explain the working principle of Atomic Absorption Spectrometer (AAS) and How will you determine the nickel using by AAS? L3 12M

UNIT-V

- 9 Write a brief note on Fullerenes and Carbon nano tubes. L2 12M

OR

- 10 a) Write a note on Super Capacitors. L2 6M
b) Write a note on Liquid Insulating Materials. L2 6M

8/1/22 FM

Q.P. Code: 19CE0101

RT9

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B. Tech I Year I Semester Supplementary Examinations January 2022
ENGINEERING MECHANICS
(Common to CE & MECH)

Time: 3 Hours
Answer one question from each unit (5 × 12 = 60 Marks)
Max. Marks: 60

1 State and prove Varignon's theorem. L1 12M

OR

2 A system of connected flexible cable shown in Fig. is supporting two vertical forces 200 N and 250 N at points B and D. Determine the forces in various segments of the cable. L4 12M

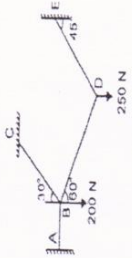


Fig.

UNIT-I

3 Two blocks W1 and W2 resting on two inclined planes are connected by a horizontal bar AB as shown in Fig. If W1 is equal to 1000 N, determine the maximum value of W2 for which the equilibrium can exist. The angle of limiting friction is 20° at all rubbing faces. L4 12M

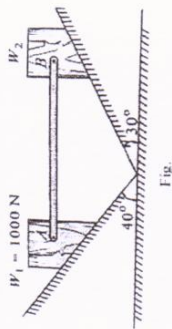


Fig.

OR

4 A ladder 5 meters long rests on a horizontal ground and leans against a smooth vertical wall at an angle 70° with the horizontal. The weight of the ladder is 900 N and acts at its middle. The ladder is at the point of sliding, when a man weighing 750N stands on a rung 1.5 metre from the bottom of the ladder. Calculate the coefficient of friction between the ladder and the floor. L3 12M

5 Determine the centroid of the remaining portion of a circular sheet of metal of radius 50cm when a hole of 10cm radius is taken out from the centre of the circular disc along its horizontal diameter as shown in fig. L2 12M

UNIT-III

Q.P. Code: 19CE0101

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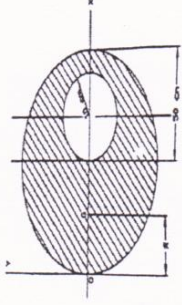


Fig.

OR

6 An I-section as shown in Fig. has the following dimensions in mm units :
Bottom flange = 300 × 100
Top flange = 150 × 50
Web = 300 × 50
Determine mathematically the position of Centre of gravity of the section. L4 12M

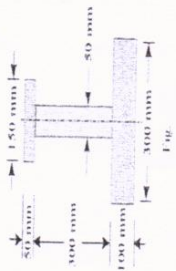


Fig.

UNIT-IV

7 Prove the parallel axis theorem in the determination of moment of inertia of areas with the help of a neat sketch. L5 12M

OR

8 Figure shows the cross-section of a cast iron beam. Determine the moments of inertia of the section about horizontal and vertical axes passing through the centroid of the section. L3 12M

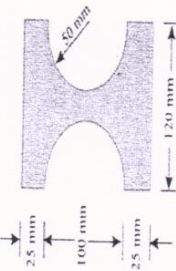


Fig.

UNIT-V

9 Explain the procedure to find forces in members of truss by using method of joints. L3 12M

OR

10 Explain the procedure to find forces in members of truss by using method of sections. L3 12M

SIDDARATHA INSTITUTE OF SCIENCE AND TECHNOLOGY, PUTTUR
(AUTONOMOUS)

B. Tech I Year I Semester Supplementary Examinations January 2022
ENGINEERING GRAPHICS
(Common to ECE & CSE)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

- 1 Construct a hyperbola with the distance between the focus and directrix as 50 mm and eccentricity as $\frac{3}{2}$. Also, draw normal and tangent to the curve at a point 30 mm from the directrix. L2 12M
- 2 Construct an ellipse when the distance between the focus and the directrix is 50 mm and the eccentricity is $\frac{2}{3}$. Draw tangent and normal at a point 40 mm from the directrix. L4 12M

OR

- 3 A point A is 15 mm above HP and 20 mm in front of VP. Another point B is 25 mm behind VP and 40 mm below HP. Draw the projections of A and B, Keeping the distance between the projectors equal to 90 mm. Draw straight lines, joining their top views and front views. L3 12M

OR

- 4 A line AB of 100 mm long is inclined at an angle 30° to H.P and 45 to V.P. A point A is 15 mm above H.P and 20 mm in front of V.P. Draw the projections of the line. L3 12M

UNIT-III

- 5 A square prism of base side 40mm and height 80mm has its base on HP and its faces are equally inclined to VP. Its cut by a plane perpendicular to VP inclined at 60° to HP passing through a point on the axis 55 mm above the HP. Draw its SFV,SSV,STV,TS. L3 12M

OR

- 6 A square pyramid of base 30mm and axis 65 mm long, is resting with its base on H.P and all the edges of the base are equally inclined to VP. It's cut by sectional plane perpendicular to VP and inclined 45° to HP bisecting the axis. Draw its SFV,SSV,STV,TS. L5 12M

UNIT-IV

- 7 A cylinder of 80 mm diameter and 100 axis is completely penetrated by a cone of 80 mm diameter and 120 mm long axis horizontally. Both the axes intersect and bisect each other. Draw the projections. L4 12M

OR

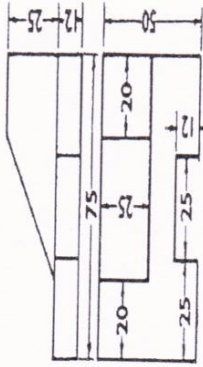
- 8 A vertical cylinder of 50 mm diameter and 70 mm axis is completely penetrated by another horizontal cylinder of 40 mm diameter and 70mm axis. Both axes intersect and bisect each other. Draw the projections showing curves of intersection. L3 12M

UNIT-V

- 9 Draw the isometric view of a pentagonal pyramid side of base 25 mm and axis 60 mm long. The pyramid is resting on its base on H.P, with an edge of the base away from the observer and parallel to V.P. L3 12M

OR

- 10 Draw the isometric view of the following sketch. L3 12M



SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester (R18) Supplementary Examinations DEC 2021/January 2022
BIOLOGY FOR ENGINEERS
(CE & MECH & EEE)

Time: 3 hours

Max.Marks: 60

PART-A
(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)
- | | | |
|---|----|----|
| (a) Define taxonomy? | L1 | 2M |
| (b) What is meiosis? | L1 | 2M |
| (c) How many types of nucleic acids are there? And write any two functions. | L2 | 2M |
| (d) What is complementation? | L2 | 2M |
| (e) What is sterilization? | L1 | 2M |

PART- B
(Answer all five units, 5 x 10 =50 Marks)

UNIT – I

2. Explain the classification of organisms based on carbon utilization of organisms. L3 10M

OR

3. (a) Define Habitat. Explain Terrestrial Habitat. L1 5M
(b) How autotrophs utilize carbon and energy? L1 5M

UNIT – II

4. Define gene Interaction. Give brief account on Dominant Epistasis with suitable example. L1 10M

OR

5. Explain about Phenylketonuria. and Albinism L3 10M

UNIT – III

6. Describe the enzyme action and kinetics? L2 10M

OR

7. What are lipids? Classify and explain different types of lipids L1 10M

UNIT – IV

8. Explain about on Genetic material of DNA? L3 10M

OR

9. Explain genetic code & Degeneracy of genetic code? L3 10M

UNIT – V

10. Write a note on sterilization and various techniques used. L2 10M

OR

11. How to prepare culture medium? Explain it in detail. L1 10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations Dec 2021/January 2022
MATHEMATICS - III
(ECE)

Time: 3 hours

Max. Marks: 60

PART-A**(Compulsory Questions)****Answer the following; (5 X 2 = 10 Marks)**

1. (a) Write the formula for Simpson's $1/3^{\text{rd}}$ rule of numerical integration. L2 2 M
- (b) Define the standard five-point formula. L1 2 M
- (c) Evaluate the Laplace transform of $f(t) = e^{at} \cosh bt$ L4 2 M
- (d) Define the Fourier sine and Fourier cosine transforms L1 2 M
- (e) Solve the partial differential equation $xp + yq = 3z$ L3 2 M

PART-B**(Answer all five units, 5 X 10 = 50 Marks)****UNIT - I**

2. Predict a real root of the equation $x \cdot \log_{10} x = 1.2$ using Regula-Falsi method. L2 10 M

OR

3. Predict $f(1.4)$ using the Newton's forward interpolation from the following data L2 10 M

x	1.1	1.3	1.5	1.7	1.9
$f(x)$	0.21	0.69	1.25	1.89	2.61

UNIT - II

4. Estimate $y(0.1)$, $y(0.2)$ from the differential equation $y' = y^2 + x$, $y(0) = 1$ using Taylor's series method. L5 10 M

OR

5. Estimate $y(0.1)$, $y(0.2)$ from the differential equation $\frac{dy}{dx} = 1 + xy$, $y(0) = 2$ using Runge-Kutta method of 4th order. L5 10 M

UNIT - III

6. Evaluate (a). $\int_0^{\infty} (e^{-4t} t^2 \sin 2t) dt$, (b). $\int_0^{\infty} \left(\frac{\cos at - \cos bt}{t} \right) dt$ using Laplace transform L4 10 M

OR

7. Evaluate $L^{-1} \left\{ \frac{1}{(s^2+5)^2} \right\}$ using convolution theorem. L4 10 M

UNIT - IV

8. Find the Fourier transform of $f(x) = \begin{cases} a^2 - x^2, & |x| \leq a \\ 0, & |x| > a \end{cases}$ and hence show that $\int_0^{\infty} \left(\frac{\sin x - x \cos x}{x^3} \right) dx = \frac{\pi}{4}$ L1 10 M

OR

9. Find the inverse Fourier sine transform of $F_s(p) = \frac{p}{1+p^2}$ L1 10 M

UNIT - V

10. Solve the partial differential equation $\frac{\partial^2 z}{\partial x^2} + \frac{\partial^2 z}{\partial x \partial y} - 6 \frac{\partial^2 z}{\partial y^2} = \cos(2x + y)$ L3 10 M

OR

11. A tightly stretched string with fixed end points $x = 0$ and $x = l$ is initially at rest in its equilibrium position. It is set vibrating by giving each point a velocity $kx(l - x)$. Find the displacement of the string at any distance x from one end at any time t . L3 10 M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations January 2022
Probability and Statistics
(Common to ME & CSE)

Time: 3 hours

Max.Marks: 60

PART-A

(Compulsory Questions)

Answer the following; (5 X 2 = 10 Marks)

1. (a) In a race, the odds in favor of the four horses A, B, C and D are 1:4, 1:5, 1:6, and 1:7 respectively. Assuming that, a dead head is not possible, find the chance that one of them wins the race.
- (b) If a random variable has a Poisson distribution such that $P\{X = 1\} = P\{X = 2\}$, then find $P\{X = 4\}$.
- (c) The mean monthly salary of 10 workers of a group is \$1445. One more worker whose monthly salary is \$1500 has joined the group. Find the mean monthly salary of 11 workers of the group.
- (d) A coin was tossed 400 times and the head turned up 216 times. Determine the test statistic value to test the hypothesis that the coin is unbiased.
- (e) A sample of 10 measurements of the diameter of a sphere gave a mean of 12cm and standard deviation of 0.15cm. Find the 95% confidence limits for the actual diameter.

PART-B

(Answer all five units, 5 x 10 = 50 Marks)

UNIT - I

2. (a) A random variable X has the following probability distribution:

x:	0	1	2	3	4	5	6	7
P(x):	0	k	2k	2k	3k	k ²	2k ²	7k ² + k

 (i) Determine the value of k. (ii) Find $P\{0 < X < 6\}$ and (iii) Compute the expectation of X.
- (b) A continuous random variable X has the density function:

$$f(x) = \begin{cases} 2x - 1, & 1 < x < 2 \\ 0, & \text{otherwise} \end{cases}$$
 Find (i) $P\{0.5 < X < 1\}$ and (ii) $P\{X < 1.2\}$.

OR

3. (a) There are three bags: first containing 1 white, 2 red and 3 green balls; second containing 2 white, 3 red and 1 green balls; third containing 3 white, 1 red and 2 green balls. Two balls are drawn from a bag chosen at random. These are found to be one white and one red. Find the probability that the balls so drawn from the second bag.
- (b) A random variable X has the following probability distribution:

x:	-3	6	9
P(X=x)	1/6	1/3	1/2
∴	6	2	3

 (i) Compute the variance of X. (ii) Find expectation of $(2X + 1)^2$.

3/1/22 AN

UNIT - II

4. (a) A new computer virus attacks a folder consisting of 15 files. Each file gets damaged with probability 0.25 independently of the other files. What is the probability that (i) at least 4 files get damaged (ii) between 2 and 7 files get damaged?
- (b) If the probability of a bad reaction from a certain injection is 0.001. Determine the chance that out of 2000 individuals more than 2 will get a bad reaction.

OR

5. In a test on 2000 electric bulbs, it was found that the life of a particular make was normally distributed with an average life of 2040 hours and standard deviation of 60 hours. Estimate the number of bulbs likely to burn for (i) more than 2150 hours, (ii) less than 1950 hours and (iii) between 1920 and 2160 hours.

UNIT - III

6. (a) Find the regression line that best fits to the following data:

x	1	2	3	4	5
y	14	27	40	55	68
- (b) The following information represents the annual rainfall distribution in some region for a sample of 30 years:

Rainfall (inches)	20-25	25-30	30-35	35-40	40-45
Number of years	3	4	10	7	6

 Find the values of average and modal rainfall amount.

OR

7. (a) The following data were obtained in a study of the relationship between the weight and chest size of infants at birth.

Weight (kg)	2.75	4.41	5.52	3.21	4.32
Chest size (cm)	29.5	26.3	32.2	36.5	27.2

 Find the coefficient of correlation between weight and chest size.
- (b) The breaking strength of 60 cables manufactured by a company are given in the following table:

Breaking strength (in kg.s)	200-210	210-220	220-230	230-240	240-250
Number of cables	5	8	15	20	12

 Find the median breaking strength.

UNIT - IV

8. (a) Fit a second degree parabola to the following data

x	1.0	1.5	2.0	2.5	3.0
y	1.1	1.3	1.6	2.0	2.7
 - (b) A random sample of 64 bags of white cheddar popcorn weighed, on average, 5.23 ounces with a standard deviation of 0.24 ounce. Test the hypothesis that $\mu = 5.5$ ounces against the alternative hypothesis, $\mu < 5.5$ ounces, at the 0.05 level of significance.
- OR
9. (a) A sample of 100 electric bulbs produced by a manufacturer A showed a mean life time of 1190 hours and standard deviation of 90 hours. A sample of 75 bulbs produced by a manufacturer B showed a mean life time of 1230 hours with a standard deviation of 120 hours. Is there a difference between the mean life time of two brands at a significance level of 0.05.
 - (b) Find the least squares fit of the form $y = a + bx^2$ to the following data:

x	-1	0	1	2
y	1.1	1.3	1.6	2.0

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations January 2022
ELECTRONIC DEVICES

(ECE)

Time: 3 hours

Max.Marks: 60

PART-A**(Compulsory Questions)**

Answer the following; (5 X 2 = 10 Marks)

- | | | | |
|----|--|----|----|
| 1. | (a) Explain the formation of depletion region in a PN junction. | L2 | 2M |
| | (b) Define the following terms. i) Ripple Factor ii) Peak Inverse Voltage. | L1 | 2M |
| | (c) Identify a Bipolar junction transistor? How are its terminals named? | L3 | 2M |
| | (d) Why hybrid parameters are called so? Define them. | L1 | 2M |
| | (e) Explain the construction of N channel JFET. | L5 | 2M |

PART- B**(Answer all five units, 5 x 10 =50 Marks)****UNIT - I**

- | | | | |
|----|--|----|-----|
| 2. | Explain with a neat diagram, the action of PN junction under forward and reverse bias. | L2 | 10M |
|----|--|----|-----|

OR

- | | | | |
|----|--|----|----|
| 3. | (a) Explain the effect of temperature on V-I characteristics of a Diode. | L2 | 5M |
| | (b) When a reverse bias is applied to a germanium PN junction Diode, the reverse saturation current at room temperature is $0.3\mu\text{A}$. Determine the current flowing in the diode when 0.15V forward bias is applied at room temperature. | L1 | 5M |

UNIT - II

- | | | | |
|----|--|----|-----|
| 4. | Summarize a full wave rectifier with L-Section filter with necessary diagrams. | L2 | 10M |
|----|--|----|-----|

OR

- | | | | |
|----|---|----|-----|
| 5. | How does a Zener diode acts as a Voltage regulator. | L1 | 10M |
|----|---|----|-----|

UNIT - III

- | | | | |
|----|---|----|-----|
| 6. | Contrast a NPN junction transistor in CE configuration and describe the static input and output characteristics with a neat circuit diagram | L4 | 10M |
|----|---|----|-----|

OR

- | | | | |
|----|---|----|----|
| 7. | (a) Determine the h-parameters for CB configuration? | L5 | 5M |
| | (b) Find I_C , I_E and α for a transistor circuit having $I_B = 15\mu\text{A}$ and $\beta = 150$. | L1 | 5M |

UNIT - IV

- | | | | |
|----|--|----|-----|
| 8. | Explain the working of a single stage RC coupled amplifier and frequency response with necessary diagrams. | L5 | 10M |
|----|--|----|-----|

OR

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|----|--|----|-----|
| 9. | Derive the relationship between α and β | L5 | 10M |
|----|--|----|-----|

UNIT - V

- | | | | |
|-----|--|----|----|
| 10. | (a) Describe the working and characteristics of N-channel JFET | L2 | 5M |
| | (b) Give the comparison of BJT and FET | L5 | 5M |

OR

- | | | | |
|-----|---|----|-----|
| 11. | Give the construction, principle of operation of depletion MOSFET | L4 | 10M |
|-----|---|----|-----|

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations January 2022

ANALOG ELECTRONIC CIRCUITS
(COMMON TO EEE & CSE)

Time: 3 hours

Max.Marks: 60

PART-A

(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)
- | | | |
|---|----|----|
| (a) Draw the circuit symbol of a PN junction diode and explain its working. | L2 | 2M |
| (b) Explain the operation of NPN transistor and state why NPN is widely used. | L1 | 2M |
| (c) Classify Field Effect Transistor. | L3 | 2M |
| (d) Explain the working of non-inverting amplifier. | L5 | 2M |
| (e) Brief out a summing amplifier. | L2 | 2M |

PART- B

(Answer all five units, 5 x 10 =50 Marks)

UNIT – I

2. Explain the working of a zener diode. L2 10M

OR

3. (a) Compare the V-I characteristics of PN-Junction diode and Zener Diode. L4 5M
(b) Why clipper and clamper circuit are used. L1 5M

UNIT – II

4. Explain the input and output characteristics of CB transistor. L2 10M

OR

5. How a BJT act as an amplifier, Explain with necessary diagram. L1 10M

UNIT - III

6. Explain the working and construction of N channel MOSFET L5 10M

OR

7. (a) Compare BJT and FET L5 5M
(b) Explain the terms Gate, Source and Drain L2 5M

UNIT - IV

8. Draw the circuit of Voltage Follower and explain L2 10M

OR

9. Explain Differential Amplifier with necessary equations. L5 10M

UNIT - V

10. (a) Derive first-order Low pass filter. L3 5M
(b) With the help of a functional diagram explain ADC. L4 5M

OR

11. Explain weighted resistor DAC. L5 10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations December 2021/January 2022
DIGITAL SYSTEM DESIGN
(ECE)

Time: 3 hours

Max.Marks: 60

PART-A**(Compulsory Questions)**

1. Answer the following; (5 X 2 = 10 Marks)

- | | | | |
|-----|---|----|----|
| (a) | Define Multilevel Gates. | L2 | 2M |
| (b) | Describe the Commutative law | L1 | 2M |
| (c) | Explain Canonical and Standard Forms. | L3 | 2M |
| (d) | Define and prove the consensus theorem. | L1 | 2M |
| (e) | Explain the principle of duality. | L2 | 2M |

PART- B**(Answer all five units, 5 x 10 =50 Marks)****UNIT - I**

- | | | | |
|----|---|----|-----|
| 2. | What is meant by self-Complementing Code and convert (0.6875) ₁₀ to Binary | L2 | 10M |
|----|---|----|-----|

OR

- | | | | |
|----|--|----|----|
| 3. | (a) State and Apply DeMorgan's theorem. $[(x+y)' + (x+y)']' = x+y$ | L1 | 5M |
| | (b) Describe weighted binary code and Non-weighted code with suitable examples | L3 | 5M |

UNIT - II

- | | | | |
|----|--|----|-----|
| 4. | the octal equivalent of hexadecimal numbers of DC.BA and AB.CD | L2 | 10M |
|----|--|----|-----|

OR

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|----|---|----|-----|
| 5. | Explain the Karnaugh maps of 5 variables with suitable examples | L3 | 10M |
|----|---|----|-----|

UNIT - III

- | | | | |
|----|--|----|-----|
| 6. | Prepare the Master-Slave JK FF for the industrial applications | L2 | 10M |
|----|--|----|-----|

OR

- | | | | |
|----|---|----|----|
| 7. | (a) Describe the Shift registers and Clock generation | L3 | 5M |
| | (b) Write about the Pseudo Random Binary Sequence generator | L1 | 5M |

UNIT - IV

- | | | | |
|----|--|----|-----|
| 8. | List out the Synchronous counters applications and design with suitable examples | L2 | 10M |
|----|--|----|-----|

OR

- | | | | |
|----|--|----|-----|
| 9. | Explain the Edge triggered FF with suitable examples | L3 | 10M |
|----|--|----|-----|

UNIT - V

- | | | | |
|-----|--|----|----|
| 10. | (a) Draw the diagrams of TTL by NAND gate | L2 | 5M |
| | (b) Draw the neat diagrams of the PLA Logic. | L2 | 5M |

OR

- | | | | |
|-----|--|----|-----|
| 11. | Define the Specifications, Noise margin, Propagation delay and fan-in, fan-out | L1 | 10M |
|-----|--|----|-----|

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year I Semester (R18) Supplementary Examinations January 2022

STRENGTH OF MATERIALS

(MECH)

Time: 3 hours

Max.Marks: 60

PART-A

(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)
- | | | |
|--|----|----|
| (a) Define the terms Factor of Safety and Poisson's ratio. | L1 | 2M |
| (b) What is the use of SFD and BMD. | L2 | 2M |
| (c) What is the meaning of strength of section. | L2 | 2M |
| (d) What causes deflection of beam. | L2 | 2M |
| (e) How do you measure internal pressure in a tank. | L3 | 2M |

PART- B

(Answer all five units, 5 x 10 =50 Marks)

UNIT - I

2. Define Strain energy & resilience. A tensile load of 60 KN is gradually applied to a circular bar of 4 cm diameter and 5 m long if $E=2 \times 10^5 \text{N/mm}^2$. Determine: i) stretch in the rod (ii) stress in the rod and (iii) strain energy absorbed by the rod
- L3 10M

OR

3. (a) Define Bulk Modulus. Calculate the Bulk modulus for a material having young's modulus $1.2 \times 10^5 \text{N/mm}^2$ and $\mu=1/4$. L2 5M
- (b) A bar of 30mm diameter is subjected to a pull of 60 KN. The measured extension on gauge length of 200 mm is 0.1mm and change in diameter is 0.004 mm, calculate:(i) Young's modulus (ii) Poisson's Ratio and (iii) bulk modulus. L3 5M

UNIT - II

4. Draw the SFD and BMD for the cantilever beam carrying uniformly distributed load of whole length and also derive an equation for it. L3 10M

OR

5. Draw the shear force and bending moment diagram for a simply supported beam AB of span 9 meters carrying a uniformly distributed load of 18 KN per meter for a distance of 4 meters from the left support A. L3 10M

UNIT - III

6. Derive the formula for shear stress at a section. L4 10M

OR

7. A steel beam of I -section, 200 mm deep and 160 mm wide has 16 mm thick flanges and 10 mm thick web. The beam is subjected to a shear force of 200 KN. Determine the shear stress distribution over the beam section. L5 10M

UNIT - IV

8. Derive an expression for Torque transmitted by a hollow circular shaft L5 10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations January 2022
SIGNALS & SYSTEMS
(ECE)

Time: 3 hours

Max.Marks: 60

PART - A

(Compulsory Questions)

Answer the following; (5 X 2 = 10 Marks)

1. (a) Define BIBO with an example. L1 2M
- (b) Give the expressions of CTFT L1 2M
- (c) What is the relation between impulse response and transfer function of a system? L1 2M
- (d) State frequency Convolution theorem. L1 2M
- (e) Find Z-transform and ROC of $x(n) = a^n u(n)$ L1 2M

PART - B

(Answer all five units, 5 x 10 = 50 Marks)

UNIT - I

2. Derive the expression for the Trigonometric Fourier Series coefficients. L2 10M

OR

3. (a) Obtain trigonometric Fourier series from exponential Fourier series L2 5M
- (b) Obtain exponential Fourier series from trigonometric Fourier series L2 5M

UNIT - II

4. Using the properties of DFT, Find the FT of the following L3 10M

- a) $x(n) = n2n u(n)$ b) $x(n) = (12)^n - 4u(n-4)$ c) $x(n) = e/j2n u(n)$
d) $x(n) = u(n+1) - u(n+2)$ e) $x(n) = \delta(n-2) - \delta(n+2)$.

OR

5. (a) Derive the Continuous Fourier transform of a non-periodic signal from Continuous Fourier series of periodic signal L2 5M
- (b) State the merits and limitation of Fourier transform 5M

UNIT - III

6. Explain the properties of LTI system in detail L2 10M

OR

7. (a) A system produces an output $y(t) = e^{-t} u(t)$ for an input of $x(t) = e^{-2t} u(t)$. Determine the impulse response and frequency response of the system. L3 5M

- (b) A system produces an output $y(t) = e^{-3t} u(t)$ for an input of $x(t) = e^{-5t} u(t)$. Determine the impulse response and frequency response of the system. L3 5M

UNIT - IV

8. Explain the cross correlation and their properties in energy signals and power signals L2 10M

OR

9. Find the Convolution of the following signals. L3 10M

- a) $x1(t) = e^{-2t} u(t)$; $x2(t) = e^{-4t} u(t)$ b) $x1(t) = tu(t)$; $x2(t) = tu(t)$
c) $x1(t) = \sin t u(t)$; $x2(t) = u(t)$ d) $x1(t) = e^{-3t} u(t)$; $x2(t) = u(t+3)$
e) $x1(t) = e^{-t} u(t)$; $x2(t) = u(t)$

UNIT - V

10. (a) Find the Laplace transform of the following signals and find their ROCs L2 5M
 $x(t) = e^t \sin 2t$ for $t \leq 0$
- (b) Find the Laplace transform of the following signals and find their ROCs L2 5M
 $x(t) = te^{-2|t|}$

OR

11. Draw the pole-zero plot and determine the magnitude of the Fourier transform of the signal whose Laplace transform is $x(s) = (S^2 - 5S + 1) / (S^2 + 5S + 1)$ L3 10M

SIDDHARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester (R18) Supplementary Examinations January 2022
ELECTRICAL MACHINES-I
(EEE)

Time: 3 hours

Max.Marks: 60

PART-A

(Compulsory Questions)

Answer the following: (5 X 2 = 10 Marks)

1. (a) What is the purpose of inter poles?
(b) If the applied voltage of a DC motor is 230 V, then back emf, for maximum power developed is?
(c) Write the condition for maximum efficiency?
(d) Formulate the Regulation of a transformer at any load x.
(e) What are the types of 1- ϕ Induction Motor?

PART-B

(Answer all five units, 5 x 10 =50 Marks)

UNIT - I

2. Explain the basic principle of operation of a DC Generator with a simple loop generator? L1 L3 10M

OR

3. Enumerate all the parts of a DC machine and indicate their function? L1 10M

UNIT - II

4. A 25HP, 250V DC Series motor has armature resistance 0.1 Ω and field resistance 0.05 Ω and brush Contact drop 3V. When the line current is 80A, the speed is 600rpm. Find the speed when the line Current is 100A. L4 10M

OR

5. Explain the armature voltage and field flux control methods for the Speed control of a DC Motor. L3 10M

UNIT - III

6. Describe Field's test in detail. What are its advantages and disadvantages? L2 10M

OR

7. What do you mean by power stages in a D.C machine? Also Explain (i) Electrical efficiency ii) Mechanical efficiency (iii) commercial efficiency? L1 10M

UNIT - IV

8. (a) Explain the principle of operation of an transformer. L3 5M
(b) Derive the e. m. f. equation of a transformer. L4 5M

OR

9. (a) With relevant phasor diagrams, explain the operation of a practical single phase transformer under no load condition. L2 5M

- (b) A 230/2300V transformer takes a no load current of 6.5A and absorbs 187W. If the resistance of primary is 0.06 Ω , find (a) Core loss (b) no load power factor (c) active component of current and (d) magnetizing current. L5 5M

UNIT - V

10. Explain the operation of Split phase 1- ϕ Induction Motor. L3 10M
- OR
11. Explain the construction and operation of Universal Motor. List out its merits and demerits. L3 10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester (R18) Supplementary Examinations January 2022
DATABASE MANAGEMENT SYSTEMS
(CSE)

Time: 3 hours

Max.Marks: 60

PART-A
(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)

- | | | |
|---|----|----|
| (a) Define Entity, Attributes, Entity set, relationship with appropriate notations. | L1 | 2M |
| (b) Define-relational algebra | L2 | 2M |
| (c) What are axioms | L1 | 2M |
| (d) Define validation based protocols. | L1 | 2M |
| (e) . Define rotational latency time. | L1 | 2M |

PART- B
(Answer all five units, 5 x 10 =50 Marks)

UNIT - I

- | | | |
|--|----|-----|
| 2. Explain about Database languages with examples. | L3 | 10M |
|--|----|-----|

OR

- | | | |
|--|----|-----|
| 3. Explain about integrity constraints over relations. | L3 | 10M |
|--|----|-----|

UNIT - II

- | | | |
|---|----|-----|
| 4. Write about relational algebra? Discuss about different operators used in algebra. | L1 | 10M |
|---|----|-----|

OR

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|--|----|-----|
| 5. What is a join operator? Explain about conditional join and natural join with syntax and example. | L2 | 10M |
|--|----|-----|

UNIT - III

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|--|----|-----|
| 6. What are different types of normalization? Also explain the difference between BCNF and 3NF | L1 | 10M |
|--|----|-----|

OR

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|--|----|-----|
| 7. Explain about schema refinement in database design. | L3 | 10M |
|--|----|-----|

UNIT - IV

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|---|----|-----|
| 8. Explain transaction states with example. | L3 | 10M |
|---|----|-----|

OR

- | | | |
|---|----|-----|
| 9. Explain serializability in transaction management. | L3 | 10M |
|---|----|-----|

UNIT - V

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|---------------------------------|----|-----|
| 10. Compare file organizations. | L5 | 10M |
|---------------------------------|----|-----|

OR

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|----------------------------|----|-----|
| 11. Explain about B+ Tree. | L3 | 10M |
|----------------------------|----|-----|

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations January 2022
Network Theory

(Electrical and Electronics Engineering)

Time: 3 hours

Max.Marks: 60

PART-A

(Compulsory Questions)

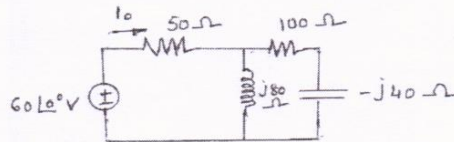
1. Answer the following; (5 X 2 = 10 Marks)
- | | | |
|---|----|----|
| (a) Write the limitations of ohms law. | L1 | 2M |
| (b) Compare band pass and band reject filters | L1 | 2M |
| (c) Draw the transient response of RLC series circuit for DC excitation. | L1 | 2M |
| (d) Differentiate impedance and admittance parameters in two port networks. | L1 | 2M |
| (e) Define Fourier integral. List out its uses in electrical engineering | L1 | 2M |

PART- B

(Answer all five units, 5 x 10 =50 Marks)

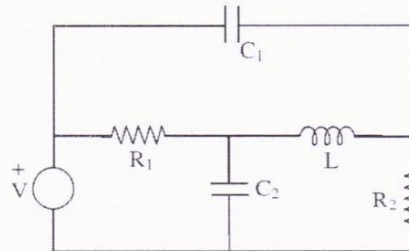
UNIT - I

2. (a) Discuss the concept of source transformation technique. L2 4M
(b) Find current I_o in the circuit shown in below Figure L3 6M



OR

3. (a) Differentiate active and passive elements with examples. L2 4M
(b) Draw the dual of the Network shown in given below Figure L3 6M



UNIT - II

4. (a) A series RLC circuit consists of a resistance of 1 k ohm, an inductance of 10 mH and a capacitance of 100 μ F. For a supply voltage of 100V, determine the Resonant frequency. L3 5M
(b) Explain about Constant-K high-pass filter in detail. L2 5M

OR

5. (a) Write the expression for impedance of R-L-C series circuit. When does it have minimum impedance? L2 5M
(b) Define Q-factor. Find the Q-factor for an inductor and capacitor. L2 5M

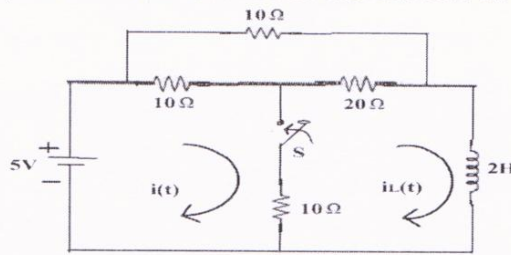
UNIT - III

6. (a) A Series RLC circuits has $R=50$ ohm, $L=0.2$ H, and $C = 50$ microfarad. Constant voltage of 100V is impressed upon the circuit at $t=0$. Find the expression for the transient current assuming initially relaxed conditions. L3 5M

Q.P. Code: 18EE0242

R18

- (b) The circuit shown in below figure, the switch "S" is open and the circuit reaches a steady state. At $t=0$, the "S" is closed. Find the current in the inductor for $t>0$. L3 5M

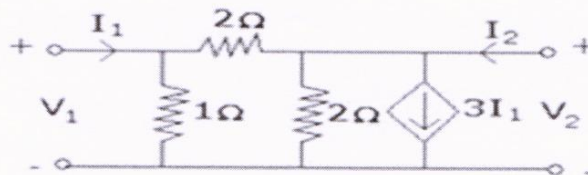


OR

7. (a) Derive the Transient Response of series RL-circuit with D.C excitation L2 5M
 (b) A series RC circuit consists of a resistor of 10Ω and capacitor of 0.1 F with a constant voltage of 20 v , is applied to the circuit at $t=0$. Obtain the current equation. Determine the voltage across the resistor and the capacitor. L3 5M

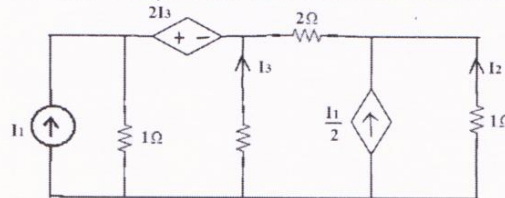
UNIT - IV

8. Find the Y-parameters of the network show in below Figure and there by obtain Z-parameters. L3 10M



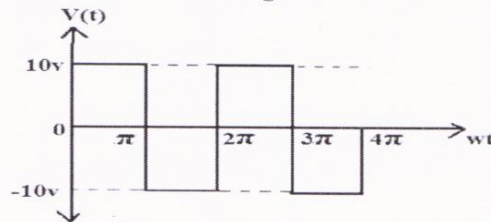
OR

9. Find the current transfer ratio I_2/I_1 for the network shown on figure. L3 10M



UNIT - V

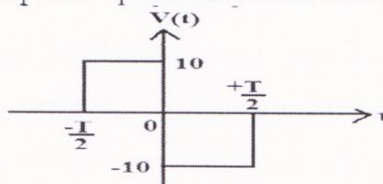
10. (a) Obtain the Fourier series for the following waveform shown in figure. L3 5M



- (b) Derive the Trigonometric form of Fourier series. L2 5M

OR

11. Obtain the magnitude and phase spectrum of the waveform shown in figure. L3 10M



Q.P. Code: 19ME0345

R19

SIDDARATHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR

(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations Dec 2021/January 2022

BASIC ELECTRICAL & MECHANICAL ENGINEERING

(CIVIL)

Time: 3 Hours

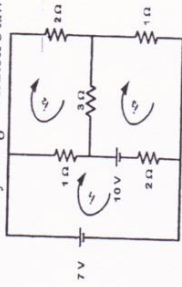
Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

PART - A

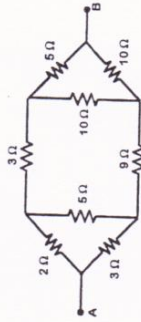
UNIT-I

- 1 a) State and prove Kirchhoff's laws with suitable examples.
- b) Find i_1, i_2, i_3 for the given circuit by using Kirchhoff's laws?



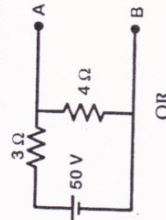
OR

- 2 Find the voltage to be applied across AB in order to drive a current of 5A into the circuit.



UNIT-II

- 3 a) State Norton's theorem.
- b) Find Norton's equivalent circuit across AB for the circuit shown.



OR

- 4 a) The given ABCD parameters are $A=2, B=0.9, C=1.2, D=0.5$. Find Y-parameters.
- b) The given Y-parameters are $Y_{11}=0.5, Y_{12}=Y_{21}=0.6, Y_{22}=0.9$. Find the Impedance parameters.

UNIT-III

- 5 Briefly discuss about various types of DC motors with neat sketches.
- 6 a) Explain constructional details of transformer.

Q.P. Code: 19ME0345

R19

- b) A 20 KVA, 2000/200 V, 50 Hz transformer has 66 secondary turns. Calculate the number of primary turns and primary and secondary currents. Neglect losses.

PART-B

UNIT-I

- 1 a) What is casting? Describe the defects in casting and prevents.
- 2 Draw a sketch of Gating system and explain the functions of various elements? Explain the types of gating systems with neat diagram.

UNIT-II

- 3 Define the working principle of lathe? Draw the layout of lathe and write the specification lathe.

OR

- 4 a) What is the working principle and principle parts of a drilling and horizontal or vertical boring machine?
- b) Explain the principle features of milling machine?

UNIT-III

- 5 Role of systems in automobile? List the various systems in automobile?
- 6 Define Psychometry and Explain their Properties.

Q.P. Code: 19EE0240

R19

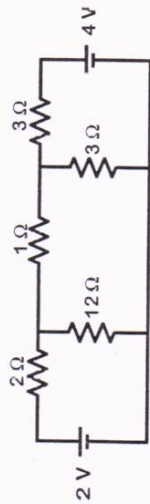
SIDDARATHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations Dec-2021/January 2022
BASIC ELECTRICAL & ELECTRONICS ENGINEERING
(MECH)

Time: 3 Hours

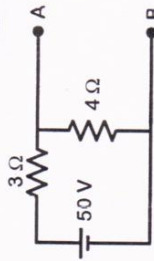
Max. Marks: 60
Answer one question from each unit (5 x 12 = 60 Marks)

PART - A

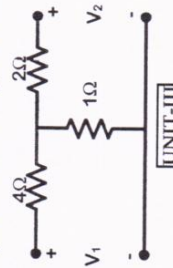
- 1 Explain about the Star-Delta and Delta-Star transformation L2 10M
OR
 2 Find the current through 12Ω resistor for the given circuit using L3
 Kirchoff's laws



- 3 a) State Thevenin's theorem L1 2M
 b) Find the Thevenin's equivalent circuit across AB for the circuit shown. L3 10M



- 4 Find the Open circuit parameters for the given circuit L4 8M
OR



- 5 a) Discuss about the principle of operation of DC motors L2 10M
 b) Calculate the value of torque established by the armature of a 4-pole DC motor having 774 conductors, 2 paths in parallel, 24mwb flux per pole when the total armature current is 50A. L2 5M
OR
 6 a) Derive the condition for maximum efficiency of the transformer. L3 5M

Q.P. Code: 19EE0240

R19

- b) Discuss about the voltage regulation of the transformer L3 5M
PART-B
 1 a) Distinguish between conductors, semiconductors and insulators. L2 5M
 Draw the atomic structure of a semiconductor and explain why an L3 5M
 intrinsic semiconductor is relatively a poor conductor of electricity
OR
 2 Distinguish between intrinsic and extrinsic semiconductors and explain L6 10M
 the process of conduction in each of them.
UNIT-II
 3 Draw the circuit diagram for a common base circuit arrangement and L3 10M
 plot its input and Output characteristics. Show the different regions of L3 10M
 the output characteristics and explain their occurrence.
OR
 4 Draw the circuit diagram for a common Collector circuit arrangement L3 10M
 and plot its input and Output characteristics. Show the different regions L3 10M
 of the output characteristics and explain their occurrence.
UNIT-III
 5 Explain the CS configuration ? With construction and its operation L3 10M
OR
 6 a) Explain the static characteristics of MOSFET and draw its L3 5M
 characteristics L1 5M
 b) Write the application of MOSFET

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations Dec 2021/January 2022

PROBABILITY, NUMERICAL METHODS AND TRANSFORMS

(EEE)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- 1 a) In a group there are 3 men and 2 women. Three persons are selected at random from this group. Apply the probability that one man and two women or two men and one woman are selected. L3 6M
- b) Five persons in a group of 20 are engineers. If three persons are selected at random, determine the probability that all are engineers and the probability that at least one is an engineer. L5 6M

OR

- 2 In a certain college 25% of boys and 10% of girls are studying mathematics. The girls constitute 60% of the student body. (a) What is the probability that mathematics is being studied? (b) If a student is selected at random and is found to be studying mathematics, find the probability that the student is a girl (c) a boy. L1 12M

UNIT-II

- 3 By using Bisection method to find the square root of 25, when $x_0 = 2.0$, $x_1 = 7.0$ L3 12M

OR

- 4 What is the root of the equation $xe^x = 2$ using Regula-falsi method. L1 12M

UNIT-III

- 5 Tabulate $y(0.1)$, $y(0.2)$ and $y(0.3)$ using Taylor's series method given that $y' = y^2 + x$ and $y(0) = 1$ L2 12M

OR

- 6 Using R-K method of 4th order, solve $\frac{dy}{dx} = \frac{y^2 - x^2}{y^2 + x^2}$, $y(0) = 1$. Find $y(0.2)$ and $y(0.4)$. L3 12M

UNIT-IV

- 7 Applying Laplace transform method to solve $Y'' - 3Y' + 2Y = 4t + e^{3t}$ where $y(0) = 1, y'(0) = 1$ L2 12M

OR

- 8 a) Find the Laplace transform of $f(t) = e^{4t} \sin 2t \cos t$ L2 6M
- b) Value the Laplace transform of $f(t) = (\sqrt{t} + 1/\sqrt{t})^3$ L5 6M

UNIT-V

- 9 Determine the value of $Z(\cos nt)$ and $Z(\sin nt)$. Hence find (i) $Z(n \cos nt)$ (ii) $Z(n \sin nt)$ L5 12M

OR

- 10 Applying the Z-transform, solve $y_{n+2} - 6y_{n+1} + 8y_n = 2^n + 6n$ 12M

- 1 a) Use method of false position to find the root of the equation $x^3 - 2x - 5 = 0$ correct to 3 decimal places. L2 6M
 b) Using Newton-Raphson's iteration method, find the real root of the following equations correct to three decimal places. $xe^x - 2 = 0$ L3 6M

UNIT-I

OR

- 2 State Newton's forward and backward interpolation formulae and hence compute $f(1.75)$ and $f(2.25)$ from the following table. L2 12M

x:	1.7	1.8	1.9	2.0	2.1	2.2	2.3
f(x):	5.474	6.050	6.689	7.389	8.166	9.025	9.974

UNIT-II

- 3 Solve by Taylor's series $\frac{dy}{dx} = \log(xy)$ for $y(1.1)$ and $y(1.2)$, given $y(1) = 2$. L3 12M

OR

- 4 a) Use Trapezoidal rule to estimate $\int_0^2 e^x dx$ taking 10 intervals. L2 6M
 b) Use Simpson's 1/3rd rule to estimate $\int_0^6 e^{-x^2} dx$. L3 6M

UNIT-III

- 5 a) Find the Laplace transform of the following L3 6M
 (i) $e^{2t} + \sin 2t - \cosh 3t + t^5 + t^2 + 100$ (ii) $\frac{1 - \cos at}{t}$
 b) Apply convolution theorem to evaluate $L^{-1} \left(\frac{s}{(s^2 + a^2)^2} \right)$. L3 6M

OR

- 6 Solve $\frac{d^2x}{dt^2} + 9x = \cos 2t$, $x(0) = 1$, $x(\pi/2) = -1$. L3 12M

UNIT-IV

- 7 Write the Euler's formula for expanding a periodic function in sine and cosine terms. Also, obtain the Fourier series expansion of $f(x) = e^{-x}$ in the interval $0 < x < 2\pi$. L3 10M

OR

- 8 Obtain the Fourier series expansion of $f(x) = \begin{cases} \pi x, 0 \leq x \leq 1 \\ \pi(2-x), 1 \leq x \leq 2 \end{cases}$ L3 10M

Hence deduce that $\frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \frac{1}{7^2} + \dots = \frac{\pi^2}{8}$

- 9 Find the Fourier sine transform of $e^{-|x|}$ and hence evaluate $\int_0^{\infty} \left(\frac{x \sin mx}{1+x^2} \right) dx$. L3 12M

OR

- 10 Find the Fourier sine and cosine transform of $f(x) = 2x$, $0 < x < 4$. L3 12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations Dec 2021/January 2022
MICROPROCESSORS AND MICROCONTROLLERS
(CSE)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- | | | | |
|---|--|----|----|
| 1 | a) Explain Microprocessor controlled temperature system (MCTS) | L2 | 6M |
| | b) Discuss Input and output devices of Computers | L2 | 6M |

OR

- | | | | |
|---|--|----|----|
| 2 | a) Discuss in detail Microprocessor Architecture and its operation | L2 | 6M |
| | b) Explain different Memory Modules in Computers. | L2 | 6M |

UNIT-II

- | | | | |
|---|---|----|----|
| 3 | a) What are the various types of data formats for 8085 instructions? Give list of examples. | L1 | |
| | b) Discuss about Demultiplexing the bus AD7-AD0. | L2 | 6M |

OR

- | | | | |
|---|---|----|----|
| 4 | a) Draw the internal architecture of 8085 microprocessor. | L2 | 6M |
| | b) Draw and explain memory read timing diagram of 8085. | L2 | 6M |

UNIT-III

- | | | | |
|---|--|----|----|
| 5 | a) Write the available special function registers in 8051. | L3 | 4M |
| | b) Explain each special function register with format. | L2 | 8M |

OR

- | | | | |
|---|---|----|----|
| 6 | a) Draw the pin diagram of 8051 microcontroller and explain the function of each pin in detail. | L2 | |
| | b) Explain the different serial communication modes in 8051. | L2 | 6M |

UNIT-IV

- | | | | |
|---|--|----|----|
| 7 | a) Discuss the types of addressing modes apply with suitable examples in 8051. | L3 | 6M |
| | b) What is the operation carried out when 8051 executes the instruction <code>MOVC A, @A+DPTR</code> ? | L4 | 6M |

OR

- | | | | |
|---|--|----|----|
| 8 | a) Explain Jump and call instructions in 8051. | L4 | 6M |
| | b) Explain Logical operations and Arithmetic operations in 8051. | L4 | 6M |

UNIT-V

- | | | | |
|---|---|----|----|
| 9 | a) Explain about multiple interrupts. | L4 | 6M |
| | b) Design a program for keyboard interfacing with 8051. | L6 | 6M |

OR

- | | | | |
|----|---|----|----|
| 10 | a) Interface A/D converter with 8051 and Explain. | L4 | 6M |
| | b) Interface D/A converter with 8051 and Explain. | L4 | 6M |

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations January 2022
STRENGTH OF MATERIALS-II
(CIVIL)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- 1 A thin cylindrical shell is 3m long and 1m in internal diameter. It is subjected to internal pressure of 1.2 MPa. If the thickness of the sheet is 12mm, find the circumferential stress, longitudinal stress, changes in diameter, length and volume. Take $E=200$ GPa and $\mu=0.3$. L3 12M

OR

- 2 Derive an expression for hoop and radial stresses across thickness of the thick cylinder L2 12M

UNIT-II

- 3 Derive kernel of section for (i) Rectangular section. (ii) Circular section. (iii) Hollow Circular sections. L2 12M

OR

- 4 (a) Explain maximum strain energy theory. L3 6M
(b) Explain maximum principal strain theory. L3 6M

UNIT-III

- 5 Derive pure torsion equation for a circular shaft with assumptions. L4 12M

OR

- 6 (a) Define Polar modulus, Torsional rigidity. L1 6M
(b) A hollow steel rod 200 mm long is to be used as torsional spring. The ratio of inside to outside diameter is 1 : 2. The required stiffness of this spring is 100N.m/degree. Determine the outside diameter of the rod. Value of G is 8×10^4 N/mm². L3 6M

UNIT-IV

- 7 A fixed beam AB of length 3 m carries a point load of 45 kN at a distance of 2 m from A. If the flexural rigidity (i.e., EI) of the beam is 1×10^6 determine : L3 12M
(i) Fixed end moments at A and B,
(ii) Deflection under the load, (iii) Maximum deflection, and
(iv) Position of maximum deflection.

OR

- 8 A continuous beam ABC of uniform section with span AB and BC as 4 m each, is fixed at A and simply supported at B and C. The beam is carrying a uniformly distributed load of 6 kN/m run throughout its length. Find the support moments and the reactions using theorem of three moments. Also draw SFD and BMD. L2 12M

UNIT-V

- 9 Explain the importance of curved beams in structures. L3 12M

OR

- 10 Calculate the stresses in curved beams and state the assumptions made in the analysis of curved beams L2 12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
 (AUTONOMOUS)
 B.Tech II Year I Semester Supplementary Examinations January 2022
ELECTRICAL CIRCUITS-II

(EEE)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- 1 Derive the relationship between Phase and Line voltages, currents in delta connected load. L3 12M

OR

- 2 Derive the relationship between Phase and Line voltages, currents in star connected load. L3 12M

UNIT-II

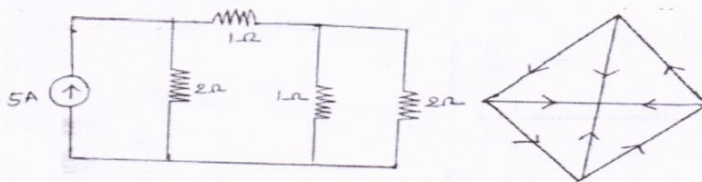
- 3 Derive the transient response of an RC circuit with dc excitation. L4 12M

OR

- 4 Derive the transient response of an RL circuit with Ac excitation. L4 12M

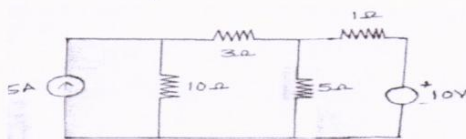
UNIT-III

- 5 Find the cutset matrix for the followings? L3 12M



OR

- 6 Determine current in 10Ω resistor for the following network by using nodal analysis. L3 12M



UNIT-IV

- 7 Derive the expressions for Z-parameters in terms of ABCD parameters. L3 12M

OR

- 8 Derive the expressions for Y-parameters in terms of ABCD parameters? L3 12M

UNIT-V

- 9 A 1kΩ resistor is in series with a 500mH inductor. This series combination is in parallel with a 0.4μF capacitor. Express the equivalent s-domain impedance of these parallel branches as a rational functional. L4 12M

OR

- 10 Define Laplace transform of a function. L1 6M
 Derive Laplace transform of all standard signals L3 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations January 2022
COMPUTER ORGANIZATION & ARCHITECTURE
(CSE)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- 1 Sketch the basic functional unit of computer and explain each unit in detail. L3 12M

OR

- 2 Summarize the Addressing Modes with neat sketch. L5 12M

UNIT-II

- 3 Illustrate the steps in Booth multiplication algorithm and Draw the flowchart with an example. L3 12M

OR

- 4 (a) Compare signed number, 1's complement, 2's complement with an example. L5 6M
(b) Describe about fixed and floating point representations L2 6M

UNIT-III

- 5 Define register transfer language? Explain in detail. L2 12M

OR

- 6 (a) Examine the Bus transfer with neat diagram. L3 6M
(b) Summarize the Register Representations and way it is used. L5 6M

UNIT-IV

- 7 Describe the use of DMA controllers in a computer system with a neat block diagram L2 12M

OR

- 8 Give detailed notes on DMA controllers and transfers with neat sketch L4 12M

UNIT-V

- 9 Define the hazards? Explain in detail about instruction hazards? L3 12M

OR

- 10 Implement three types multiprocessor system with neat sketch L6 12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations January 2022
SURVEYING & GEOMATICS

(CIVIL)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

1 Explain in detail the classifications of surveying. L3 12M

OR

2 With neat sketch, explain the prismatic compass by indicating their parts. L2 12M

UNIT-II

3 What are the indirect methods of locating a contour? Write about any two method L3 12M

OR

4 (a) Write short notes on methods of leveling. L1 6M

(b) Briefly explain the temporary adjustment of leveling L2 6M

UNIT-III

5 Derive an expression to find the height of an object by double plane method L5 12M

OR

6 (a) What is an analytical lens? Establish the basic equation for an analytic lens. L2 6M

(b) How would you, determine the constants K and C of a Tachometer. L3 6M

UNIT-IV

7 Mention the various methods of setting out of simple curve. Explain with offsets from long chord method in detail. L3 12M

OR

8 Describe with sketch the method of setting a simple circular curve by Rankine's deflection angle method. L4 12M

UNIT-V

9 Explain with sketch the principle of EDM instrument. L2 12M

OR

10 Describe with sketch, the fundamental measurement of angles and distances by total station. L3 12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations January 2022
FLUID MECHANICS & HYDRAULICS MACHINERY
(MECH)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

Note: Assume suitable data, if any data is missing**UNIT-I**

- 1 a) Explain compressibility, surface tension and capillarity L2 6M
b) Discuss briefly about piezometer, manometer and inverted U-tube manometer with a neat sketch L3 6M

OR

- 2 a) Define fluid and write the expression for any four physical properties of fluids L1 6M
b) State and prove Pascal's law when the pressure variation in a static fluid L4 6M

UNIT-II

- 3 a) What do mean by stream tube, stream line and streak line L2 6M
b) Derive Euler's equation of motion along a streamline L4 6M

OR

- 4 a) Derive continuity equation in one- and three-dimensional forms L4 8M
b) Distinguish between Energy gradient line and Hydraulic gradient line. L2 4M

UNIT-III

- 5 a) Describe briefly orifice meter and derive the expression for measuring discharge of fluid through a pipe with this device L4 6M
b) Write the importance of Hardy Cross method in pipe networks L1 6M

OR

- 6 a) What is a pitot tube and explain how it used for measuring velocity of flow at any point in a pipe L1 6M
b) Write the examples for minor losses in pipe flow and discuss the significance of pipes connected in parallel L2 6M

UNIT-IV

- 7 a) Derive an expression for the force exerted by a jet of water on a fixed vertical plate in the direction of jet L3 6M
b) Explain the various components of dam type power plant. L2 6M

OR

- 8 a) State and discuss forced vortex and free vortex L1 6M
b) Discuss the various types of hydroelectric power plant L2 6M

UNIT-V

- 9 a) Define hydraulic turbine and discuss how the turbines are classified L1 6M
b) Define gross head and effective head and write the expressions for hydraulic, manometric, volumetric and overall efficiencies of a centrifugal pump L3 6M

OR

- 10 a) State the merits and demerits of a modern Francis turbine over Pelton turbine L2 6M
b) Discuss the various components of centrifugal pump and explain working of a centrifugal pump L3 6M

Time: 3 Hours Max. Marks: 60
Answer one question from each unit (5 x 12 = 60 Marks)

- 1 a) The reverse saturation current of a silicon PN junction diode is $10\mu\text{A}$. Solve the diode current for the forward bias voltage of 0.6V at 250°C . L3 6M
- b) Demonstrate the effect of temperature on V-I characteristics of PN junction diode. L2 6M

OR

- 2 a) List the application of PN junction and Zener diodes. L1 6M
- b) Determine the expression for Diffusion capacitance of a PN Junction Diode. L5 6M

UNIT-II

- 3 a) A half wave rectifier is supplied from a 230V , 50Hz supply with a step-down ratio of 3:1 to a resistive load of $10\text{k}\Omega$. The diode forward resistance is 75Ω while transformer secondary is 10Ω . Examine maximum, average, RMS values of current, DC output voltage, efficiency of rectification and ripple factor. L4 6M
- b) A full wave rectifier circuit is fed from a transformer having a center-tapped secondary winding. The rms voltage from either end of secondary to center tap is 30V . If the diode forward resistance is 2Ω and that of the half secondary is 8Ω , for a load of $1\text{k}\Omega$. Solve DC power delivered to the load, efficiency of rectification and TUF of secondary. L3 6M

OR

- 4 a) Demonstrate the working principle of LC filter with neat diagram and derive the expression for its ripple factor. L2 6M
- b) Dissect the construction and working principle of CLC or π section filter along with derivation for its ripple factor. L4 6M

UNIT-III

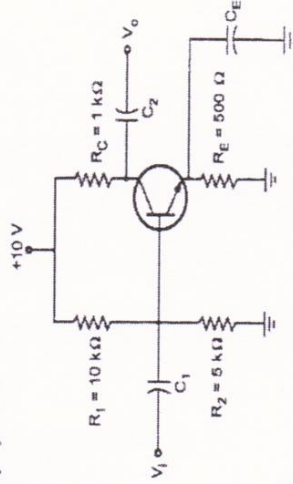
- 5 a) Evaluate the relation between α , β and Y of a Transistor. L5 6M
- b) For a transistor, the leakage current is $0.1\mu\text{A}$ in CB configuration, while it is $19\mu\text{A}$ in CE configuration. Find α & β of the same transistor? L1 6M

OR

- 6 Interpret the operation and characteristics of n-channel depletion type MOSFET with diagram. L2 12M

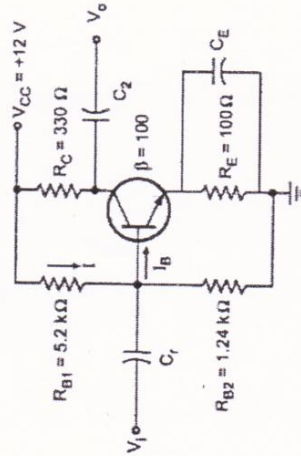
UNIT-IV

- 7 a) Illustrate Thermistor Compensation Technique. L2 6M
- b) For the circuit shown in Fig. $\beta = 100$ for the silicon transistor. L4 6M



OR

- 8 a) Draw the dc load line for the following transistor configuration. Obtain the quiescent Point. L1 12M



UNIT-V

- 9 a) Discuss the frequency response of an amplifier. Why hybrid model is used for the analysis of BJT amplifier at low frequencies? L6 6M
- b) Draw the hybrid model for CE transistor and derive the hybrid parameters. L1 6M

OR

- 10 A CE amplifier is driven by a voltage source of internal resistance $R_s = 800\Omega$ and the load impedance of $R_L = 1000\Omega$. The h-parameters are $h_{ie} = 1\text{k}$, $h_{fe} = 50$, $h_{oe} = 25\mu\text{A/V}$ and $h_{re} = 2 \times 10^{-4}$. Find current gain, voltage gain, input impedance and output impedance using exact analysis and approximate analysis. L1 12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations January 2022
C AND DATA STRUCTURES
(CSE)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- 1 a) Explain the general form of a C program with an example. L2 6M
b) What is an expression? Explain different categories of expressions. L2 6M

OR

- 2 a) List out unconditional control statements. Explain the difference among them. L2 6M
b) Write a program to find the factorial of a given number. L3 6M

UNIT-II

- 3 a) What is an array? What are the advantages of arrays over a ordinary variables? How arrays are declared and initialized? L2 6M
b) Write a program for finding the largest number in an array. L3 6M

OR

- 4 Write about categories of functions with examples. L3 12M

UNIT-III

- 5 a) Define structure and give the general syntax for structure. Write suitable example program. L1 6M
b) Give difference between the structures and union. L4 6M

OR

- 6 a) Define union and give the general syntax for union. Write suitable example program. L2 6M
b) How to declare and initialize a structure with examples? L4 6M

UNIT-IV

- 7 What is a stack? What are various operations that can be performed on them? Explain with an example. L2 12M

OR

- 8 a) What is data structure? Explain the linear and non linear data structure in detail. L2 6M
b) What are the advantages and disadvantages of stack and queue. L2 6M

UNIT-V

- 9 Explain briefly about various types of linked lists with suitable examples. L2 12M

OR

- 10 Write the various operations of double linked list in detail. L3 12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations January 2022
PYTHON PROGRAMMING

(CSE)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- 1 (a) Explain about the Single-Valued data types in python 6M
(b) What is Indentation? Explain with example. 6M

OR

- 2 (a) Enumerate the list and its methods with example. 6M
(b) Elucidate the string and its methods with example. 6M

UNIT-II

- 3 Explain in detail about Control flow structures in python. 12M

OR

- 4 (a) Write a python program to find the given number is odd or even. 6M
(b) Explain break and continue statement with the help of for loop with an example. 6M

UNIT-III

- 5 (a) Differentiate keyword and default arguments. 6M
(b) Differentiate global and local variables. 6M

OR

- 6 (a) Write a function to display ASCII Code of entered character 6M
(b) Describe how an object is passed as parameter to a method 6M

UNIT-IV

- 7 What is module? How to create that module explain with program. 12M

OR

- 8 What is user defined exception and explain with example program. 12M

UNIT-V

- 9 (a) What is turtle graphics in Python? How do you fill a turtle in Python with color? 6M
(b) Write python program to display equilateral triangle using turtle graphics. 6M

OR

- 10 What is mean by Functional Programming? Write about map and filter in Python. 12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations January 2022
BUILDING MATERIALS & CONSTRUCTION
(CIVIL ENGINEERING)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

1 Write about manufacturing and defects of bricks. L1 12M

OR

- 2 (a) Explain the defects caused due to seasoning of timber. L3 6M
(b) What are the objects of preservation of timber. L1 6M

UNIT-II

3 How the ordinary Portland cement will be manufactured by using wet and dry process. L2 12M

OR

4 In detail explain about mixing and vibration of concrete. L1 12M

UNIT-III

5 What are the mechanical properties of coarse aggregate? L1 12M

OR

- 6 (a) Briefly explain about composition of oil paint. L4 6M
(b) What is the procedure for preparation of paint, Explain briefly? L1 6M

UNIT-IV

7 What are the loads acting on foundation of a building. L2 12M

OR

8 In detail explain about bond formation in brick masonry with neat sketch. L2 12M

UNIT-V

9 What are the different types of mortars used] for plastering explain in detail? L1 12M

OR

10 Explain in detail about different terms are used? L3 12M

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SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations January 2022

KINEMATICS OF MACHINERY

(MECH)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- 1 Describe the classification of the kinematics pairs with neat sketch and all the aspect. L4 12M

OR

- 2 What are the practical applications of inversions of the single slider crank chain? Explain all with neat sketch. L1 12M

UNIT-II

- 3 Describe the Ackerman steering gear of an automobile, with neat sketch. L2 12M

OR

- 4 (a) Sketch and explain the working of Grasshopper straight line mechanism L2 6M

- (b) Sketch and Describe the working of Peaucellier mechanism L1 6M

UNIT-III

- 5 What do you understand by the instantaneous centre of rotation in kinematic of machines? Answer briefly L1 12M

OR

- 6 What are the different types of motion and how the follower can move in it? L1 12M

UNIT-IV

- 7 Draw the displacement, velocity and acceleration diagrams for a follower when it moves with simple harmonic motion. L3 12M

OR

- 8 Draw the displacement, velocity and acceleration diagrams for a follower when it moves with uniform Acceleration and retardation. L3 12M

UNIT-V

- 9 Explain the classification of gears with neat sketches L3 12M

OR

- 10 (a) What do you understand by 'gear train'? Discuss the various types of gear trains. L1 6M

- (b) How the velocity ratio of epicyclic gear train is obtained by tabular method? L1 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations January 2022
ELECTRICAL MACHINES-I

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- 1 Explain the basic principle of operation of a DC Generator with a simple loop generator. L2 12M

OR

- 2 A DC Compound Generator has 110V as terminal voltage. The armature resistance, shunt field Resistance and series field resistance are 0.06Ω , 25Ω and 0.04Ω respectively. The load consists of 200A which rated at 55W. Find the total emf generated and armature current when the machine is connected as (i) Long Shunt (ii) Short Shunt L4 12M

UNIT-II

- 3 Explain in detail about the types of D.C motors. Also mention their applications L2 12M

OR

- 4 Explain the armature voltage and field flux control methods for the Speed control of a DC Motor L3 6M

UNIT-III

- 5 Explain Swinburne's test on DC machines? What are its advantages and disadvantages L3 12M

OR

- 6 Describe Hopkinson test in detail. What are its advantages and disadvantages L2 12M

UNIT-IV

- 7 (a) Explain the effect of variations of frequency and supply voltage losses L3 6M

- (b) Write a short notes on practical Transformer L1 6M

OR

- 8 (a) With relevant phasor diagrams, explain the operation of a practical single phase transformer under no load condition. L1 6M

- (b) A 230/2300V transformer takes a load current of 6.5A and absorbs 187W. If the resistance of primary is 0.06Ω , find (a) Core loss (b) no load power factor (c) active component of current and (d) magnetizing current. L3 6M

UNIT-V

- 9 Explain the Scott connection of two single phase transformers with neat circuit diagram. L3 12M

OR

- 10 Discuss how you will perform O.C and S.C tests on a single phase transformer in the Laboratory. L5 12M

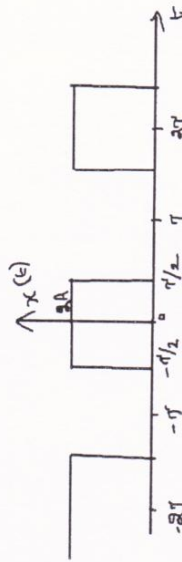
Time: 3 Hours

Max. Marks: 60
Answer one question from each unit (5 x 12 = 60 Marks)

- UNIT-I**
- Define and sketch the following signals.
 - Unit Step signal
 - Unit impulse signal
 - Signum function
 - If unit step signal is represented by $u(t)$ then draw the following signals (i) $2u(t-4)$ (ii) $4u(t+4)$ (iii) $u(t) - u(t-1)$
 - OR

 - Explain the following systems with an example.
 - Static and dynamic systems
 - Stable and Unstable system
 - Find and Justify whether the system $y(n) = \cos [k(n)]$ is
 - Static or dynamic
 - Linear or Non-linear
 - Causal or Non-Causal
 - UNIT-II**

 - What is the importance of Fourier Series? Write short notes on
 - Dirichlet's conditions for Fourier series.
 - Find the Exponential Fourier series for the following waveform.



- OR
- Prove the following properties of Fourier Transform.
 - Linearity
 - Time Differentiation
 - Convolution in time domain
 - Find the Fourier transform of the following.
 - Real exponential $x(t) = e^{-at}u(t)$ $a > 0$
 - $x(t) = e^{at}u(-t)$ $a > 0$
 - UNIT-III**

 - Derive the expression for the Impulse response of a Linear Time Invariant System.
 - Discuss the filter characteristics of linear systems.
 - OR

 - Explain the concept of convolution in time domain.
 - Explain the concept of frequency convolution.

UNIT-IV

- Find Laplace transform & ROC of the signal $x(t) = e^{-at}u(t) + e^{-bt}u(t)$ 6M
 - Find the unilateral Laplace Transform of the following signals
 - $u(t)$ L3
 - $\cos w_0 t$ L3
- OR

 - Define random variable and explain the concept of random variable. L1
 - When two dice are thrown, find the probability of getting the sums of 10 or 11? L3
- UNIT-V**

 - Derive the relation between cross power density spectrum and cross correlation function of a random process. L2
 - Prove that PSD and autocorrelation function of a random process form a Fourier transform pair. L2

OR

- A random process defined as $X(t) = A \sin(\omega t + \phi)$, where A is a constant and ϕ is a random uniformly distributed over $(-\pi, \pi)$. Check $x(t)$ for stationary. L2
 - Explain when the two different random processes are called statistically independent. L2

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations January 2022
DATABASE MANAGEMENT SYSTEMS

(CSE)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- 1 Briefly explain about Views of data L1 6M
Explain about various data models. L3 6M

OR

- 2 (a) Explain about ER model and Component of ER Diagram L3 6M
(b) Write about logical database design (ER to Relational) with suitable examples. L2 6M

UNIT-II

- 3 (a) Distinguish between two set theoretic operations of relational algebra with an example. L1 6M
(b) To establish the WHERE, ANY, AS and ALL sub queries with example L3 6M

OR

- 4 (a) Write a nested query to find the names of sailors who have reserved both a red and Green boat? L3 6M
(b) Write a nested query to find the names of sailors who have reserved all boats L3 6M

UNIT-III

- 5 Define decomposition and how does it address redundancy? Discuss the problems that may be caused by the use of decompositions? L2 12M

OR

- 6 (a) Explain the following with suitable example. (i) Full functional dependency. (ii) Partial dependency L2 6M
(b) What do you mean by Normalization? Explain BCNF, 3NF and 2NF with a suitable example. L3 6M

UNIT-IV

- 7 (a) Define a Transaction? List the properties of transaction L1 6M
(b) Write briefly about serializability with example. L4 6M

OR

- 8 (a) Discuss different phases (states) of transaction L2 6M
(b) Define Schedule? What is a serial schedule L1 6M

UNIT-V

- 9 (a) Explain how recovery is done using undo logging and redo logging. L3 6M
(b) Which level of RAID is best? Why L1 6M

OR

- 10 (a) Explain about failure with loss of non-volatile storage L3 6M
(b) What are the methods that are used in log based recovery L1 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations Dec 2021/January 2022
RELATIONAL DATABASE MANAGEMENT SYSTEM
(Common to CE, EEE & ME)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- 1 (a) Define Database. Discuss about applications of Database Systems. L1 6M
(b) Discuss about the purpose of Database Systems? L6 6M

OR

- 2 (a) Implement the DDL Commands - Table Creation, Altering the table structures, truncating a table and dropping a table. L1 6M
(b) Write a short note on relational model with an example. L1 6M

UNIT-II

- 3 Write about relational algebra? Discuss about different operators used in algebra. L2 12M

OR

- 4 (a) Write a short note on Weak Entities and give suitable example. L2 6M
(b) Write about the different symbols used in ER diagrams. L2 6M

UNIT-III

- 5 Explain about Union, Intersect, and Except SQL query with example. L2 12M

OR

- 6 Discuss about set comparison operators? L1 12M

UNIT-IV

- 7 Explain about Fifth Normal form with an example. L2 12M

OR

- 8 Explain about properties of decomposition and fifth normal form with an example. L2 12M

UNIT-V

- 9 (a) Write short note on Buffer management for management of data. L3 6M
(b) Explain in detail about ISAM L4 6M

OR

- 10 Classify various levels of RAID with neat diagrams L4 12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations January 2022

Linux Programming
(ECE)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- 1 Write about the operations that can be performed on both directories and file. L2 12M

OR

- 2 (a) Explain the security levels provided in Unix environment. How to change permissions of a file? L4 6M
(b) Brief umask command. L1 6M

UNIT-II

- 3 Explain Variables with its characteristics and options. L2 12M

OR

- 4 (a) Discuss about Standard Streams? Explain Briefly. L2 6M
(b) Discuss pipe and tee command with suitable example. L2 6M

UNIT-III

- 5 What is mail? Explain it in detail. L1 12M

OR

- 6 List all the commands associated with send mail with its actions performed. L1 6M

UNIT-IV

- 7 Describe the overview of Sed and awk ? L2 12M

OR

- 8 List and explain the expressions involved in Korn shell. L1 12M

UNIT-V

- 9 Detail about the variables associated with C shell. L4 12M

OR

- 10 List and explain the expressions involved in C shell. L2 12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations January 2022
MANAGEMENT SCIENCE
(CSE)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- 1 Define Management. Describe nature and importance of Management L1 12M

OR

- 2 (a) Briefly explain the Weber 's Ideal Bureaucracy. L5 6M
(b) Examine the Span of control. L5 6M

UNIT-II

- 3 Explain the stages in Product Life Cycle with the help of diagram. L6 12M

OR

- 4 Explain the concept of work study and its types L5 12M

UNIT-III

- 5 Define training? Explain the types of the job training methods. L5 12M

OR

- 6 (a) Discuss the wage and salary administration L6 6M
(b) Evaluate on-the job training. L5 6M

UNIT-IV

- 7 Identify and discuss the stages in the process of strategy formulation and implementation. L4 12M

OR

- 8 Discuss about environmental scanning and explain the process of environmental scanning L6 12M

UNIT-V

- 9 Explain the enterprise resource planning and its utilities in management. L5 12M

OR

- 10 What is Bench Marking and how does an organization derive benefit from such initiatives. L1 12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations January 2022
Network Theory

(ECE)

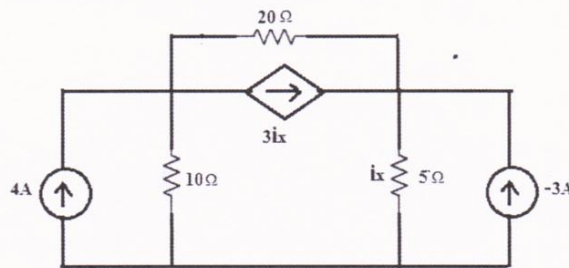
Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

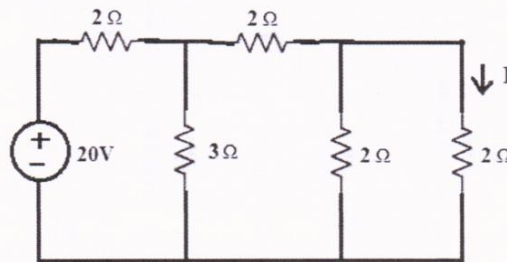
- 1 a) Determine i_x for the following network. L4 6M



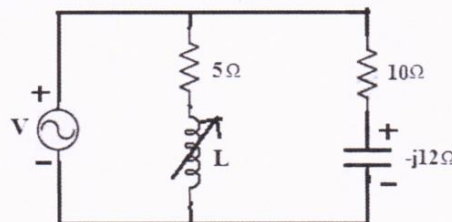
- b) Explain about source transformation briefly L2 6M

OR

- 2 a) State and prove Milliman's theorem. L2 6M
b) Verify reciprocity theorem for the network shown in below figure. L4 6M

**UNIT-II**

- 3 a) Explain about Parallel resonance with phasor diagrams. L2 6M
b) Find the value of „L“ at which the circuit resonates at a frequency of 1000 rad/sec in the circuit Shown in the figure. L4 6M



OR

- 4 Explain about Constant-K low-pass filter in detail. L3 12M

UNIT-III

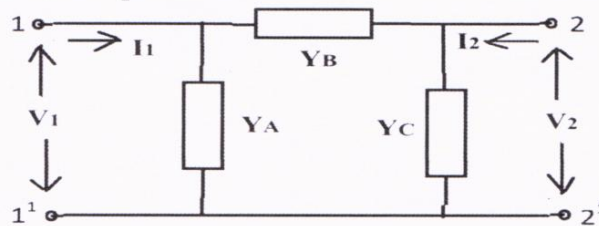
- 5 a) Derive the Laplace Transform of Series RL Circuit. L2 6M
b) A series RC circuit consists of a resistor of 10Ω and capacitor of 0.1 F with a constant voltage of 20v, is applied to the circuit at $t=0$. Obtain the current equation. Determine the voltage across the resistor and the capacitor. L4 6M

OR

- 6 a) Derive the Laplace Transform of Series RC Circuit. L2 6M
 b) A series RL circuit with $R=30\Omega$ and $L=15H$ has a constant voltage $V=60v$ applied at $t=0$. Determine the current "I", voltage across resistor and voltage across inductor. L4 6M

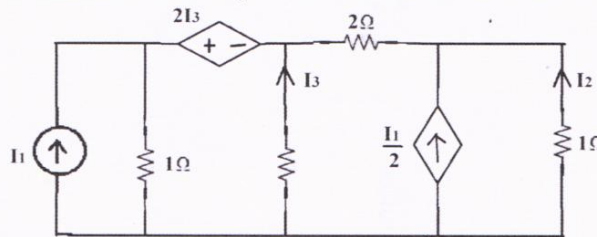
UNIT-IV

- 7 a) Explain about h-parameters in terms of y-parameters. L2 6M
 b) Find the Short-circuit parameters for the circuit shown in figure. L4 6M



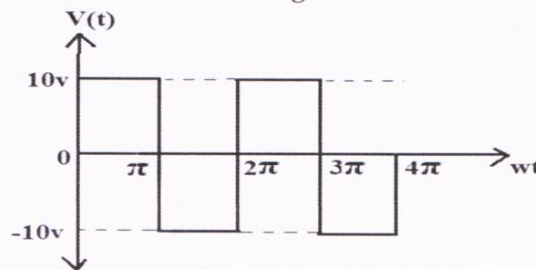
OR

- 8 a) Derive the expressions for Z-parameters in terms of ABCD-parameters. L2 6M
 b) Find the current transfer ratio I_2/I_1 for the network shown on figure. L2 6M



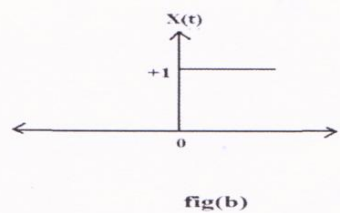
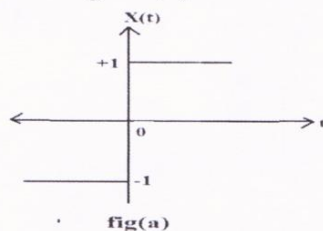
UNIT-V

- 9 a) Derive the Exponential form of Fourier series. L2 6M
 b) Obtain the Fourier series for the following waveform shown in figure. L4 6M



OR

- 10 Determine the Fourier transforms of the following waveforms shown in figure (a) and figure (b). L4 12M



SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations January 2022
STRENGTH OF MATERIALS
(Mechanical Engineering)

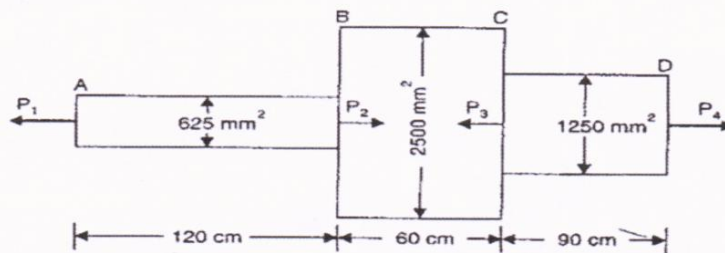
Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- 1 A member ABCD is subjected to point loads P_1 , P_2 , P_3 and P_4 as shown in figure. L3 12M
Calculate the force P_2 necessary for equilibrium, if $P_1 = 35$ kN, $P_3 = 425$ kN and $P_4 = 100$ kN. Determine the total elongation of the member, assuming the modulus of elasticity to be 2.4×10^5 N/mm²

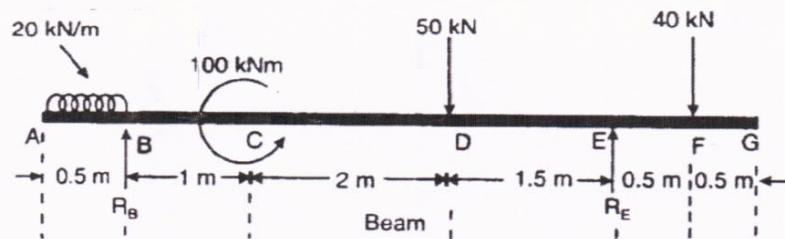


OR

- 2 Determine the diameter of a bolt which is subjected to an axial pull of 10 kN together L3 12M
with a transverse shear force of 5.5 kN using :
(i) Maximum principal stress theory.
(ii) Maximum principal strain theory.
Given the elastic limit in tension = 250 N/mm², factor of safety = 4 and Poisson's ratio = 0.3.

UNIT-II

- 3 Construct the bending moment and shear force diagrams for the beam shown in the L3 12M
figure.



OR

- 4 A beam is simply supported and carries a uniformly distributed load of 50 kN/m run L3 12M
over the whole span. The section of the beam is rectangular having depth as 600 mm.
If the maximum stress in the material of the beam is 150 N/mm² and moment of inertia of the section is 6×10^8 mm², find the span of the beam.

UNIT-III

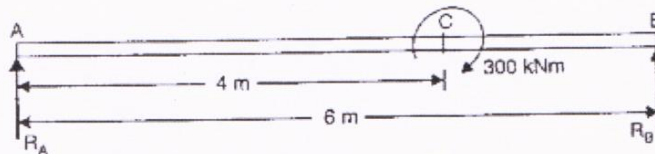
- 5 Derive shear stress distribution formula for triangular section with a neat sketch. L2 12M

OR

- 6 A hollow shaft, having an inside diameter 60% of its outer diameter, is to replace a solid shaft transmitting the same power at the same speed. Calculate the percent-age saving in material, if the material to be used is also the same. L3 12M

UNIT-IV

- 7 A horizontal beam AB is simply supported at A and B, 6 m apart. The beam is subjected to a clockwise couple of 250 kN-m at a distance of 4 m from the left end as shown in figure below. If $E = 2.1 \times 10^5 \text{ N/mm}^2$ and $I = 2 \times 10^8 \text{ mm}^4$, determine : L3 12M
- (i) Deflection at the point where couple is acting and
(ii) The maximum deflection.



OR

- 8 a) Write the assumptions made in the Euler's column theory. L2 4M
b) Write the end conditions for long columns and state the difference between long columns and short columns. L2 8M

UNIT-V

- 9 A cylindrical thin drum 80 cm in diameter and 3 m long has a shell thickness of 1 cm. If the drum is subjected to an internal pressure of 2.5 N/mm^2 , Take $E = 2 \times 10^5 \text{ N/mm}^2$ Poisson's ratio 0.25 L3 12M
- Determine
- (i) change in diameter
(ii) change in length and
(iii) Change in volume.

OR

- 10 Determine the maximum and minimum hoop stress across the section of a pipe of 350 mm internal diameter and 120 mm thick, when the pipe contains a fluid at a pressure of 8.5 N/mm^2 . Also sketch the radial pressure and hoop stress distribution across the section. L3 12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Supplementary Examinations Dec-2021/January 2022

ELECTROMAGNETIC THEORY AND TRANSMISSION LINES
(ECE)

Time: 3 hours

Max.Marks: 60

- PART-A**
(Compulsory Questions)
Answer the following: (5 X 2 = 10 Marks)
- Define Coulomb's law.
 - State Biot-Savart Law
 - What is meant by displacement current.
 - What is meant by plane wave.
 - What are the applications of transmission lines.

L1 2M
L1 2M
L2 2M
L2 2M
L1 2M

PART-B
(Answer all five units, 5 x 10 = 50 Marks)

- UNIT - I**
- Define Electric Potential. Find the electric potential for a point charge is located at origin. L1 10M
 - Find the electric field at a point P located with a distance of r from an infinite sheet with uniform surface charge density of ρ_s C/m². L1 5M
 - A Point Charge of 20nC is Located at the Origin. Determine the Magnitude and direction of the electric field intensity at the Point (1,3,-4). L1 5M
- UNIT - II**
- Determine the Magnetic Field Density due to Infinite line Current by applying Ampere's Circuit law. L5 10M
- OR**
- Explain about magnetic scalar and vector potential for Magneto-statics. L2 10M
 - Determine the Expressions for inconsistency of Ampere's law. L5 10M
- OR**
- An antenna radiates in free space and $H = 50 \cos(1000t - 5y) \hat{x}$ A/m. Calculate α , β and E. L3 5M
 - Translate the Maxwell's equations into word statement. L2 5M
- UNIT - IV**
- Determine the expression for intrinsic impedance and propagation constant in a good conductor. L5 10M
- OR**
- Explain the followings with an expression. L2 10M
 - Linear polarization
 - Circular polarization
 - Elliptical polarization

UNIT - V

- Evaluate the equation for Characteristic Impedance of a Transmission line. L5 5M
 - A telephone line has the following parameters: $R = 30 \Omega/\text{km}$, $G = 0$, $L = 100 \text{mH}/\text{km}$, $C = 2 \mu\text{F}/\text{m}$. At 1kHz, calculate the characteristic impedance, propagation constant and velocity of the signal. L3 5M
- OR**
- A lossless transmission line with $Z_0 = 50 \Omega$ is 30m long and operates at 3MHz. L3 10M
The line is terminated with a load $Z_L = 70 + j50 \Omega$, If $v = 0.6c$ on the line.
Compute reflection coefficient, standing wave ratio and Input impedance, load impedance, SWR and complex reflection coefficient
(i) without using smith chart (ii) Using smith chart

SIDDARTH INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations January 2022
Control Systems
(Common to ECE & EEE)

Time: 3 hours

Max.Marks: 60

PART - A

(Compulsory Questions)

Answer the following: (5 X 2 = 10 Marks)

1. (a) What is feedback? What type of feedback is employed in control systems?
(b) List the time domain specifications?
(c) Define root locus?
(d) What is phase and gain cross over frequency?
(e) Define state variable?

L2 2M
L1 2M
L3 2M
L2 2M
L2 2M

PART - B

(Answer all five units, 5 x 10 = 50 Marks)

UNIT - I

2. For the mechanical system shown in Fig, determine the transfer functions $\frac{X_1(s)}{F(s)}$ & $\frac{X_2(s)}{F(s)}$

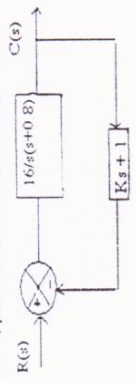


OR

3. (a) Compare open loop and closed loop control systems based on different aspects?
(b) List the properties of signal flow graph.

UNIT - II

4. A positional control system with velocity feedback shown in figure. What is the response $c(t)$ to the unit step input. Given that damping ratio=0.5. Also determine rise time, peak time, maximum overshoot and settling time.



OR

5. The system has $G(s) = \frac{K}{s(1+sT)}$ with unity feedback where K & T are constant. Determine the factor by which gain 'K' should be multiplied to reduce the overshoot from 75% to 25%?

UNIT - III

6. With the help of Routh's stability criterion find the stability of the following systems represented by the characteristic equations:
(a) $s^5 + s^4 + 2s^3 + 2s^2 + 3s + 5 = 0$
(b) $9s^5 - 20s^4 + 10s^3 - s^2 - 9s - 10 = 0$

L.5 10M

OR

7. Sketch the root locus of the system whose open loop transfer function is

L.3 10M

$$G(s)H(s) = \frac{K(s+9)}{s(s^2+4s+11)}$$

UNIT - IV

8. Sketch the Bode plot for the following transfer function

L.3 10M

$$G(s)H(s) = \frac{K e^{-0.1s}}{s(s+1)(1+0.15s)}$$

OR

9. A system is given by $G(s)H(s) = \frac{(4s+1)}{s^2(s+1)(2s+1)}$. Sketch the nyquist plot and determine the stability of the system.

L.3 10M

UNIT - V

10. (a) State the properties of State Transition Matrix.
(b) Diagonalize the following system matrix $A = \begin{pmatrix} 4 & 1 & -2 \\ 1 & 1 & 0 \\ 1 & -1 & 3 \end{pmatrix}$

L.1 5M
L.3 5M

OR

11. Obtain a state model for the system whose Transfer function is given by

L.2 10M

$$G(s)H(s) = \frac{(7s^2+12s+8)}{(s^3+6s^2+11s+9)}$$

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary Examinations DEC 2021
COMPUTER NETWORKS
(CSE)

Time: 3 hours

Max.Marks: 60

PART-A
(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)

- | | | |
|---|----|----|
| (a) Name the functions of network layer | L1 | 2M |
| (b) Describe the process of stop and wait protocol. | L2 | 2M |
| (c) Write about broadcasting. | L3 | 2M |
| (d) Distinguish between contention and congestion. | L4 | 2M |
| (e) List out the four main properties of HTTP. | L1 | 2M |

PART- B
(Answer all five units, 5 x 10 =50 Marks)

UNIT – I

- | | | |
|---|----|-----|
| 2. Compare OSI and TCP/IP Network models. | L4 | 10M |
|---|----|-----|

OR

- | | | |
|---|----|-----|
| 3. Give the description of wireless transmission media. | L2 | 10M |
|---|----|-----|

UNIT – II

- | | | |
|--|----|-----|
| 4. Discuss bit-oriented HDLC Protocol with the elaborative explanation of its frames | L2 | 10M |
|--|----|-----|

OR

- | | | |
|---|----|-----|
| 5. Extend about the Elementary data link protocols. | L2 | 10M |
|---|----|-----|

UNIT – III

- | | | |
|--|----|-----|
| 6. Sketch and explain in detail about IPV4 protocol. | L3 | 10M |
|--|----|-----|

OR

- | | | |
|--|----|-----|
| 7. Compare Virtual circuit network and Datagram network with diagrams. | L4 | 10M |
|--|----|-----|

UNIT – IV

- | | | |
|--|----|-----|
| 8. Illustrate the different Primitives used for transport service. Elaborate them. | L2 | 10M |
|--|----|-----|

OR

- | | | |
|---|----|-----|
| 9. Correlate the various timers used by TCP to perform its various operations | L4 | 10M |
|---|----|-----|

UNIT – V

- | | | |
|---|----|-----|
| 1. Discuss the features of HTTP and explain how HTTP works. | L2 | 10M |
|---|----|-----|

- | | | |
|---|----|-----|
| 11. Discuss about File Transfer Protocol with neat diagram. | L2 | 10M |
|---|----|-----|

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Supplementary Examinations January 2022

CAD/CAM

(MECH)

Time: 3 hours

Max.Marks: 60

PART-A

(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)
- | | | |
|---|----|----|
| (a) Why should we go for CAD? | L1 | 2M |
| (b) What are the Fundamentals of solid modeling. | L1 | 2M |
| (c) What are all the problems encountered with NC system. | L1 | 2M |
| (d) Define Part families. | L1 | 2M |
| (e) Define the MRP-I and MRP-II. | L1 | 2M |

PART- B

(Answer all five units, 5 x 10 =50 Marks)

UNIT – I

2. Discuss clearly the functions of a graphics package. L4 10M

OR

3. Discuss Brief about the Co-ordinate systems L6 10M

UNIT – II

4. Explain the Constructive Solid Geometry (CSG) method to create models. L5 10M

OR

5. Explain about Parametric and non-Parametric representations. L2 10M

UNIT – III

6. Illustrate Brief about NC motion control systems. L2 10M

OR

7. Explain about various NC procedure and Explain types of Numerical Control L3 10M

UNIT – IV

8. Write brief notes on Group Technology and Parts classification and coding L5 10M

OR

9. Explain production flow analysis (PFA) and Benefits of Group Technology L3 10M

UNIT – V

10. Explain the Retrieval type system with neat sketch and explain the Benefits of CAPP? L2 10M

OR

11. What is CAPP? Explain the any one type of Capp with neat sketches. L1 10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary Examinations DEC 2021/JAN-2022
GEOTECHNICAL ENGINEERING
(CIVIL)

Time: 3 hours

Max.Marks: 60

PART-A**(Compulsory Questions)**

1. Answer the following; (5 X 2 = 10 Marks)
- State Darcy's law.
 - Compression index, Expansion index & Recompression index
 - What are the constituents on which shear strength of soil depends upon?
 - Mention various uses of Taylor's stability number.
 - List out various types of soil samplers.

L1	2M
L4	2M
L1	2M
L1	2M
L1	2M

PART-B**(Answer all five units, 5 x 10 =50 Marks)****UNIT – I**

2. Explain in detail the Indian Standard classification System and list out group symbols in detail? L3 10M

OR

3. Explain the coefficient of permeability in laboratory by constant head method with neat sketch. L3 10M

UNIT – II

4. Define consolidation and various types of consolidations. L2 10M

OR

5. Explain the procedure of Sand replacement method with neat sketch. L3 10M

UNIT – III

6. Explain vertical stress under line load, strip load, circular load and rectangular area L1 10M

OR

7. Explain the principle of the direct shear test. What are the advantages of this test? What are its Limitations? L3 10M

UNIT – IV

8. With the help of a neat sketch explain in detail about friction circle method? L2 10M

OR

9. Give the step by step procedure of analyzing stability of a finite slope using Swedish circle method. L2 10M

UNIT – V

10. Describe with a neat sketch how will you carry out the wash boring method of soil exploration. L1 10M

11. Give a detailed account on how Standard Penetration Test is conducted. What are the relevant corrections applied to SPT number? L4 10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester (R18) Supplementary Examinations DEC 2021/JAN-2022
DESIGN AND ANALYSIS OF ALGORITHMS
(CSE)

Time: 3 hours

Max.Marks: 60

PART-A**(Compulsory Questions)**

1. Answer the following; (5 X 2 = 10 Marks)

- | | | |
|--|----|----|
| (a) Write the For LOOP general format. | L1 | 2M |
| (b) List out the formulas for Stassen's matrix multiplication. | L1 | 2M |
| (c) Define optimal solution. | L1 | 2M |
| (d) State Sum of Subsets problem. | L1 | 2M |
| (e) Define NP. | L1 | 2M |

PART- B**(Answer all five units, 5 x 10 =50 Marks)****UNIT - I**

2. Explain two types of recurrences in detail with suitable example. L3 10M

OR

- | | | |
|--|----|----|
| 3. (a) Determine in steps of Union and Find algorithms with example. | L5 | 5M |
| (b) Explain space complexity in detail. | L2 | 5M |

UNIT - II

4. What is divide and conquer strategy? Explain the working strategy of Binary Search and find element 60 from the below set by using the above technique: { 10, 20, 30,40,50, 60,70}. Analyze time complexity for binary search. L2 10M

OR

5. Summarize an algorithm for quick sort. Provide a complete analysis of quick sort for given set of numbers 12, 33, 23, 43, 44, 55, 64, 77and 76. L2 10M

UNIT - III

6. Explain any one application of greedy method with an example? L2 10M

OR

7. Build any one application of dynamic programming with an example. L6 10M

UNIT - IV

8. Explain sum of subsets by using backtracking with an example. L5 10M

OR

9. Simplify 0/1 knapsack problem and design an algorithm of LC Branch and Bound and find the solution for the knapsack instance of
- $n = 4, (p_1, p_2, p_3, p_4) = (10, 10, 12, 18), (w_1, w_2, w_3, w_4) = (2, 4, 6, 9)$
- and
- $M = 15$
- . L4 10M

UNIT - V

10. State and explain cook's theorem? L2 10M

11. Construct the non-deterministic sorting algorithm and also analyze its complexity. L6 10M

SIDDARATHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester (R18) Supplementary Examinations DEC 2021/JAN-2022
DESIGN OF MACHINE ELEMENTS-I
(MECH)

Time: 3 hours

Max.Marks: 60

PART-A
(Compulsory Questions)

Answer the following: (5 X 2 = 10 Marks)

1. (a) Define Factor of safety
(b) What is brittle fracture and What is ductile fracture?
(c) What is bolt of uniform strength?
(d) What are the main functions of the knuckle joints?
(e) What are the types of keys?

L1 2M
L2 2M
L1 2M
L1 2M
2M

PART-B
(Answer all five units, 5 x 10 = 50 Marks)

UNIT - I

2. (a) What do you mean by preferred numbers and explain the applications?
(b) What is meant by factor of safety? Explain how it can be used in design applications.

L1 5M
L1 5M

OR

3. (a) Derive an expression for the impact stress induced due to a falling load.
(b) Write the bending stress relation and draw the diagram.

L5 5M
L2 5M

UNIT - II

4. Explain stress concentration in detail and various methods to reduce stress concentration in machine members?

L2 10M

OR

5. A machine component is subjected to a flexural stress which fluctuates between + 300 MN/m² and - 150 MN/m². Determine the value of minimum ultimate strength according to 1. Gerber relation; 2. Modified Goodman relation; and 3. Soderberg relation. Take yield strength = 0.55 Ultimate strength; Endurance strength = 0.5 Ultimate strength; and actor of safety = 2.

L2 10M

UNIT - III

6. (a) What is the difference between caulking and fullering? Explain with the help of neat sketches?
(b) Explain briefly the method of riveting?

L1 5M
L3 5M

OR

7. (a) Show by neat sketches the various ways in which a riveted joint may fail?
(b) Classify the rivet heads for general purposes

L1 5M
L2 5M

- UNIT - IV
8. Design a sleeve and cotter joint to resist a tensile load of 60 kN. All parts of the joint are made of the same material with the following allowable stresses: Tensile stress = 60 MPa, shear stress = 70 MPa, and compressive stress = 125 MPa.

OR

L2 10M

UNIT - V

9. A hollow shaft has greater strength and stiffness than solid shaft of equal weight. Explain.
10. How are the keys classified? Draw neat sketches of different types of keys and state their applications.
11. Design and draw a cast iron flange coupling for a mild steel shaft transmitting 90 kW at 250 r.p.m. The allowable shear stress in the shaft is 40 MPa and the angle of twist is not to exceed 1° in a length of 20 diameters. The allowable shear stress in the coupling bolts is 30 MPa.

L1 10M
L2 10M

5/1/22
RN

SIDDARATHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Supplementary Examinations January 2022
DIGITAL SIGNAL PROCESSING
(Common to ECE & EEE)

Time: 3 hours

Max.Marks: 60

PART-A**(Compulsory Questions)**

Answer the following: (5 X 2 = 10 Marks)

1. (a) Define DFT and IDFT. L2 2M
- (b) How one can design digital filters from analog filters? L1 2M
- (c) What conditions are to be satisfied by the impulse response of an FIR system in order to have a linear phase? L2 2M
- (d) What is meant by input quantization error? L1 2M
- (e) Explain about Multiple Access Memory. L2 2M

PART-B**(Answer all five units, 5 x 10 =50 Marks)****UNIT - I**

2. (a) Find the DFT of a sequence $x(n)=[1, 1, 0, 0]$ and find the IDFT of $Y(k)=[1, 0, 1, 0]$. L3 5M
- (b) State and prove convolution property of DFT. L3 5M

OR

3. Compute the DFT of the given sequence x using DIT FFT algorithm. L3 10M

$[n] = [1, -1, 1, -1, 1, -1, 1, -1]$. Show the intermediate result on the flow graph.

UNIT - II

4. (a) Compare and Contrast Butterworth and Chebyshev approximations L4 5M
- (b) Realize the following IIR system in the direct form I, direct form II and parallel forms $H(z)=1/(1+az^{-1})(1-bz^{-1})$. L3 5M

OR

5. (a) With an example explain the design procedure for Butterworth filter. L5 5M
- (b) Give the direct form-I and direct form-II realizations for the transfer function: $H(z) = 0.0034 + 0.0106z^{-2} + 0.0025z^{-4} + 0.0149z^{-6}$. L2 5M

UNIT - III

6. (a) Explain the need for the use of window sequence in the design of FIR filter. Describe the window sequence generally used and compare the properties. L2 5M
- (b) Explain Direct form realization technique for FIR filter. L2 5M

OR

7. (a) Design a High Pass FIR filter whose cut-off frequency is L2 L5 5M

radians/sec and $N = 9$ using Hamming Window.

- (b) Implement Linear phase FIR filter structure for 'N' is Even. L3 5M
- UNIT - IV**
8. The output signal of an A/D converter is passed through a first order low pass filter with transfer function $H(Z) = (1-a)z^{-1} / (z-a)$ for $0 < a < 1$. Find the steady state output noise power due to quantization at the output of the digital filter L3 10M
- OR**
9. (a) Draw and explain the power density functions for truncation and rounding L2 5M
 - (b) Discuss in detail the errors resulting from rounding and truncation L2 5M
- UNIT - V**
10. (a) What are the architectural features of TMS320C5x DSP? L1 5M
 - (b) Explain what is meant by instruction pipelining L2 5M
- OR**
11. (a) What are the special addressing modes of DSP? Explain. L2 5M
 - (b) Draw the pipelined MAC configuration to perform convolution operation and explain with neat timing diagrams. L2 5M

7/1/22 RN

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary Examinations January 2022
COMPILER DESIGN
(CSE)

Time: 3 hours

Max.Marks: 60

PART-A**(Compulsory Questions)**

1. Answer the following; (5 X 2 = 10 Marks)
- | | | | |
|-----|--|----|----|
| (a) | List the various phases of a compiler. | L1 | 2M |
| (b) | Define LL (1). | L2 | 2M |
| (c) | What is mean by shift reduce parsing? | L1 | 2M |
| (d) | Define symbol table. | L2 | 2M |
| (e) | Define Dead-code elimination with example. | L2 | 2M |

PART- B**(Answer all five units, 5 x 10 =50 Marks)****UNIT – I**

2. Explain the phases of a compiler with neat diagram? L3 10M

OR

3. Explain about Language Processor in compiler Design? L2 10M

UNIT – II

4. Explain Error recovery in predictive parsing with an Example. L2 10M

OR

5. Consider the grammar $E \rightarrow E+T/T, T \rightarrow T * F / F, F \rightarrow (E) | id$ Construct predictive parsing table and check given grammar is LL(1) or not? L4 10M

UNIT – III

6. Construct CLR Parsing table for the given grammar $S \rightarrow CC, C \rightarrow aC/d$ L3 10M

OR

7. Describe the evaluation order of SDT with an example. L2 10M

UNIT – IV

8. Draw the format of Activation Record in stack allocation and explain each field in it. L4 10M

OR

9. Describe the Storage Organization with simple examples. L2 10M

UNIT – V

10. Explain the target machine architecture. L3 10M

11. Describe about global data flow analysis. L2 10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary Examinations DEC 2021
MACHINE TOOLS
(MECH)

Time: 3 hours

Max.Marks: 60

PART-A**(Compulsory Questions)**

1. Answer the following; (5 X 2 = 10 Marks)

- | | | | |
|-----|------------------------------------|----|----|
| (a) | Define cutting ratio. | L1 | 2M |
| (b) | Classify types of cutting fluids. | L2 | 2M |
| (c) | List the different types of lathe. | L2 | 2M |
| (d) | Define the terms "Drilling". | L1 | 2M |
| (e) | Define the term Grinding. | L1 | 2M |

PART- B**(Answer all five units, 5 x 10 =50 Marks)****UNIT – I**

2. Distinguish the cutting process with neat sketches. L4 10M

OR

3. Explain the importance and functions of different tool angles associated with the geometry of a single point cutting tool with neat sketch. L3 10M

UNIT – II

4. Describe the factors affecting tool life and give Taylor's tool life equation. L2 10M

OR

5. Discuss tool failure and wear mechanism in cutting tool. L2 10M

UNIT – III

6. Discuss about the lathe attachments with neat sketches. L4 10M

OR

7. What are the differences between a Turret and a Capstan lathe? L2 10M

UNIT – IV

8. Draw the block diagram of a shaper machine and explain briefly its various parts and operations performed. L2 10M

OR

9. Draw the block diagram of a horizontal milling machine and explain its various parts. L2 10M

UNIT – V

10. With a neat sketch, explain construction and working of tool and cutter grinding machine. L2 10M

OR

11. How grinding machines are classified? Explain plain cylindrical grinding machine with neat sketch. L3 10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY, PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester (R18) Supplementary Examinations January 2022
DIGITAL COMMUNICATIONS
(ECE)

Time: 3 hours

Max.Marks: 60

PART - A

(Compulsory Questions)

Answer the following: (5 X 2 = 10 Marks)

- | | | | |
|----|----------------------------------|----|----|
| 1. | (a) Define Decoding. | L1 | 2M |
| | (b) Define ISI | L1 | 2M |
| | (c) Define analyzer. | L1 | 2M |
| | (d) Define BFSK. | L1 | 2M |
| | (e) What is Parity check matrix. | L1 | 2M |
-
- | | | | |
|--|--|----|-----|
| PART - B
(Answer all five units, 5 x 10 = 50 Marks) | | | |
| UNIT - I | | | |
| 2. | (a) Explain the DPCM system with neat diagram | L3 | 5M |
| | (b) What are the advantages & disadvantages of DPCM. | L1 | 5M |
| OR | | | |
| 3. | (a) With a neat block diagram explain PCM transmitter and receiver. | L3 | 5M |
| | (b) Explain the following line codes for 101001110 i) Unipolar RZ & NRZ ii) polar RZ & NRZ iii) Bipolar RZ & NRZ | L3 | 5M |
| UNIT - II | | | |
| 4. | What is correlative coding? Explain its types. | L3 | 10M |
| OR | | | |
| 5. | Explain duo-binary signaling scheme through one example. | L4 | 10M |
| UNIT - III | | | |
| 6. | (a) Draw the block diagram of a most basic form of digital communication system. | L4 | 5M |
| | (b) Illustrate optimum receiver for AWGN channel. | L3 | 5M |
| OR | | | |
| 7. | (a) Explain the concept of AWGN channel. | L5 | 5M |
| | (b) With a neat sketch explain the working of correlation receiver. | L2 | 5M |
| UNIT - IV | | | |
| 8. | (a) Compare all the digital modulation techniques. | L4 | 5M |
| | (b) Derive the probability of error for a coherent QPSK system. | L3 | 5M |
| OR | | | |
| 9. | (a) Derive an expression for probability of error of coherent binary ASK. | L2 | 5M |
| | (b) What is Bandwidth of BFSK, BPSK? | L4 | 5M |
| UNIT - V | | | |
| 10. | (a) Explain the concept of matrix representation of Linear block codes. | L3 | 5M |

- | | | | |
|-----|---|----|----|
| (b) | Write short notes on Error detection and correction codes. | L2 | 5M |
| 11. | (a) What are the types of parity check codes explain with neat diagrams | L1 | 5M |
| | (b) Explain the concept of Parity check matrix for linear block codes | L3 | 5M |

SIDDARTHATHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B-Tech III Year I Semester (R18) Supplementary Examinations January 2022
PYTHON PROGRAMMING
(CSE)

Time: 3 hours

Max.Marks: 60

PART-A**(Compulsory Questions)**

Answer the following: (5 X 2 = 10 Marks)

1. (a) How to take input from user in python? L1 2M
(b) List the arithmetic operators that python supports. L1 2M
(c) Define recursive function L1 2M
(d) Name the optional statements possible inside a try-except block in Python. L1 2M
(e) Compare Iterator and Iterable. L2 2M

PART- B

(Answer all five units, 5 x 10 =50 Marks)

UNIT - I

2. (a) Write history of Python. L3 5M
(b) List features and applications of Python. L1 5M

OR

3. (a) Explain variable assignment with suitable example. L2 5M
(b) What is data type? List out the data types with example. L1 5M

UNIT - II

4. (a) Explain Arithmetic operations (Addition, Subtraction, Multiplication, and Division) on integers. Input the two integer values and operator for performing arithmetic operation through keyboard L3 5M
(b) What are the different loop control statements available in Python? Explain with suitable examples. L2 5M

OR

5. (a) Write a Python program to find maximum among three numbers. L3 5M
(b) Describe Python jump statements with examples. L2 5M

UNIT - III

6. (a) Create recursive function to find factorial of a number L6 5M
(b) Illustrate lambda function with example. L4 5M

OR

7. (a) Define class and object with example code L1 5M
(b) Write about self-variable with code. L3 5M

UNIT - IV

8. (a) Describe about name spacing. L2 5M
(b) Explain about the import statement in modules. L2 5M

OR

9. (a) Explain about the from import statement in modules. L2 5M

L4 5M

L4 5M

L4 5M

L3 5M

L3 5M

(b) Illustrate about scoping.

UNIT - V

10. (a) Illustrate about Python Runtime Services.

(b) Illustrate about Command line arguments.

11. (a) Write about Dates and Times.

(b) Write about the writing files in python.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary Examinations January 2022
THERMAL ENGINEERING
(MECH)

Time: 3 hours

Max.Marks: 60

PART-A
(Compulsory Questions)

Answer the following: (5 X 2 = 10 Marks)

1. (a) How are heat engine classified
- (b) State how the air compressors are classified.
- (c) Name the meaning of Latent heat
- (d) Classify the various types of nozzles.
- (e) What are the methods of steam turbine governing?

PART- B

(Answer all five units, 5 x 10 =50 Marks)

UNIT - I

2. (a) Explain the working of 4-stroke Diesel engine.
- (b) Explain any six classifications of Internal Combustion engines.

OR

3. (a) Express the Working Principles of 2-Stroke Diesel Engine.
- (b) Give explanation about the Working Principle of 2-Stroke SI Engine.

UNIT - II

4. Construct an expression for minimum work for two stage reciprocating air compressors.

OR

5. Construct the relation for Volumetric efficiency of a single stage reciprocating compressor.

UNIT - III

6. A steam power plant operates on a theoretical reheat cycle. Steam at boiler at 550°C, 150 bar expands through the high pressure turbine. It is reheated at a constant pressure of 40 bar to 550°C and expands through the low pressure turbine to a condenser at 0.1 bar. Draw T-S and h-s diagrams. Find (i) Quality of steam at turbine exhaust (ii) Cycle Efficiency (iii) Steam rate in Kg/ Kw-hr.

OR

7. Describe the different operations of Rankine cycle and also derive the expression for its efficiency.

UNIT - IV

8. Steam initially dry and saturated is expanded in a nozzle from 15 bar at 300°C to 1.0 bar. If the frictional loss in the nozzle is 12% of the total heat drop calculate the mass of steam discharged when exit diameter of the nozzle is 15 mm.

OR

9. Explain about Surface condenser and discuss its types with neat sketches.

UNIT - V

10. A stage of a steam turbine is supplied with steam at a pressure of 50 bar and 350°C, and exhausts at a pressure of 5 bar. The isentropic efficiency of the stage is 0.82 and the steam consumption is 2270 kg/min. Determine the power output of the stage.

OR

11. The following data refer to a particular stage of a Parson's reaction turbine Speed of the turbine = 1500 r.p.m. Mean diameter of the rotor = 1 metre, Stage efficiency = 80 per cent, Blade outlet angle = 20°, Speed ratio = 0.7 Determine the available isentropic enthalpy drop in the stage.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary Examinations January 2022
Non-Conventional Energy Resources
(MECH)

Time: 3 hours

Max.Marks: 60

PART-A**(Compulsory Questions)**

1. Answer the following; (5 X 2 = 10 Marks)

- | | | |
|--|----|----|
| (a) Name the renewable energy sources | L1 | 2M |
| (b) Write the applications of solar energy | L1 | 2M |
| (c) What is wind power? | L1 | 2M |
| (d) Write the merits and demerits of Biomass Energy. | L1 | 2M |
| (e) List the different methods of hydrogen storage | L2 | 2M |

PART- B**(Answer all five units, 5 x 10 =50 Marks)****UNIT - I**

- | | | |
|--|----|----|
| 2. (a) Write short notes on solar radiation. | L1 | 5M |
| (b) Derive an Expression for solar radiation on tilted surfaces. | L3 | 5M |

OR

- | | | |
|---|----|----|
| 3. (a) What is the need of renewable energy. | L1 | 5M |
| (b) Describe Renewable Energy Scenario in Andhra Pradesh. | L2 | 5M |

UNIT - II

- | | | |
|--|----|-----|
| 4. Enumerate the different types of concentrating type collectors. | L3 | 10M |
|--|----|-----|

OR

- | | | |
|--|----|-----|
| 5. Explain the working of water heating system and desalination system with a neat sketch. | L2 | 10M |
|--|----|-----|

UNIT - III

- | | | |
|--|----|-----|
| 6. Describe with a neat sketch the working of wind energy system with main components. | L3 | 10M |
|--|----|-----|

OR

- | | | |
|--|----|-----|
| 7. How the electricity will be generated from wind turbine generator | L3 | 10M |
|--|----|-----|

UNIT - IV

- | | | |
|--|----|----|
| 8. (a) Write short notes on various methods of biomass analysis. | L1 | 5M |
| (b) Mention the characteristics of biodiesel. | L1 | 5M |

OR

- | | | |
|---|----|-----|
| 9. Explain the working of biomass Cogeneration system with a neat sketch and also mention its applications. | L2 | 10M |
|---|----|-----|

UNIT - V

- | | | |
|--|----|-----|
| 10. What is tide? Explain tidal energy and its conversion with neat diagram. | L1 | 10M |
|--|----|-----|

OR

- | | | |
|--|----|-----|
| 11. What are the geothermal power plants? Explain binary cycle power plant with neat diagram | L1 | 10M |
|--|----|-----|