SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations July-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) Find the rank of the matrix $A = \begin{bmatrix} 1 & 2 & 1 \\ -1 & 0 & 2 \\ 2 & 1 & -3 \end{bmatrix}$ L1   2 M

   (b) Define Gamma and Beta functions.   L1   2 M

   (c) Evaluate $\frac{du}{dt}$, where $u = x^2 y^3$ and $x = \log t$, $y = e^t$ L3   2 M

   (d) State D' Alembert's ratio test for convergence of a series   L2   2 M

   (e) If $f(x) = |\sin x|$ in $[-\pi, \pi]$, then find the Fourier constant a_0 L3   2 M

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

2. Verify the Cayley-Hamilton theorem for the matrix $A = \begin{bmatrix} 8 & -8 & 2 \\ 4 & -3 & -2 \\ 3 & -4 & 1 \end{bmatrix}$ L4   10M

OR

3. Find the Eigen values & Eigen vectors of the matrix $A = \begin{bmatrix} -2 & 2 & -3 \\ 2 & 1 & -6 \\ -1 & -2 & 0 \end{bmatrix}$ L3   10M

UNIT – II

4. Find the surface area of the sphere of radius 'a'.   L1   10M

OR

5. Verify Lagrange's mean value theorem for $f(x) = x^3 - x^2 - 5x + 3$ in the interval $[0, 4]$ L4   10M

UNIT – III

6. Examine the function $f(x, y) = x^4 + y^4 - 2x^2 + 4xy - 2y^2$, $x > 0, y > 0$ for extreme values.   L2   10M

OR

7. Find the angle between the surfaces $x^2 + y^2 + z^2 = 9$ and $z = x^2 + y^2 - 3$ at the point $(2, -1, 2)$ L3   10M

UNIT – IV

8. Test the convergence of the series $\sum \left\{ \frac{(n+1)^n x^n}{x^{n+1}} \right\}$ L2   10M

OR

9. Discuss the nature of the series (a). $\sum \left\{ \frac{1}{\sqrt{n}} \tan \frac{1}{n} \right\}$, (b). $\sum \left\{ \log \left(1 + \frac{1}{n} \right) \right\}$ L4   10M

UNIT – V

10. Expand $f(x) = (\pi - x)^2$ as a Fourier series in $0 \le x \le 2\pi$ L5   10M

OR

11. Expand $f(x) = x^2$ as Fourier half range sine series in $0 < x < 4$ L5   10M

Q.P. Code: 18HS0801   R18

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

1.   Answer the following; (5 X 2 = 10 Marks)
   (a) Write the Schrodinger wave equation.   L2   2M
   (b) Define entropy.   L1   2M
   (c) What is meant by break point chlorination?   L1   2M
   (d) What is substitution reaction? Give an example.   L2   2M
   (e) Write the selection rules of spectral analysis.   L1   2M

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

2. Write the silent features of crystal field theory. Explain the d-orbital's splitting   L2   10M
   in octahedral and tetrahedral complexes.

OR

3. (a) What is effective nuclear charge? Explain the variations of s, p, d and f orbital   L2   5M
       energies of atoms in periodic table.
   (b) Explain the molecular orbital theory with suitable diatomic molecule.   L2   5M

UNIT – II

4. Derive the Nernst equation. Apply the Nernst equation for an electro chemical   L3   10M
   cell.

OR

5. Define corrosion. Describe the factors affecting the corrosion rate.   L2   10M

UNIT - III

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

OR

7. (a) Write short note on sludge's and scales.   L2   5M
   (b) Define desalination of water. Explain the desalination of brackish water by   L2   5M
       reverse osmosis.

UNIT - IV

8. Explain the synthesis of paracetamol and penicillin.   L2   10M

OR

9. Write the preparation, properties and engineering applications of Bakelite.   L3   10M

UNIT - V

10. (a) Explain the principle and applications of UV-Vissible spectroscopy.   L3   5M
    (b) Explain the applications of fluorescence in medicine.   L3   5M

OR

11. Explain the principle and applications of infrared spectroscopy.   L3   10M

OR

8. A square pyramid of base 40 mm and axis 60 mm long, Its base lies on VP, with its axis parallel to HP. A cut sectional plane, 60 degree to VP and it pass 10mm away from the axis. Draw the projections sectional front view.   L2   12M

UNIT – V

9. Draw the isometric view of a cone of base diameter 50mm and axis 60 mm. The cone has its base on (a)HP (b)VP   L3   12M

OR

10. Draw the isometric view of a cylinder of base diameter 50mm and axis 60 mm the axis of the cylinder is perpendicular to the (a)HP (b)VP   L3   12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester (R18) Supplementary Examinations July-2022
ENGINEERING GRAPHICS & DESIGN
(MECH)

Time: 3 hours   Max.Marks: 60

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

UNIT – I

1. Construct an ellipse, with distance of the focus from the directrix as 50 mm and eccentricity as 2/3. Also draw normal and tangent to the curve at a point 40 mm from the directrix.   L3   12M

OR

2. Draw an ellipse(half ellipse by concentric circle method and half by rectangle method) having major axis is equal to 100 mm and the minor axis is equal to 70 mm.   L3   12M

UNIT – II

3. Draw the projections of the following points, keeping the distance between the projectors as 25mm on the same reference lines.   L3   12M
A - 20mm above HP and 30mm in front of VP
B - 20mm above HP and 30mm behind VP
C - 20mm below HP and 30mm behind VP
D - 20mm below HP and 30mm in front of VP
E - On HP and 30mm in front of VP
F - On VP and 20mm above HP
G - Lying on both HP and VP

OR

4. A point A is 20mm above the HP and 50mm in front of the VP. Another point B is 40mm below the HP and 15mm behind the VP. The distance between the projectors of the points, measured parallel to xy, is 75mm. Draw the projections of the points. Draw lines joining their FVs and TVs   L2   12M

UNIT – III

5. A regular hexagonal plane of 45 mm side has a corner on HP, and its surface is inclined at 450 to HP. Draw the projections, when the diagonal through the corner, which is on HP makes 300 with VP.   L2   12M

OR

6. A semi circular plane of diameter 70mm has its straight edge on the VP and inclined at 30 degree to the HP .draw the projection of the plane when its surface is inclined at 45 degree to VP.   L5   12M

UNIT – IV

7. A pentagonal pyramid with edge of base 25 mm and axis 65 mm long, its base is resting on HP. It is cut by a section plane, inclined at 60 degree to HP and perpendicular to VP at bisect the axis. Draw the projections and obtain the true shape of the section.   L3   12M

R19

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech I Year I Semester Supplementary Examinations July-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) Find the rank of the following matrix, by reducing into the echelon form   L1   6M

$$\begin{bmatrix} -1 & -3 & 3 & -1 \\ 1 & 1 & -1 & 0 \\ 2 & -5 & 2 & -3 \\ -1 & 1 & 0 & 1 \end{bmatrix}$$

   b) Show that the system $x + y + z = 6, x + 2y + 3z = 14, x + 4y + 7z = 30$ is consistent and solve them   L2   6M

OR

2. Verify Cayley – Hamilton theorem and hence find the A^{-1} and A^4 where   L2   12M

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

UNIT-II

3. Verify Roll's theorem for $f(x) = e^x(\sin x - \cos x)$ on $\left[\frac{\pi}{4}, \frac{5\pi}{4}\right]$ L2   12M

OR

4. a) Expand $\log(1 + e^x)$ is ascending powers of x   L2   6M

   b) Obtain the Taylor's series expansion of sin x in powers of $x - \frac{\pi}{4}$ L2   6M

UNIT-III

5. If $u = \frac{yz}{x}; v = \frac{zx}{y}; w = \frac{xy}{z}$, show that $\frac{\partial(u, v, w)}{\partial(x, y, z)} = 4$ L1   12M

OR

6. A rectangular box open at the top has a capacity of 32 cubic feet. Find the dimensions of the box requiring least material for its construction   L3   12M

UNIT-IV

7. a) Evaluate $\int_0^5 \int_0^{x^2} x(x^2 + y^2) \, dy \, dx$ L1   5M

   b) Evaluate $\int_0^1 \int_0^{\sqrt{1-x^2}} \int_0^{\sqrt{1-x^2-y^2}} xyz \, dz \, dy \, dx$ L1   7M

OR

8. Change the order of integration and evaluate $\int_0^{} \int_{\sqrt{}}^{\sqrt{}} y^2 \, dy \quad dx$ L2   12M

R19

UNIT-V

9. a) Evaluate i) $\int_0^\infty e^{-3x} x^6 dx$ ii) Evaluate $\int_0^\infty e^{-4x} x^{\frac{5}{2}} dx$ L2   6M

   b) Evaluate $\int_0^{\frac{\pi}{2}} \sqrt{\tan\theta} \, d\theta$ L2   6M

OR

10. a) Evaluate i) $\int_0^1 x^3(1 - x)^4 dx$ ii) $\int_0^1 x^{\frac{1}{2}}(1 - x)^{\frac{5}{2}} dx$ L2   6M

   b) Evaluate $\int_0^1 x^2(1 - x^3)^{10} dx$ L2   6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations July-2022
ADVANCED PHYSICS
(ME)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1. Derive the condition for bright and dark fringes through the interference in thin films by reflection?   L3   12M

OR

2. a) What is diffraction grating how diffraction grating constructed?   L3   8M
   b) Draw intensity distribution curves and give condition for bright and dark fringes in single slit diffraction pattern   L5   4M

UNIT-II

3. a) What is the importance of acoustics in engineering   L1   6M
   b) How we optimize the reverberation time in the music halls?   L1   6M

OR

4. a) Give the important applications of ultrasonic waves?   L3   6M
   b) How will you classify sound waves based on their frequencies?   L1   6M

UNIT-III

5. a) Define i) magnetic moment and ii) magnetic susceptibility   L3   4M
   b) Explain the origin of magnetic moments.   L2   8M

OR

6. a) What are dielectric materials? And explain their properties?   L1   7M
   b) Define i. dipole moment ii. Polarization   L3   5M

UNIT-IV

7. a) Describe the important characteristic of laser beam?   L2   6M
   b) Explain the difference between spontaneous and stimulated emission of radiation   L2   6M

OR

8. a) What is the acceptance angle of an optical fibre and derive an expression for it.   L1   6M
   b) What are the applications of fiber optics?   L1   6M

UNIT-V

9. a) What is Quantum Confinement?   L1   6M
   b) Write the applications of nanomaterial?   L2   6M

OR

10. a) Write brief note on biomedical applicatins of nanomaterials?   L2   6M
    b) What is the future scope of nanomaterials?   L1   6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations July-2022
APPLIED CHEMISTRY
(Common to EEE & ECE)

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.   L3   12M

OR

2. Define electrochemical sensor. Draw the neat sketch of electrochemical sensor and explain its construction, working principle and applications.   L3   12M

UNIT-II

3. Draw the molecular orbital diagrams of Oxygen molecule (O_2) and Nitrogen molecule (N_2). Explain their magnetic nature and bond order.   L5   12M

OR

4. a) Explain the application of Ψ and Ψ^2 to hydrogen atom.   L1   6M
   b) Write the postulates of molecular orbital theory.   L2   6M

UNIT-III

5. Explain the mechanism of Addition polymerization   L1   12M

OR

6. Write the preparation, properties and application of Buna-S rubber and Buna-N rubber   L3   12M

UNIT-IV

7. Define P^H ? Write principle and application of P^H metry   L3   12M

OR

8. Which methods are you using to separate from the Gaseous Mixtures?   L2   12M

UNIT-V

9. a) Write a note on Liquid Insulating Materials   L2   6M
   b) Write the Properties of Nanomaterials.   L2   6M

OR

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

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations July-2022
PYTHON PROGRAMMING
(Common to ECE & CSE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	Explain about the input and output statements or methods with example.	L2	12M

OR

| 2 | Explain briefly about the Multi-Valued Data types with example. | L2 | 12M |

UNIT-II

| 3 | a) | Write a Python program to print prime number series up to N. | L4 | 6M |
| | b) | Write a Python program to Swapping of two numbers with and without using temporary variable. | L4 | 6M |

OR

| 4 | Explain expressions in python with order of evaluation with example. | L2 | 12M |

UNIT-III

| 5 | a) | Write about class constructor(_init_()),self-variable | L4 | 5M |
| | b) | Compare method overloading and overriding | L3 | 7M |

OR

| 6 | What is inheritance? Illustrate types of inheritance with python code | L1, L2 | 12M |

UNIT-IV

| 7 | What is an Exception? Explain types of exceptions and give an example | L2 | 12M |

OR

| 8 | a) | Describe any one regular expression with an example? | L3 | 6M |
| | b) | Explain package installation via PIP | L2 | 6M |

UNIT-V

| 9 | a) | What is mean by Iterators and Generators? | L1 | 6M |
| | b) | Write about map and filter in Python? | L3 | 6M |

OR

| 10 | Explain about Mathematics function in python | L2 | 12M |

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR

(AUTONOMOUS)

B.Tech I Year I Semester Supplementary Examinations July-2022

ENGINEERING MECHANICS

(CE & ME)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1. State and prove **Varignon's** theorem.   L3   12M

OR

2.
a) State and prove **Lami's** theorem   L4   8M
b) Explain free body diagram with example.   L2   4M

UNIT-II

3. 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.   L4   12M

OR

4. A screw jack raises a load of 40 kN. The screw is square threaded having three threads per 20 mm length and 40 mm in diameter. Calculate the force required at the end of a lever 400 mm long measured from the axis of the screw, if the coefficient of friction between screw and nut is 0.12.   L4   12M

UNIT-III

5. A semicircle of 90 mm radius is cut out from a trapezium as shown in Fig. Find the position of the centre of gravity of the figure.   L4   12M
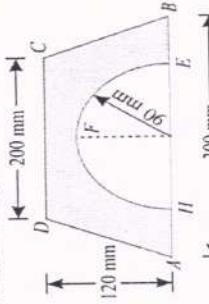

OR

6. Find the centre of gravity of a channel section 100 mm × 50 mm × 15 mm as shown in Fig   L1   12M

UNIT-IV
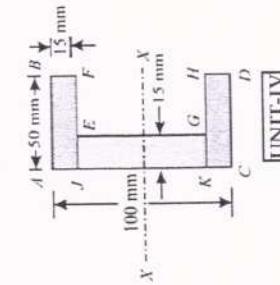
7. Prove the parallel axis theorem in the determination of moment of inertia of areas with the neat sketch.   L4   12M


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.   L1   12M

UNIT-V

9. An inclined truss loaded as shown in fig.   L1   12M

OR
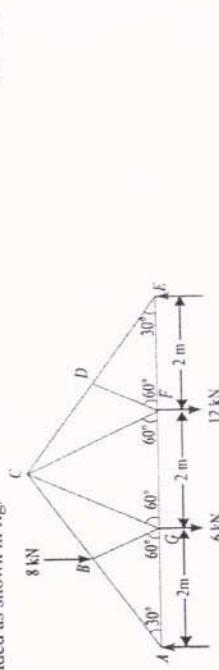
10. Explain the procedure to find forces in members of truss by using method of sections.   L2   12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech I Year I Semester Supplementary Examinations July 2022

ENGNEERING GRAPHICS

(Common to ECE & CSE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1. Draw an epi-cycloid of a circle of 40 mm diameter, which rolls on another circle of 120 mm diameter for one revolution clock wise. Draw a tangent and normal to it at a point 90 mm from the center of the directing circle.   L2   12M

OR

2. a) A thread of length 165 mm is wound round a circle of 40 mm diameter. Trace the path of end point of the thread   L3   6M

   b) Draw an involute of a triangle 20 mm side; draw a normal and a tangent at a point 60 mm from the centre of the triangle.   L2   6M

UNIT-II

3. 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

OR

4. A Thin 30°-60° set- square has its longest edge (diagonal) on H.P and inclined at 30° to V.P. Its surface makes an angle of 45° with H.P. Draw the projections, choosing suitable size for the set -square.   L4   12M

UNIT-III

5. Draw the projections of a hexagonal prism of side of base 25 mm and axis 60 mm long, when it is resting on one of its corners of the base on H.P. The axis of the solid is inclined at 45° to H.P.   L4   12M

OR

6. A cone with base 60 mm diameter and axis 75 mm long is resting on its base on H.P. It is cut by a section plane parallel to H.P and passing through the mid-point of the axis. Draw the projections of the cut solid   L3   12M

UNIT-IV

7. A pentagonal pyramid of side of base 30 mm and 60 mm long, is resting on its base on H.P, with an edge of the base parallel to V.P. draw the development of the lateral surface of the pyramid   L3   12M

OR

8. A cylinder 50mm diameter and 70mm axis is completely penetrated by a square prism of side 25mm and axis 70 mm horizontally. Both the axis intersects and bisects each other. All faces of the prism are equally inclined to HP. Draw the projections showing the curves of intersection.   L4   12M

UNIT-V

9. Draw three views of the blocks shown pictorially in figure according to first angle projection.   L3   12M

OR
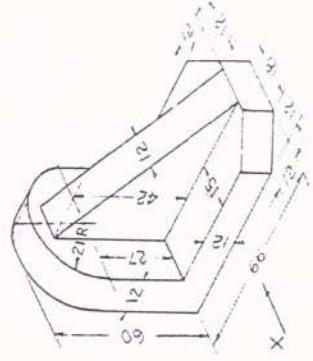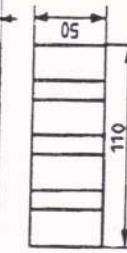
10. Draw the isometric view of the following sketch.   L4   12M

Q.P. Code: 18HS0803

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations July-2022
BIOLOGY FOR ENGINEERS
(ECE)

Max.Marks: 60

Time: 3 hours

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

1. (a)	What are the three domines(kingdoms) of life?	L2	2 M
(b)	What is cell cycle?	L2	2 M
(c)	Write any four functions of proteins	L4	2 M
(d)	Write full form of M-RNA& TRNA & their functions	L4	2 M
(e)	Define stem cells & their functions	L3	2 M

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

2. What are Model organisms? Give brief notes n any three model organisms. L2 10 M
OR
3. Draw labeled diagram of Animal cell as seen in Electron microscope. L5 10 M
Comment on characteristics of Animal cell.

UNIT – II

4. Explain Meiosis with diagrammatic representation . L2 10 M
OR
5. Define Genetics and explain Dihybride cross. L3 10 M

UNIT – III

6. Biological classification of amino acids and their importance. L4 10 M

OR

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

UNIT – IV

8. Explain & Describe the R-DNA technology methods L2 10 M
OR
9. What are the functions & Structure of Proteins? L2 10 M

UNIT – V

10. Explain identification and classification of microorganisms. L2 10 M
OR
11. Define exothermic and endothermic reactions. L3 10 M

Q.P. Code: 18CS0504

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester (R18) Supplementary Examinations July-2022
DATA STRUCUTURES & ALGORITHMS
(CSE)

Max.Marks: 60

Time: 3 hours

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

1.
(a)	State the difference between stacks and linked lists?	L2	2M
(b)	Write the postfix and prefix notations for the following expression: A/B*C-D*E+F/G	L1	2M
(c)	State the properties of a Binary Tree?	L1	2M
(d)	Define BFS with an example.	L1	2M
(e)	Define sorting and its types?	L1	2M

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

2. What is a double linked list? Name the three fields of double linked list?   L2   10M

OR

3. Explain how to create circular linked list and insert nodes at end   L4   10M

UNIT – II

4. What is a queue? What are various operations that can be performed on them? Explain with an example   L2   10M

OR

5. Write a program to perform basic operations on stack   L2   10M

UNIT – III

6. Explain the various operations on a Binary tree with an example?   L2   10M

OR

7. Construct a binary search tree from the given values. Consider the first value as the root value. Values: 45, 23, 29, 85, 92, 7, 11, 35, 49, 51   L3   10M

UNIT – IV

8. Write and explain Dijkstra algorithm for finding shortest path. Give an example   L2   10M

OR

9. a) Compare binary search and linear search techniques.   L3   5M
   b) Find the number 77 from the following set of numbers using binary search: 6, 12, 17, 23, 38, 45, 77, 84, 90.   L4   5M

UNIT – V

10. Explain about bubble sort with algorithm   L2   10M

OR

11. State and explain algorithm to perform Heap sort? Sort the following numbers using heap sort: 47, 32, 15, 38, 55, 17, 25, 45, 42 and 50.   L3   10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations July-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 3/8th rule of numerical integration.   L2   2 M
   (b) Define the diagonal five-point formula.   L1   2 M
   (c) Evaluate the Laplace transform of $f(t) = 3\cos 3t . \cos 4t$ L4   2 M
   (d) Define the inverse Fourier sine and inverse Fourier cosine transforms   L1   2 M
   (e) Solve the partial differential equation $r + 6s + 9t = 0$ L3   2 M

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

UNIT – I

2. Predict a real root of the equation $xe^x - \cos x = 0$ using Newton-Raphson method   L2   10 M

OR

3. Predict $f(32)$ by using Newton's backward interpolation from the values $f(25) =$ L2   10 M
   0.2707, $f(30) = 0.302$, $f(35) = 0.3386$, $f(40) = 0.3794$

UNIT – II

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

OR

5. Estimate the values of $u(x,y)$ from the Laplace equation $\nabla^2 u = 0$ at the pivotal   L5   10 M
   points with boundary conditions $u(0,y) = 0$, $u(4,y) = 12 + y$ for $0 \le y \le 4$ and
   $u(x,0) = 3x$, $u(x,4) = x^2$ for $0 \le x \le 4$ by taking $h = 1, k = 1$.

UNIT – III

6. Evaluate (a). $L^{-1}\left\{\frac{3s-2}{s^2-4s+20}\right\}$, (b). $L^{-1}\left\{\frac{1}{2}\log\left(\frac{s^2+a^2}{s^2+b^2}\right)\right\}$ L4   10 M

OR

7. Solve the differential equation $x''(t) + 9x(t) = \sin t$, $x(0) = 1$, $x\left(\frac{\pi}{2}\right) = 1$ using   L4   10 M
   Laplace transform technique.

UNIT – IV

8. Find the Fourier sine and cosine transforms of $f(x) = \frac{e^{-ax}}{x}$ L1   10 M

OR

9. Find the Fourier transform of $f(x) = e^{-(x^2/2)}$, $-\infty < x < \infty$ L1   10 M

UNIT – V

10. Solve the partial differential equation $x^2(y - z)p + y^2(z - x)q = z^2(x - y)$ L3   10 M

OR

11. A homogeneous rod of conducting material of length $100\ cm$ has its ends kept at 0   L3   10 M
    temperature and the temperature initially is $u(x,0) = \begin{cases} x, & 0 \le x \le 50 \\ 100 - x, & 50 \le x \le 100 \end{cases}$. Find
    the temperature $u(x,t)$ at any time.

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

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

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

(a)	Draw the star connected load	L1	2M
(b)	Define natural response.	L2	2M
(c)	Define twigs.	L2	2M
(d)	What are the units of h11 and h21.	L1	2M
(e)	Define unstable system.	L2	2M

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

2. Derive the relationship between Phase and Line voltages, currents in delta connected load   L5   10M

OR

3. The two wattmeter method is used to measure power in a three phase load. The wattmeter readings are 400W and -35W.calculate(i) total active power (ii) reactive power (iii) power factor   L3   10M

UNIT – II

4. Derive the transient response of an RC circuit with dc excitation.   L5   10M

OR

5. Derive the transient response of an RC circuit with AC excitation   L5   10M

UNIT – III

6. In the network graph shown in figure, determine cut set matrix and write the relation between node voltages and branch voltages. Choose 4, 5 & 6 are twigs.   L1   10M

OR
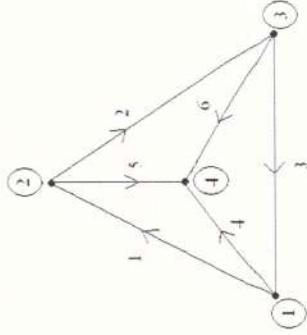
7. Determine i_x for the following network.   L6   10M
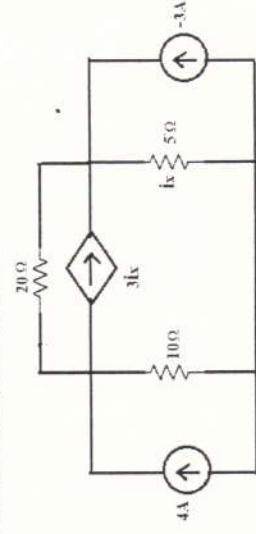
UNIT – IV

8. Derive the expressions for Y-parameters in terms of ABCD parameters?   L3   10M

OR

9. The given A,B,C&D parameters are A=20,B=14,C=25,D=12 respectively find i)Y-parameters ii)Z- parameters   L3   10M

UNIT – V

10. A 500Ω resistor, a 16Mh inductor, and a 25 nF capacitor are connected in parallel which is placed in series with a 2000Ω resistor. Express the impedance of this series combination as a rational function of s.   L3   10M

OR

11. Find the signal y(t), the Laplace transform of signal which is $Y(S) = \frac{s^3+7s^2+18s+20}{s^2+5s+6}$ L3   10M

Q.P. Code: 18IS0835

R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech. II Year I Semester Supplementary Examinations July-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) Given $P(A)=\frac{1}{4}$, $P(B)=\frac{1}{3}$ and $P(A \cup B)=\frac{1}{2}$, then evaluate $P(A|B')$. L2 2M

(b) Let X be the number of typo errors made by the data entry operator on typing one page of content, have a Poisson distribution with mean 5. Find $P[X>3]$. L1 2M

(c) Let the mean = 35, the second and third moments about mean are $\mu_2 = 260$ and $\mu_3 = 480$ respectively for a distribution. Then find the values of standard deviation and moment measure of skewness. L3 2M

(d) A sample of 1000 days is taken from meteorological records of certain district and 120 of them are found to be foggy. What are the probable limits to the percentage of foggy days in the district? L1 2M

(e) Compute the standard error with the following information:
$n_1=64, \bar{x}_1=67.5, \sigma_1=2.6$ and $n_2=60, \bar{x}_2=68.5, \sigma_2=2.4$ L2 2M

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:	-2	-1	0	1	2	3
P(x):	0.1	k	0.2	2k	0.3	k

(i) Determine the value of k. (ii) Find $P[-1<X<3]$ and (iii) Compute the expectation of $2X+1$. L1 5M

(b) On a laboratory assignment, if the equipment is working, the density function of the observed outcome, X, is
$f(x)=\begin{cases} 2(1-x), & 0<x<1 \\ 0, & otherwise \end{cases}$
(i) What is the probability that X will exceed 0.5?
(ii) Given that $X \geq 0.5$, what is the probability that X will be less than 0.75? L2 5M

OR

3.
(a) In a certain assembly plant, three machines, B1, B2, and B3, make 30%, 45%, and 25%, respectively, of the products. It is known from past experience that 2%, 3%, and 2% of the products made by each machine, respectively, are defective. Now, suppose that a finished product is randomly selected. What is the probability that it is defective? L1 5M

(b) A continuous random variable X has the density function: $f(x)=\begin{cases} \dfrac{x+1}{2}, & -1<x<1 \\ 0, & otherwise \end{cases}$. Find (i) E[X] and (ii) Variance of X. L2 5M

UNIT - II

4.
(a) The probability that a certain type of vacuum tube will shatter during a thermal shock test is 0.25. What is the probability that if 15 of such tubes are tested (i) 4 or more will shatter? (ii) Between 6 and 10 will shatter? L3 5M

(b) On average, 3 traffic accidents per month occur at a certain intersection. What is the probability that in any given month (i) exactly 5 accidents will occur? (ii) at least 3 accidents will occur? L3 5M

Q.P. Code: 18IS0835

5. Let X be a normal variate with mean 30 and standard deviation 5, find the probabilities that
(i) $26 \leq X \leq 40$ (ii) $X \geq 45$ (iii) $|X-30|>5$ L2 10M

OR

UNIT - III

6.
(a) The following data shows the daily expenditure of the families:

Daily expenditure (Rs. '00)	0-20	20-40	40-60	60-80	80-100
No. of families	13	25	27	19	16

Find the mean and first quartile. L3 5M

(b) The amounts of a chemical compound y that dissolved in 100 grams of water at various temperatures (x) were recorded as follows:

x(°C)	0	15	30	45	60	75
y	8	12	25	31	44	48

Find the equation of the regression line. Hence, estimate the amount of chemical that will dissolve in 100 grams of water at 50°C. L3 5M

OR

7.
(a) Compute and interpret the correlation coefficient for the following grades of 6 students selected at random:

Maths grade (x)	7.0	9.2	8.0	7.4	6.5	8.3
English grade (y)	7.4	8.4	6.3	8.7	7.8	9.0

L3 5M

(b) The following information represents the monthly income of workers employed by a company. L2 5M

Monthly income (in Rs. 000's)	20-25	25-30	30-35	35-40	40-45
Number of workers	8	12	15	20	12

Find the minimum income earned by the top 25% of workers.

UNIT - IV

8.
(a) The velocity V of a liquid is known to vary with temperature according to a quadratic fit $V = a + bT + cT^2$. Find the best possible values of a, b and c for the following tabulated data: L3 5M

T	1	2	3	4	5	6
V	2.3	2.0	3.8	1.7	1.5	1.4

(b) A researcher claims that Republican Party will win in next Senate elections especially in Florida State. A statistical data reported that 23% voted for Republican Party in last election. To test the claim a you surveyed 80 people and found 22 said they voted for Republican Party in last election. Is there enough evidence at $\alpha=0.05$ to support this claim? L1 5M

OR

9. In a city A 20% of a random sample of 900 school boys had a certain slight physical defect. In another city B, 18.5% of a random sample of 1600 school boys had the same defect. Is the difference between the proportions significant at a significance level of (i) 0.05 (ii) 0.01? L3 10M

UNIT - V

10. Two machines A and B were tested according to the time in seconds to run a particular experiment with the following results: L1 10M

A	28	30	32	33	33	29	34
B	29	30	30	24	27	29	-

Test whether you can discriminate the two machines at 5% significance level.

OR

11. For the data in the following table, test for independence between the students ability in Mathematics and interest in Bio-Statistics, at 5% level of significance. L3 10M

Interest in Bio-Statistics	Ability in Mathematics		
	Low	Average	High
Low	63	42	15
Average	58	61	31
High	14	47	29

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations July-2022
ELECTRONIC DEVICES
(ECE)

Time: 3 hours   Max.Marks: 60

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

1.
(a) Draw the circuit of PN Junction Diode for Forward Bias, and brief out   L2   2M
(b) Explain how PN Junction diode acts as a Rectifier?   L1   2M
(c) What is biasing and need for biasing   L3   2M
(d) Draw the circuit diagram of single stage RC coupled amplifier and explain the   L5   2M
component coupling capacitor (CC)
(e) Classify Field effect transistor   L4   2M

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

2. Explain the operation of a Silicon P-N Junction diode and obtain the forward   L4   10M
and reverse bias V-I Characteristics?

OR

3. (a) For the circuit shown below, determine VD, VR and ID.   L5   5M
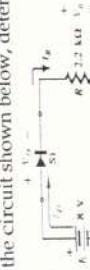
(b) Explain in detail about the current components in a p-n junction diode   L4   5M

UNIT – II

4. Draw the circuit diagram of half-wave rectifier with inductor filter and describe   L2   10M
it.

OR

5. Develop the expression for a ripple factor in a full-wave rectifier with resistive   L6   10M
load in detail

UNIT – III

6. Explain input and output characteristics of a transistor in CB configuration,   L4   10M
with neat diagram.

OR

7. (a) Calculate the collector current and emitter current for a transistor with –α$_{dc}$ L3   5M
=0.99 and I$_{CBO}$ =50μA when the base current is 20 μA
(b) Determine the stability factor for a CB amplifier circuit   L2   5M

UNIT - IV

8. Draw the circuit diagram of h-parameter model of CE amplifier and derive   L2   10M
expressions for the current gain, voltage gain, input resistance and output
resistance?

OR

9. Explain the working of a single stage RC couple amplifier with a diagram   L2   10M

UNIT - V

10. (a) Derive the expressions for Z i, Zo and Av for common drain J-FET amplifier.   L6   5M
(b) Explain the four distinct regions of the output characteristics of JFET   L4   5M

OR

11. Explain drain-source characteristics and transfer characteristics of JFET.   L4   10M

Q.P. Code: 18EC0443

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations July-2022
ANALOG ELECTRONIC CIRCUITS
(Common to EEE & CSE)

Max.Marks: 60

Time: 3 hours

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

1.
   (a) Draw the circuit symbol of a Zener diode and explain its working.   L2   2M
   (b) Explain the operation of PNP transistor and state why PNP is not wildly used.   L1   2M
   (c) Classify Field Effect Transistor.   L3   2M
   (d) Draw the circuit diagram of inverting amplifier and name its parts.   L2   2M
   (e) List out the important features of an instrumentation amplifier.   L3   2M

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

UNIT – I

2. Draw and explain the circuit of Full-Wave –rectifier.   L5   10M

OR

3. (a) Compare the V-I characteristics of PN-Junction diode and Zener Diode.   L5   5M
   (b) Derive an expression for root mean square current.   5M

UNIT – II

4. Recall the working and construction of NPN transistor.   L1   10M

OR

5. How a Transistor works as a switch, explain with a diagram.   L1   10M

UNIT - III

6. Classify Field Effect Transistor.   L4   10M

OR

7. (a) Explain the working and construction of JFET.   L5   5M
   (b) Compare BJT and FET.   L4   5M

UNIT - IV

8. Contrast the Operational Amplifier Internal Circuit.   L4   10M

OR

9. Draw the circuit of Voltage Follower and explain   L3   10M

UNIT - V

10. (a) Derive high pass active filter.   L3   5M
    (b) Explain R-2R Ladder DAC.   L5   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 July-2022
DIGITAL SYSTEM DESIGN
(ECE)

Time: 3 hours   Max.Marks: 60

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

1.		
	(a)	Define the hexadecimal numbers	2M
	(b)	Describe the SOP & POS form	2M
	(c)	Explain Canonical and Standard Forms.	2M
	(d)	Define and prove the De-Multiplexers	2M
	(e)	Explain the principle of Concept of Programmable logic devices	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 hexadecimal numbers   10M

OR

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

UNIT – II

4. Give the octal equivalent of hexadecimal numbers of DC.BA and AB.CD   10M

OR

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

UNIT - III

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

OR

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

UNIT - IV

8. List out the CMOS families applications and design with suitable examples   10M

OR

9. Explain the PLA Logic implementation using Programmable Devices.   10M

UNIT - V

10. (a) Draw the diagrams of Data types and objects, Dataflow.   5M
    (b) Draw the neat diagrams of the FSM & HDL   5M

OR

11. Define the Different modelling styles in VHDL   10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester (R18) Supplementary Examinations July/August-2022
ELECTROMAGNETIC FIELDS
(EEE)

Max.Marks: 60

Time: 3 hours

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

1.
(a)	Write about cross product and dot product?	L2	2M
(b)	Write Maxwell's first equation in integral and point form?	L1	2M
(c)	Define Dielectric Strength?	L1	2M
(d)	State Ampere's circuital law?	L3	2M
(e)	Write Maxwell equations in time varying fields?	L2	2M

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

UNIT – I

2. The vector from the origin to point A is given as (6,-2,-4), and the unit vector directed from the origin toward point B is (2, -2, 1)/3. If points A and B are ten units apart, find the Coordinates of point B   L2   10M

OR

3. Express in cylindrical components; (a) the vector from C(3,2,-7) to D(-1,-4,2); (b) a unit vector at D directed toward C; (c) a unit vector at D directed toward the origin   L4   10M

UNIT – II

4. Four positive point charges 10-12 coulomb each are situated in X-Y plane at points (0, 0), (0, 1) (1, 1) and (1, 0) m. Find the electric field and potential at (3/4, 3/4) and (1, 1).   L2   10M

OR

5. Find an expression for electrical field intensity due to infinite line charge?   L2   10M

UNIT – III

6. Explain the phenomenon of polarization when a dielectric slab is subjected to an electric field?   L2   10M

OR

7. At the boundary between glass ε_r=4 and air, the lines of electric field make an angle of 40⁰ with normal to the boundary. If electric flux density in the air is 0.25μC/m³. Determine the orientation and magnitude of electric flux density in the glass?   L3   10M

UNIT – IV

8. Find the magnetic field intensity $\bar{H}$ due to co-axial cable?   L2   10M

OR

9. a) Explain relationship between magnetic torque and moment?   L2   5M
   b) Derive an expression for the force between two current carrying wires?   L4   5M

UNIT – V

10. Explain faradays law of electromagnetic induction and there from derive maxwell's equation in differential and integral form?   L2   10M

OR

11. What is displacement current? Explain physical significance of displacement current?   L1   10M

Q.P. Code: 18CE0151

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year I Semester (R18) Supplementary Examinations July/August-2022

STRENGTH OF MATERIALS

(MECH)

Time: 3 hours   Max.Marks: 60

PART-A

(Compulsory Questions)

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

1.	(a)	Define elasticity and plasticity	L1 2M
	(b)	Write the classification of beams.	L2 2M
	(c)	What are the assumptions made in theory of simple bending;	L2 2M
	(d)	Define polar modulus.	L1 2M
	(e)	What is thin walled pressure vessel.	L1 2M

PART- B

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

UNIT – I

2. A steel rod of 3 cm diameter is enclosed centrally in a hollow copper tube of external diameter 5cm and internal diameter of 4cm. the composite bar is then subjected to an axial pull of 45000N,if the length of each bar is equal to 15 cm, determine: i) The stresses in the rod and tube, and (ii) Load carried by each bar.   L3   10M

OR

3. Determine the changes in length, breadth and thickness of a steel bar which is 4 m long, 30 mm wide and 20 mm thick and is subjected to axial pull of 30 KN in the direction of its length. Take E=2x105N/mm² and µ=0.3   L3   10M

UNIT – II

4. A cantilever of length 3 m carries a uniformly distributed load of 2.5 KN/m length over the whole length and a point of 3.5 KN at the free end. Draw SFD and BMD for the cantilever.   L4   10M

OR

5. A cantilever of length 3 m carries a uniformly distributed load of 1.5 KN/m run over a length of 2 m from the free end.   Draw SFD and BMD for the beam.   L4   10M

UNIT – III

6. A beam is simply supported and carries a uniformly distributed load of 40KN/m run over the whole span. The section of the beam is rectangular having depth as 500mm. If the maximum stress in the material of the beam is 120 N/mm² and moment of inertia of the section is 7 x 108mm4, find the span of the beam.   L5   10M

OR

7. Derive the bending equation   L4   10M

UNIT – IV

8. Derive the relation between slope, deflection and radius of curvature.   L4   10M

OR

9. A beam of length 8 m is simply supported at its ends and carries two-point loads of 36 KN and 46 KN at a distance of 1.5 m and 4 m from the left support. Find: (i) deflection under each load. (ii) Maximum deflection and (iii) The point at which maximum deflection occurs, given E = 2 x 105 N/mm2 and I = 85 x 106 mm4. Use Macaulay's method?   L3   10M

Q.P. Code: 18CE0151

UNIT – V

10. A steel tube of 200 mm external diameter is to be shrunk on to another steel tube of 60 mm internal diameter. After shrinking the diameter at the junction is 120 mm. Before shrinking on the difference of diameter at the junction is 0.08 mm. Find the hoop stresses developed in the two tubes after shrinking on and the radial pressure at the junction. Take E= 2x 105 N/mm².   L3   10M

OR

11. Derive the expression for stresses developed in a compound thick cylinder (Lame's theorem).   L4   10M

Q.P. Code: 18EC0403

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations July/August 2022
SIGNALS & SYSTEMS
(ECE)

Max.Marks: 60

Time: 3 hours

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

1.

(a)	Define unit ramp function	L1	2M
(b)	State duality property of FT	L1	2M
(c)	Define stability	L1	2M
(d)	Write the properties of ESD and PSD	L1	2M
(e)	State and prove differentiation property of Z-transform	L1	2M

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

2. Explain the classification of signals in detail   L2   10M

OR

3. Check whether the systems are time invariant or not   L3   10M
   a) $y(t) = x(-2t)$ b) $y(t) = e^{2x(t)}$ c) $y(n) = x(n) + nx(n-2)$
   d) $y(n) = x^2(n-2)$ e) $y(n) = sin[x(n)]$

UNIT – II

4. What is meant by Fourier Series? Explain the conditions under which any periodic waveform can be expressed using Fourier series.   L2   10M

OR

5. By using partial fraction method, find the inverse Fourier transform of the following a) $X(\omega) = (4(j\omega)+6)/((j\omega)^2+6(j\omega)+8)$ b) $X(\omega) = (1+3(j\omega))/(j\omega+3)^2$ c) $X(\omega) = (j\omega)/(3+j\omega)^2$ L3   10M

UNIT - III

6. A signal $(t) = 2\cos 400\pi t + 6\cos 640\pi t$ is ideally sampled at $f_s = 500$ Hz . If the sampled signal is passed through an ideal LPF with a cut off frequency of 400Hz, what frequency components will appear in the output? Find the output signal.   L3   10M

OR

7. (a) The impulse response of a continuous time system is expressed as $h(t) = (1/RC)e^{-t/RC}u(t)$ Find the Magnitude and frequency response of the system.   L3   5M
   (b) The impulse response of a continuous time system is expressed as $h(t) = e^{-2t}u(t)$ Find the Magnitude and frequency response of the system.   L3   5M

UNIT - IV

8. Explain the concept of Convolution and list the properties of Convolution in detail   L1   10M

OR

9. Explain the auto correlation and their properties in energy signals and power signals.   L2   10M

UNIT - V

10. (a) What is meant by ROC? List the properties of ROC in Laplace transform.   L2   5M
    (b) List the Advantages and limitation of Laplace transform   L2   5M

OR

11. Using the convolution theorem of Laplace transform find $y(t)$ L3   10M
    a) $x_1(t) = e^{-2t}u(t)$; $x_2(t) = u(t-3)$ b) $x_1(t) = tu(t)$; $x_2(t) = tu(t)$
    c) $x_1(t) = \cos 4t\, u(t)$; $x_2(t) = \sin 2t\, u(t)$
    d) $x_1(t) = e^{-2t}u(t)$; $x_2(t) = e^{-4t}u(t)$ e) $x_1(t) = e^{-t}u(t)$; $x_2(t) = e^{-3t}u(t)$

Q.P. Code: 18EE0204

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester (R18) Supplementary Examinations July/August - 2022

ELECTRICAL MACHINES-I
(EEE)

Max.Marks: 60

Time: 3 hours

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

1.
(a) Write the purpose of the commutator?   L1   2M
(b) Write the working principle of a DC motor.   L1   2M
(c) Name the methods of direct and indirect testing?   L2   2M
(d) Define a transformer?   L1   2M
(e) Full load copper loss in a transformer is 1600 watts. What will be the copper loss at half full load and 3/4th full load?   L4   2M

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

UNIT – I

2. What are the various characteristics of compound generators?   L1   10M

OR

3. Draw and explain the characteristics of DC series and DC Shunt Generators.   L4   10M

UNIT – II

4. Explain the principle of operation of a D.C motor. Derive the equation for the torque Developed by a D.C. motor?   L3   10M

OR

5. Explain in detail about the types of D.C motors. Also mention their applications?   L3   10M

UNIT – III

6. Describe Retardation test n detail. What are its advantages and disadvantages?   L2   10M

OR

7. Explain in detail about the parallel operation of DC series generators   L3   10M

UNIT – IV

8.
(a) Describe the Parallel operation of transformers with equal voltage ratios.   L2   5M
(b) Draw the equivalent circuit of an Auto transformer.   L4   5M

OR

9.
(a) Discuss the constructional features of transformers. Draw neat diagrams.   L2   5M
(b) A 10KVA, 2200/400V transformer has R1=5 Ω, X1=12 Ω, R2=0.2 Ω and X2=0.48 Ω. Determine the equivalent impedance of the transformer referred to (i) primary side (ii) secondary side.   L4   5M

UNIT – V

10. Discuss how you will perform O.C and S.C tests on a single phase transformer in the Laboratory.   L2   10M

OR

11. . Explain about principle of operation of single phase induction motor.   L3   10M

Q.P. Code: 18CS0506

R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester (R18) Supplementary Examinations July-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) What is a data model? List the types of data model used   L1   2M
   (b) Define Primary key and Candidate key   L2   2M
   (c) Explain the classification of functional dependency   L1   2M
   (d) Define transaction management   L1   2M
   (e) Give one example for linear hashing   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. List the database models and explain Architecture of database?   L3   10M

UNIT – II

4. What is a join operator? Explain about conditional join and natural join with syntax and example.   L3   10M
   OR
5. How to list and update row in a table? Explain with syntax and examples   L2   10M

UNIT – III

6. a) Differentiate BCNF with 3rd normal form.   L4   5M
   b) Explain about denormalization   L3   5M
   OR
7. Explain about schema refinement in database design.   L3   10M

UNIT – IV

8. Explain ACID properties of transaction management   L3   10M
   OR
9. Explain buffer management in concurrency control system   L3   10M

UNIT – V

10. Compare file organizations   L5   10M
    OR
11. Explain about B+ Trees?   L3   10M

R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations July-2022
NETWORK THEORY
(ECE)

Time: 3 hours   Max.Marks: 60

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

1.	(a)	Define Super node and Super mesh.	L2 2M
	(b)	Draw the block diagram of band-pass and band-elimination filters.	L4 2M
	(c)	What area the initial conditions? Explain briefly.	L1 2M
	(d)	Draw the equivalent circuit of Z-parameters	L4 2M
	(e)	Write any two properties of Fourier transforms.	L2 2M

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

2.	(a)	Explain about Nodal analysis and write the steps for applying nodal analysis.	L3 5M
	(b)	Determine the mesh currents for the following network.	L5 5M
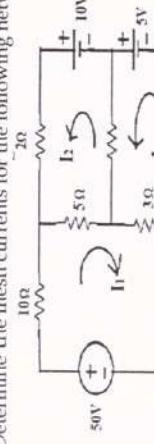
OR

3.	(a)	State and prove Milliman''s theorem	L2 5M
	(b)	Verify reciprocity theorem for the network shown in below figure.	L4 5M
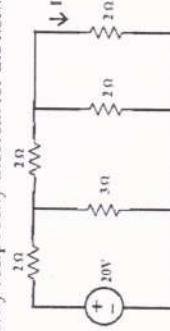
UNIT – II

4.	(a)	Explain about Quality factor and Band-width of Series resonance.	L3 5M
	(b)	Design constant-K band pass filter having a design impedance of 500Ω and cut-off frequencies f$_1$= 1kHz and f$_2$= 10 kHz	L5 5M

OR

5.		Explain about Constant-K high-pass filter in detail.	L3 10M

R18

UNIT – III

6.		Derive the Transient Response of series RLC-circuit with D.C excitation.	L4 10M

OR

7.		Derive the Transient Response of Series RC circuit with A.C excitation.	L4 10M

UNIT - IV

8.	a)	Explain about h-parameters in terms of y-parameters.	L3 5M
	b)	Find the Short-circuit parameters for the circuit shown in figure.	L4 5M
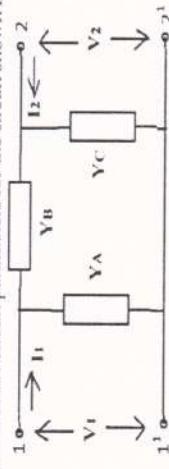
OR

9.	a)	The given ABCD parameters are, A=2, B=0.9, C=1.2, D= 0.5. Find Y-parameters.	L2 5M
	b)	The given Y-parameters are, Y11= 0.5, Y12= Y21= 0.6, Y22= 0.9.Find Impedance parameters.	L2 5M

UNIT - V

10.		Write and prove the properties of Fourier transforms	L2 10M

OR

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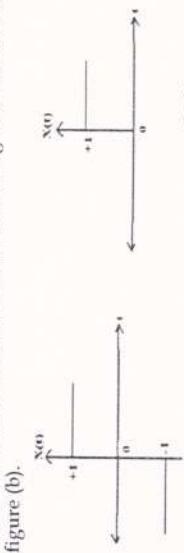
fig(a)

fig(b)

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations July 2022
PROBABILITY, NUEMERICAL 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 3men and 2 women. Three persons are selected at random from this group. Apply the probability that one man and two women are selected. — L1 6M

   (b) Two cards are selected at random from 10 cards numbered 1 to 10. Find the probability that the sum is even if (i) The two cards are drawn together. (ii) The two cards drawn one after other with replacement. — L1 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. Find a positive root of $f(x)=e^x$ -3 correct to two decimal places by Bisection method. — L1 12M

OR

4. Using Newton–Raphson method (i) Find square root of 28 (ii) Find cube root of 15 — L3 12M

UNIT-III

5. Using Taylor's series method find an approximate value of y at x = 0.2 for the D.E y^1- 2y = 3e^x, y(0) = 0. Compare the numerical solution obtained with exact solution. — L3 12M

OR

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

UNIT-IV

7. Applying, Laplace transform method to solve $y''-3y'+2y=4t+e^{3t}$, $y(0)=1, y^1(0)=1$ — L3 12M

OR

8. (a) Find the Laplace transform of $f(t)=t^2e^{2t}\sin 3t$ — L1 6M

   (b) Find the Laplace transform of $f(t)=\dfrac{1-\cos at}{t}$ — L3 6M

UNIT-V

9. Determine the value of Z(cosnt) and Z(sinnt). Hence find (i) Z(n cosnt) (ii) Z(n sinnt) — L5 12M

OR

10. Applying the Z –transform, solve $y_{n+2}-6y_{n+1}+8y_n=2^n+6n$ — L3 12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations July 2022
NUMERICAL METHODS & TRANSFORMS
(ECE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1 Using bisection method, find the negative root of the equation $x^3 - 4x + 9 = 0$ correct up to 4 decimal places.   L2   12M

OR

2 The table gives the distances in nautical miles of the visible horizon for the given heights in feet above the earth's surface: L3   12M

x = Height	100	150	200	250	300	350	400
y = Distance:	10.63	13.03	15.04	16.01	18.42	79.90	21.27

Find the vlaues of y when (i) x= 160 ft and (ii) x=410 ft.

UNIT-II

3 Using Runge-Kutta method of order 4, solve $\dfrac{dy}{dx} = \dfrac{y^2 - x^2}{y^2 + x^2}$ with $y(0) = 1$ at $x=0.2$, 0.4.   L3   12M

OR

4 Compute $\displaystyle\int_{0.2}^{1.4} \left(\sin x - \log x + e^x \right) dx$ using Simpson's 3/8th rule.   L3   12M

UNIT-III

5 Find the Laplace transform of $t^2 e^{-t} \sin 3t + \dfrac{\cos at - \cos bt}{t}$.   L3   12M

OR

6 Solve $(D^2 + 1)x = t \cos 2t, x = Dx = 0$ at $t = 0$ by transform method.   L3   12M

UNIT-IV

7 Expand the function $f(x) = x \sin x$ as a Fourier series in the interval $-\pi \le x \le \pi$ and hence deduce that $\dfrac{1}{1.3} - \dfrac{1}{3.5} + \dfrac{1}{5.7} - \dfrac{1}{7.9} + \ldots = \dfrac{\pi - 2}{4}$.   L3   12M

OR

8 a) Obtain the cosine series for $f(x) = x, in\ 0 \le x \le \pi$.   L3   6M
   b) Obtain the half range sine series for e^x in $0 < x < l$.   L3   6M

UNIT-V

9 Find the Fourier transform of $f(x) = \begin{cases} 1 - x^2, & |x| \le 1 \\ 0, & |x| > 1 \end{cases}$.   L3   12M

Hence evaluate $\displaystyle\int_0^\infty \dfrac{x \cos x - \sin x}{x^3} \cos \dfrac{x}{2}\, dx$.

OR

10 Show that $F_s[xf(x)] = -\dfrac{d}{ds}\{F_C(s)\}; F_c[xf(x)] = \dfrac{d}{ds}\{F_s(s)\}$ and hence find the Fourier sine and cosine transform of xe^{-ax}.   L3   12M

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

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

UNIT-I

1	a)	Discuss the evolution of computers.	L2	6M
	b)	Explain different Computers and its applications	L2	6M

OR

2	a)	Explain the various software and hardware parts of microprocessors.	L2	6M
	b)	Discuss different computer languages	L2	6M

UNIT-II

3	a)	Draw and explain the timing diagrams of read cycle in 8051.	L2	6M
	b)	Distinguish between jump and call instructions.	L4	6M

OR

4	a)	Explain Addressing modes of 8085 apply with examples.	L3	6M
	b)	Draw and explain pin diagram of 8085.	L2	6M

UNIT-III

5	a)	Draw and explain the block diagram of 8051 microcontroller.	L2	6M
	b)	With the diagram explain how 8051 interfaced to external memory.	L4	6M

OR

6	a)	Explain the different serial communication modes in 8051.	L2	6M
	b)	Describe the different modes of operations of Timers/Counters in 8051with its associated registers.	L1	6M

UNIT-IV

7	a)	Explain Internal diagram 8051.	L2	6M
	b)	Explain arithmetic operations in 8051.	L4	6M

OR

8	a)	Discuss the types of addressing modes apply with suitable examples in 8051.	L3	6M
	b)	Explain Data transfer instructions with examples.	L4	6M

UNIT-V

9	a)	Design microcontroller based stepper motor control.	L6	6M
	b)	Design a program for keyboard interfacing with 8051.	L6	6M

OR

10	a)	Design traffic light control system using 8051.	L6	6M
	b)	Interface A/D converter with 8051.	L4	6M

OR

8	A fixed beam AB of length 3 m carries a point load of 45 kN at a distance of 2 in from A. If the flexural rigidity (i.e., EI) of the beam is 1 × 104 kNm2, determine : (i) Fixed end moments at A and B, (ii) Deflection under the load, (iii) Maximum deflection, and (iv) Position of maximum deflection.	L1 12M

UNIT-V

9	Analyse the quarter circle beam fixed at one end and free at other carrying a load 'p' at the free end.	L2 12M

OR

10	Analyse the semicircular beam simply supported on three supports equally spaced.	L3 12M

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

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	A thin cylindrical shell with following dimensions is filled with a liquid – atmospheric pressure Length =1.2 m, external diameter = 20 cm, thickness of metal = 8 mm. Find the value of the pressure exerted by the liquid on the walls of the cylinder and the-op stress induced if an additional volume of 25 cm3 of liquid is pumped into the cylinder.-Take E = 2.1 × 105 N/mm2 and Poisson's ratio = 0.33.	L3 12M

OR

2	Determine the maximum and minimum hoop stress across the section of a pipe of 400 mm internal diameter and 100 mm thick, when the pipe contains a fluid at a pressure of 8 N/mm2. Also sketch the radial pressure and hoop stress distribution across the section.	L2 12M

UNIT-II

3	A line of thrust, in a compression testing specimen 15 mm diameter, is parallel to the axis of the specimen but is displaced from it. Calculate the distance of the line of thrust from the axis when the maximum stress is 20 % greater than the mean stress on a normal section	L3 12M

OR

4	A hollow mild steel shaft having 100 mm external diameter and 50 mm internal diameter is subjected to a twisting moment of 8 kNm and a bending moment of 2.5 kNm. Calculate the principal stresses and find direct stress which, acting alone, would produce the same (i) Maximum elastic strain energy. (ii) Maximum elastic shear strain energy, as that produced by the principal stresses acting together. Take Poisson's ratio = 0.25.	L3 12M

UNIT-III

5	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 percentage saving in material, if the material to be used is also the same	L3 12M

OR

|		
6	The maximum normal stress and the maximum shear stress analysed for a shaft of 150 mm diameter under combined bending and torsion, were found to be 120 MN/m2 and 80 MN/m2 respectively. Find the bending moment and torque to which the shaft is subjected. If the maximum shear stress be limited to 100 MN/m2, find by how much the torque can be increased if the bending moment is kept constant.	L2 12M

UNIT-IV

7	Derive Clapeyron's Equation of three Moments.	L4 12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations July- 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. Two brass rods and one steel rod together supports a load as shown in fig. If the stresses in brass and steel are not to exceed 70 N/mm², and 115 N/mm², find the safe load that can be supported. Take E for steel = 2.1x10⁵ N/ mm² and for brass =1x10⁵ N/ mm². The cross-sectional area of steel rod is 1500 mm² and of each brass rod is 1000 mm²   L3   12M
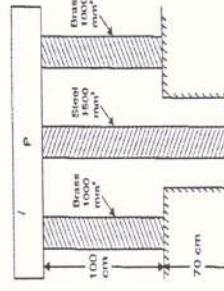
OR

2. a) A steel tube of 30 mm external diameter and 20 mm internal diameter encloses a copper rod of 15 mm diameter to which it is rigidly joined at each end. If, at a temperature of 20°C there is no longitudinal stress, calculate the stresses in the rod and tube when the temperature is raised to 250°C. Take E for steel and copper as 2 x 10⁵ N/mm² and 1 x 10⁵ N/mm² respectively. The value of co-efficient of linear expansion for steel and copper is given as 12 x 10⁶ per °C and 17 x 10⁴ per °C respectively.   L3   9M

   b) Write a note about Principal stress?   L1   3M

UNIT-II

3. A horizontal beam 10 m long is carrying a uniformly distributed load of 2 kN/m. The beam is supported on two supports 6 m apart. Find the position of the supports, so that B.M. on the beam is as small as possible. Also draw the S.F. and B.M. diagrams.   L3   12M

OR

4. A square beam 20 mm × 20 mm in section and 2 m long is supported at the ends. The beam fails when a point load of 400 N is applied at the centre of the beam. What uniformly distributed load per meter length will break a cantilever of the same material 40 mm wide, 60 mm deep and 3 m long?   L3   12M

UNIT-III

5. An I-section beam 350 mm × 150 mm has a web thickness of 10 mm and a flange thickness of 20 mm. If the shear force acting on the section is 40 kN, find the maximum shear stress developed in the I-section.   L3   12M

OR

6. Derive pure torsion equation for a circular shaft with assumptions.   L2   12M

UNIT-IV

7. A beam of uniform rectangular section 250 mm wide and 300 mm deep is simply supported at its ends. It carries a uniformly distributed load of 10.5 kN/m run over the entire span of 5 m. If the value of E for the beam material is 2.1 x 10⁴ N/mm², find :
   (i) The slope at the supports and
   (ii) Maximum deflection.   L3   12M

OR

8. A column of timber section 15 cm × 20 cm is 6 meter long both ends being fixed. If the Young's modulus for timber =17.5 kN/mm², determine :
   (i) Crippling load and
   (ii) Safe load for the column if factor of safety = 3.   L3   12M

UNIT-V

9. A copper cylinder, 90 cm long, 40 cm external diameter and wall thickness 6 mm has its both ends closed by rigid blank flanges. It is initially full of oil at atmospheric pressure. Calculate additional volume of oil which must be pumped into it in order to raise the oil pressure to 5 N/mm² above atmospheric pressure. For copper assume E= 1.0 x 10⁵ N/mm² and Poisson's ratio 1/3. Take bulk modulus of oil as K= 2.6 x 10³ N/mm².   L3   12M

OR

10. A thin cylindrical shell with following dimensions is filled with a liquid at atmospheric pressure: Length = 1.2 m, external diameter = 20 cm, thickness of metal = 8 mm. Find the value of the pressure exerted by the liquid on the walls of the cylinder and the hoop stress induced if an additional volume of 25 cm³ of liquid is pumped into the cylinder take E = 2.1 x 10⁵ N/mm2 and Poisson's ratio = 0.33.   L3   12M

Q.P. Code: 19EE0202

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations July- 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. An unbalanced 4 wire star connected load has a balanced voltage of 400V. The load are $Z1=(4+j8)$ Ω $,Z2=(5+j4)$Ω $,Z3=(15+j20)$Ω .Calculate line currents , current in neutral wire, total power   L4   12M

UNIT-II

3. Derive the transient response of an RLC circuit with AC excitation.   L4   12M

OR

4. In the circuit shown in fig. Determine the complete solution for the current when switch is closed at t=0,applied voltage is $V(t)=50\cos(102\ t+\pi/4)$,resistance R=10Ωand capacitance c=1μF.   L4   12M

UNIT-III

5. Find voltage V for the circuit shown in fig which makes the current in the 10Ω resistor is zero by using nodal analysis?   L2   12M
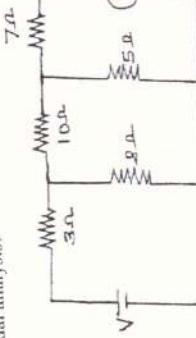
OR

6. For the circuit shown in figure. Find the voltage across 4Ω resistor using nodal analysis.   L2   12M

Q.P. Code: 19EE0202
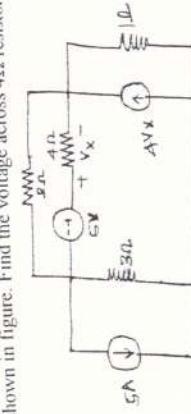
UNIT-IV

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

OR

8. Determine the Z parameters of the following two port network.   L4   12M
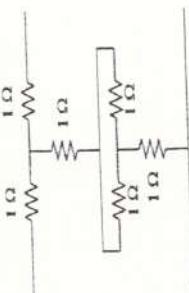
UNIT-V

9. A 500Ω resister, a 16Mh inductor, and a 25 nF capacitor are connected in parallel which is placed in series with a 2000Ω resistor. Express the impedance of this series combination as a rational function of s.   L4   12M

OR

10. 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

Q.P. Code: 19CE0242

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations July- 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)	Explain about Super Nodal analysis and write the steps for applying nodal analysis.	L3	6M
	b)	Calculate the current „I" shown in below figure by using Milliman's theorem.	L5	6M
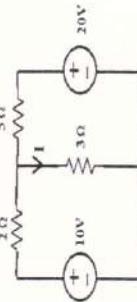
OR

2	a)	Explain about Mesh analysis and write the steps for writing mesh analysis.	L3	5M
	b)	Determine the current in 10Ω resistor for the following network by using nodal analysis.	L1	7M
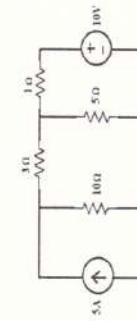
UNIT-II

3	a)	Explain about classification of filters.	L2	4M
	b)	Explain about Propagation constant and Characteristic impedance in T-network filters.	L2	8M

OR

4	Explain about Constant-K band -pass filter in detail.	L2	12M

UNIT-III

5	Derive the Transient Response of series RLC-circuit with D.C excitation.	L2	12M

OR

6	Derive the Transient Response of Series RLC circuit with Sinusoidal excitation.	L2	12M

Q.P. Code: 19CE0242

UNIT-IV

7	Explain about short-circuit parameters.	L3	6M
	Find the h-parameters of the network shown in figure.	L4	6M
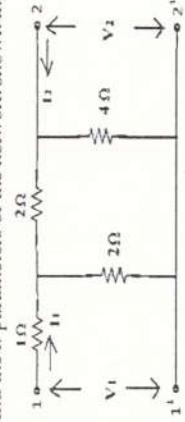
OR

8	a)	The given ABCD parameters are, A=2, B=0.9, C=1.2, D= 0.5. Find Y-parameters	L3	6M
	b)	The given Y-parameters are, Y11= 0.5, Y12= Y21= 0.6, Y22= 0.9.Find Z-parameters.	L3	6M

UNIT-V

9	Write and prove the properties of Fourier transforms	L2	12M

OR

10	Determine the Fourier transforms of the following waveforms shown in figure(a) and figure(b).	L3	12M

R19
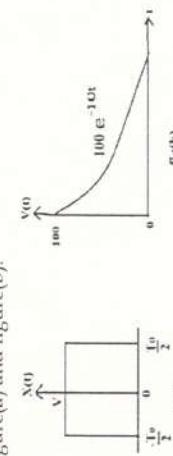
SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations July-2022
SURVEYING & GEOMATICS
(CIVIL)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

1   With neat sketch, explain the prismatic compass by indicating their parts.   L3   12M

OR

2   Explain briefly the obstacles of chaining of a line with neat sketch   L2   12M

UNIT-II

3   The following staff readings were observed successively with a level the   L3   12M
instrument is moved by third sixth and eighth readings. 2.228 :1.606 :0.988
:2.090 :2.864 :1.2620.602 :1.982 :1.044 :2.684 m enter the reading in record book
and calculate R.L. if the first reading was taken at a B.M of 432.383m. Find also
the difference in level between the first and the last points. Use Height of
Instrument method.

OR

4   (a)   Define contour. State the various characteristics of contour lines.   L1   6M
    (b)   Mention the uses of contour in civil engineering works?   L2   6M

UNIT-III

5   For the following traverse, compute the length CD, so that A, D and E may be   L5   12M
in one straight line.

Line	Length(m)	Bearing
AB	110°	83°12´
BC	165°	30°42´
CD	?	346°06´
DE	212°	16°18´

OR

6   The vertical angles to vanes fixed at 0.5m and 3.5m above the foot of the staff   L5   12M
heldvertically at a point were - 00° 30′ and + 10 °12′ respectively. Find the
horizontal distance and the reduced level of the point, if the level of the
instrument axis is125.380meters above datum.

UNIT-IV

7   Explain various elements of a simple curve with a neat sketch.   L4   12M

OR

8   Two straight lines AC and CB, to be connected by a 30 curve, intersect at   L3   12M
achainage of 2760m. The WCBs of AC and CB are 45030′ and 75030′
respectively. Calculate all necessary data for setting out the curve by the
method of offsets fromthe long chord.

UNIT-V

9   Briefly explain the types of EDM instrument   L2   12M

OR

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

R19

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations July-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)	List out different pressure measuring devices and discuss Bourdon's pressure gauge.	L1	6M
	b)	A differential manometer connected at the two points A and B in a pipe containing an oil of specific gravity of 0.9 shows a difference in mercury level as 300 mm. calculate the pressure at the two points	L5	6M

OR

2	a)	Define and write the expression for specific weight, specific volume, specific gravity	L2	6M
	b)	Define atmospheric, gauge, absolute pressures and what are different measuring devices of pressure	L1	6M

UNIT-II

3	a)	Discuss stream function and velocity potential function	L3	6M
	b)	State and prove Bernoulli's energy equation	L4	6M

OR

4	a)	Define flow net and discuss different acceleration of a fluid particle	L1	6M
	b)	What are Energy correction factor and Momentum correction factor	L2	6M

UNIT-III

5	a)	What are the different types of venturi meter and discuss the various components of venturi meter with a neat sketch	L3	6M
	b)	Define pipe and discuss briefly the significance of pipes connected in series	L2	6M

OR

6	a)	Enlist the various flow measuring devices and write the expression for rate of flow of venturi meter	L1	6M
	b)	Derive the Darcy Weisbach equation for loss of head in pipe flow	L4	6M

UNIT-IV

7	a)	Derive an expression for force exerted by a jet of water on moving inclined plate in the direction of jet	L4	6M
	b)	Explain the necessity of hydroelectric power plant	L2	6M

OR

8	a)	Compute (i) force on the plate, (ii) work done and (iii) efficiency of the jet with the help of given data. A nozzle of 30 mm diameter delivers a stream of water at 12 m/s perpendicular to a plate that moves away from the at jet 3 m/s.	L5	6M
	b)	List and describe briefly different components of dam type power plant	L1	6M

UNIT-V

9	a)	Distinguish between reaction turbine and impulse turbine	L3	6M
	b)	What is the necessity of pumps are connected both in series and parallel? Justify	L4	6M

OR

10	a)	What are functions of draft tube	L2	5M
	b)	Derive the expression for specific speed of a centrifugal pump	L4	7M

Q.P. Code: 19EC0402

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations July-2022
ELECTRONIC DEVICES & CIRCUITS
(EEE & ECE)

Time: 3 Hours　　　　　　　　　　　　　　　Max. Marks: 60

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

UNIT-I

1 a) Analyze the current components in a PN diode and determine the expression for diode current equation. L4 6M

b) When a reverse bias is applied to a germanium PN junction diode, the reverse saturation current at room temperature is 0.3μA. Determine the current flowing in the diode when 0.15V forward bias is applied at room temperature. L5 6M

OR

2 a) Define Transition and Diffusion capacitances of a PN Junction Diode. L1 6M

b) Determine the expression for transition capacitance of a PN Junction Diode. L5 6M

UNIT-II

3 a) Draw the circuit diagram of a half wave rectifier and explain its operation with the help of waveforms. L1 6M

b) Inspect the expressions for Average DC current, Average DC Voltage, RMS Value of Current, DC Power Output and AC Power input of a Half Wave Rectifier. L4 6M

OR

4 a) Draw the circuit diagram of Full wave rectifier with inductor filter and illustrate its operation. Also derive the expression for ripple factor. L1 6M

b) Find the value of inductance to be used in the inductor filter connected to a full wave rectifier operating at 60 Hz to provide a dc output with 4% ripple for a 10Ω load. L1 6M

UNIT-III

5 Explain the Input and Output characteristics of a BJT in CE Configuration. Indicate the regions of operations in the output characteristics and list the applications in those regions. L2 12M

OR

6 a) With the help of neat diagram, Explain the operation and characteristics of n-channel enhancement type MOSFET. L2 8M

b) Categorize the difference between depletion and enhancement MOSFET. L4 4M

Q.P. Code: 19EC0402

UNIT-IV

7 a) For the circuit shown in the Figure, solve IB, IC, VCE, VE, VC and VBC. L3 6M
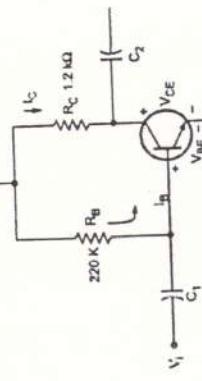
b) Assume that VBE = 0 and β = 50. Interpret Diode Compensation Technique for the parameters VBE and ICO. L2 6M

OR

8 a) Explain Thermal Runaway and Thermal Resistance. L2 6M

b) Solve the Q-point values for the circuit shown in the Fig. L3 6M
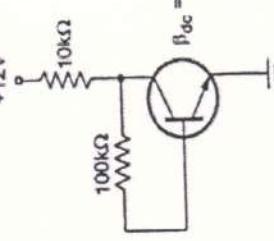
UNIT-V

9 a) With neat diagram, Summarize the parameters of CE amplifier using approximate analysis. L2 6M

b) Examine the expressions for current gain, voltage gain, input impedance and output impedance of CB amplifier using simplified hybrid model. L4 6M

OR

10 a) Develop the expression for current gain, voltage gain, input impedance and output impedance for Common Emitter Amplifier with Emitter Resistor using simplified hybrid model. L3 6M

b) A CE amplifier is driven by a voltage source of internal resistance Rs = 1000Ω and the load impedance of RC=2kΩ. The h-parameters are hie=1.3k, hfe=55, hoe = 22μA, V and hre = 2 x10-4. Neglecting biasing resistors, Estimate the value of current gain, voltage gain, input impedance, output impedance for the value of Emitter Resistor RE = 200Ω inserted in the emitter circuit. L5 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations July-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. Explain the inversions of double slider crank chain with neat sketch and list out the practical applications of inversions.   L3   12M

OR

2. Enlighten the inversions of single slider crank chain with neat sketch and list out the practical applications of inversions?   L3   12M

UNIT-II

3. With neat sketch, explain the Davis steering gear of an automobile   L2   12M

OR

4. (a) Draw the Sketch and Describe the watt mechanism   L1   6M
   (b) Sketch and Describe the working of Peaucellier mechanism   L1   6M

UNIT-III

5. Explain with sketch the instantaneous centre method for determination of velocities of links and mechanisms   L2   12M

OR

6. (a) Draw the displacement, velocity and acceleration diagrams for a follower when it moves with simple harmonic motion.   L3   6M
   (b) Draw the displacement, velocity and acceleration diagrams for a follower when it moves with uniform Acceleration and retardation   L4   6M

UNIT-IV

7. Explain with sketches the different types of followers.   L3   12M

OR

8. Define the following terms i. Cam ii. Follower iii. Offset follower iv. Radial follower   L1   12M

UNIT-V

9. Explain the epicycloid and hypocycloidal forms of teeth with neat sketch   L3   12M

OR

10. Explain briefly the differences between simple, compound, and epicyclic gear trains. What are the special advantages of epicyclic gear trains?   L3   12M

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

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	What are the various characteristics of compound generators?	L1	12M

OR

2	Draw and explain the characteristics of DC series and DC Shunt Generators.	L2	12M

UNIT-II

3	Draw and explain the characteristics of DC series and DC Shunt Motors.	L2	12M

OR

4	Explain the principle of operation of a D.C motor . Derive the equation for the torque Developed by a D.C. motor	L3	12M

UNIT-III

5	Describe Retardation test n detail . What are its advantages and disadvantages	L2	12M

OR

6	Explain in detail about the parallel operation of DC series generators.	L3	12M

UNIT-IV

7	(a)	Discuss the constructional features of transformers. Draw neat Diagrams.	L2	6M
	(b)	A 10KVA, 2200/400V transformer has R1=5 Ω, X1=12 Ω, R2= 0.2 Ω and X2=0.48 Ω. Determine the equivalent impedance of the transformer referred to (i) primary side (ii) secondary side.	L3	6M

OR

8	(a)	Explain the principle of operation of an transformer.	L3	6M
	(b)	Derive the e. m. f. equation of a transformer.	L4	6M

UNIT-V

9	State and explain the various conditions of parallel operation of three-phase transformers	L2	12M

OR

10	A three phase step down transformer is connected to 6600 volts mains and it takes 10A. Calculate the secondary line voltage, line current and output for the following connections. a) delta-star b) star-delta	L3	12M

Q.P. Code: 19EC0403

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations July-2022

SIGNALS, SYSTEMS & RANDOM PROCESSES
(Electronics & Communication Engineering)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	a)	Define the following signals.	L1	6M

i) Periodic & Aperiodic signals   ii) Continuous & Discrete Time signals
iii) Energy & Power signals

b) Explain the following operations on signals with an example.   L2   6M
i) Time Shifting   ii) Time reversal   iii) Time scaling

OR

2 a) Explain the following systems.   L2   6M
i) Linear and Non-Linear systems   ii) Time variant and invariant system

b) Find and Justify whether the system $y(n) = x(n) \, x(n-1)$ is   L3   6M
i) Static or dynamic ii) Causal or Non-Causal iii) Time Variant or Time
Invariant

UNIT-II

3 a) Discuss Trigonometric and Exponential Fourier series with suitable relations.   L2   6M
b) Define and prove any three properties of Fourier Series.   L2   6M

OR

4 a) Prove the following properties of Fourier Transform.   L2   6M
i) Scaling   ii) Frequency Shifting   iii) Time Shifting

b) Find the Fourier transform of the following signals.   L3   6M
i)Signum function   ii) Unit Step function   iii) Constant 'A'

UNIT-III

5 a) What is linear time invariant (LTI) system? Derive an expression for the   L1   6M
transfer function of LTI system.

b) Derive the expression for the step response of a Linear Time Invariant System.   L2   6M

OR

6 a) Explain the concept of convolution in time domain.   L2   2M
b) Find the Graphical convolution of the functions x(t) and y(t) as shown below.   L3   10M
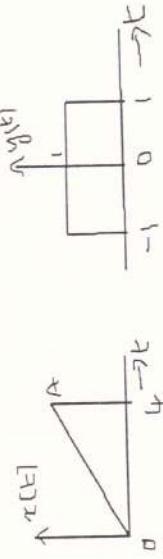
UNIT-IV

7 a) Define Laplace transforms & its inverse along with Region of Convergence   L1   6M
(ROC).

b) Find the unilateral Laplace Transform of the following signals   L3   6M
i) $\delta(t)$ ii) $e^{-t}u(t)$

Q.P. Code: 19EC0403

OR

8 a) State and prove bayes theorem.   L2   4M
b) The density function of a random variable X is   L3   8M

$$f_X(x) = \begin{cases} 5\,e^{-5x} & 0 \le x \le \infty \\ 0 & else\ where \end{cases}$$

Find   i) E[X]   ii) E[(X-1)²]

UNIT-V

9 a) Derive the expression for power density spectrum of a random process.   L2   6M
b) Write the properties of power spectral density.   L2   6M

OR

10 a) Explain the concept and classification of stochastic process.   L2   6M
b) Find the autocorrelation function and power spectral density of the   L3   6M
random processes x(t)= A cos (wt+o) where o is random variable over the
ensemble and uniformly distributed random variable over the range (0,
2π).

Q.P. Code: 19CS0506

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations July-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	Differentiate betweenRelationship and Relationship set.	L5 12M

OR

2	(a)	Implement the DDL Commands – Table Creation, Altering the table structures, truncating a table and dropping a table.	L2	6M
	(b)	Implement the DML Commands – Insert, Select Commands, update& delete Commands.	L2	6M

UNIT-II

3	(a)	Define NULL VALUE? Describe the effect of null values in database	L1	6M
	(b)	Describe different types of aggregate operators with examples in SQL	L2	6M

OR

4	(a)	Explain the working of union, intersection and except operations.	L3	6M
	(b)	Give a examples ofclauses SELECT with an example.	L2	6M

UNIT-III

5	Explain in detail Lossless join decomposition and dependency preserving decomposition with suitable example.	L3	12M

OR

6	(a)	Define functional dependencies. How are primary keys related to FD's	L1	6M
	(b)	What is redundancy? What are the problems caused by the redundancy	L1	6M

UNIT-IV

7	(a)	What are the states of transaction.	L1	6M
	(b)	What are the two statements regarding transaction.	L1	6M

OR

8	Identify the Validation based protocols.	L3	12M

UNIT-V

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

OR

10	(a)	What are the types of storage devices	L1	6M
	(b)	Explain Buffer Management in concurrency control system	L3	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations July-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)	Explain about Data independence.	L2	6M
	(b)	Implement the DML Commands – Insert, Select Commands, update & delete Commands.	L1	6M

OR

2	Explain about the Architecture of Database system.	L2	12M

UNIT-II

3	Explain different types of Attributes with an example.	L2	12M

OR

4	Draw the ER diagram for Banking Applications and explain it.	L2	12M

UNIT-III

5	Explain about the form of basic SQL query with an example.	L2	12M

OR

6	a)	To solve: i. Write a query to find name and age of sailors who have rating above 7. ii. Write a query to find the name of sailors who have reserved at least two boats.	L6	6M
	b)	Discuss about GROUP BY clauses and HAVING clauses.	L2	6M

UNIT-IV

7	Define normalization. List and Explain different normal forms with examples.	L2	12M

OR

8	(a)	Illustrate redundancy and the problems that it can cause?	L3	6M
	(b)	Explain about properties of decompositions?	L2	6M

UNIT-V

9	(a)	Explain different types of locks.	L2	6M
	(b)	Discuss about Times tamp based locking protocols?	L6	6M

OR

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

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations July-2022
LINUX PROGRAMMING
(ECE)

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

UNIT-I

1		What is meant by path and pathname in Unix? Explain them in detail?	L1	12M

OR

2	(a)	What are the file types available in Unix? Discuss file operators with suitable examples?	L1	6M
	(b)	Illustrates about standard streams?	L2	6M

UNIT-II

3	(a)	Explain command substitution with example.	L2	6M
	(b)	Explain about Command Execution?	L2	6M

OR

4		Describe how to resume foreground and kill background job by using various kill options.	L2	12M
		What is an option? Mention at least three options and their use?	L1	

UNIT-III

5		Explain talk and write command.	L2	12M

OR

6		How remote access is done in Unix, detail it.	L1	6M

UNIT-IV

7		Explain about a Variable and distinguish between a variable and a value.	L2	12M

OR

8		Illustrate (i) Atoms ii) Operators	L4	12M

UNIT-V

9		Explain about C shell and its features.	L2	12M

OR

10		How decision making is done? Explain with program.	L1	12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations July-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)

1.
   (a) What is the equation for F that exist between two unlike charges?   L1   2M
   (b) What are the applications of ampere's circuit law?   L1   2M
   (c) Define Faradays Law.   L2   2M
   (d) What is meant by plane polarization?   L2   2M
   (e) Define SWR.   L1   2M

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

2. Three Point Charges Q_1=1 mc, Q_2=2 mc and Q_3=-3 mc are respectively located at   L3   10M
    (0,0,4), (-2,6,1) and (3,-4,-8). Calculate the electric force and electric field on Q_1 due
    to Q_2 and Q_3.

OR

3. (a) A Point Charge 100 pC is located at (4,1,-3) while the x-axis carries charge 2ηC/m. If   L3   5M
        the Plane z=3 is also carries charge 5ηC/m^2, find E at (1,1,1).
    (b) Define Gauss Law. Explain about its applications   L3   5M
UNIT – II
4. Explain any two applications of Ampere's Circuit law.   L2   10M
OR
5. Find H for a straight current carrying conductor using Biot Savart's law and Ampere's   L1   10M
    Circuit law.
UNIT - III
6. Classify Maxwell equations for electrostatic fields in both differential and integral   L1   10M
    form.

OR

7. (a) Prove that the Displacement Current Density $J_D = \dfrac{\partial D}{\partial t}$.   L5   5M

    (b) Explain the motional EMF and derive the expression for the maxwell equation.   L5   5M
UNIT - IV
8. Electric field in free space is given by E=50 cos($10^8 t + \beta x$) a_y,v/m   L3   10M
    a). Find the direction of wave propagation.
    b). Calculate β and the time it takes to travel a distance of λ.
    c). Sketch the wave at t=0,T/4 and T/2.

OR

9. Discuss about pointing theorem and poynting vector.   L2   10M
UNIT - V
10. (a) Explain about S-Circle, r-Circle and x-Circle in smith chart.   L2   5M
    (b) A distortion less line has Z0=60 Ω Attenuation constant = 20 mNp/m and u=0.6c (c is   L3   5M
        velocity of light) Find the primary parameters of the transmission line(R L C G and λ)
        at 100MHz.

OR

11. Explain about the smith chart for finding the SWR and Reflection co-efficient.   L2   10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary Examinations July-2022
MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
(EEE & CSE)

Time: 3 hours   Max.Marks: 60

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

1.
(a)	What is Elasticity of demand?	L1	2M
(b)	Explain Economies of scale?	L2	2M
(c)	What are the objectives of pricing?	L1	2M
(d)	Explain components of working Capital.	L1	2M
(e)	Explain the types of accounts and its rules.	L1	2M

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

2.   What is the significance of Managerial Economics in decision making   L2   10M

OR

3.   State the 'Law of Demand'. What are the various factors that determine the demand   L3   5M
for a Mobile Phone?

UNIT – II

4.   Define Break-even point and state the assumptions.   L2   10M

OR

5.   From the following information relating to Hi-Tech publishers you are required to find   L2   10M
out (A) Break-even point in units (B) Margin of Safety (C) Profit. Also calculate the
volume of sales to earn a profit of Rs.6,000.
fixed costs – Rs.4,500,   Total Variable costs – Rs.7,500
Total sales - Rs.25,000, Units Sold - 5000 units

UNIT – III

6.   Explain how price is determined under perfect competition.   L2   10M

OR

7.   What is meant by economic liberalization, economic privatization and globalization?   L5   10M

UNIT – IV

8.   The cost of a project is Rs.50,000 which has an expected life of 5 years. The cash   L2   10M
inflows for next 5 years are Rs.24,000; Rs.26,000; Rs.20,000; Rs.17000 and
Rs.16,000 respectively. Determine the Payback period.

OR

9.   Consider the case of the company with the following two investment alternatives each   L5   10M
costing Rs.9 lakhs. The details of cash inflows are as follows

Year	Project1	Project2
1	3,00,000	6,00,000
2	5,00,000	4,00,000
3	6,00,000	3,00,000

The cost of capital is 10% per year. Which are will you Choose
(a) NPV method. (b) Under IRR method.

UNIT – V

10. What is meant by Ratio analysis? Explain briefly about various types of ratios.   L1   10M

OR

11. a) Calculate debtors turnover ratio and debtors collection period, if credit sales for   L5   5M
the year Rs.9,00,000, debtors Rs.90,000 and bills payable Rs.60,000.
b) Calculate the acid test ratio , if current assets Rs.8,00,000; Current liabilities   L5   5M
Rs.4,00,000; and Stock Rs. 2,20,000.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary Examinations July-2022
OPERATING SYSTEMS
(CSE)

Time: 3 hours

Max.Marks: 60

PART-A
(Compulsory Questions)

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

(a) What are Batch systems?	L1	2M
(b) What are the types of scheduler?	L1	2M
(c) Define Starvation in deadlock?	L1	2M
(d) Define Partition Control Block?	L1	2M
(e) What are the different methods for allocation in a File System?	L1	2M

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

2. Explain the different functions of an operating system and discuss the various services provided by an operating system.   L6   10M

OR

3. a) Explain difference between Multitasking and Multi Programming?   L2   5M
   b) Explain briefly User and Operating System Interface   L2   5M

UNIT – II

4. Consider 3 processes P1, P2 and P3, which require 5, 7 and 4 time units and arrive at time 0, 1 and 3. Draw the Gant chart, process completion sequence and Average Waiting time for.   L5   10M
   (i) Round robin scheduling with CPU quantum of 2 time units.
   (ii) FCFS.

OR

5. Explain in detail Inter Process Communication?   L2   10M

UNIT – III

6. What is Monitor? Explain with any example using monitor?   L2   10M

OR

7. Write about Deadlock Prevention Methods?   L5   10M

UNIT – IV

8. Discuss about page replacement algorithms with example   L2   10M

OR

9. Given page reference string: 1,2,3,2,1,5,2,1,6,2,5,6,3,1,3,6,1,2,4,3. Compare the number of page faults for LRU, FIFO and Optimal page replacement algorithm.   L5   10M

UNIT – V

10. Write about different types of operation performed on file.   L3   10M

OR

11. Explain about bit vector and Linked list free space management Techniqu   L2   10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations July 2022
CONTROL SYSTEMS
(Common to EEE & ECE)

Time: 3 hours   Max Marks: 60

PART-A
(Compulsory Questions)

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

1.
(a)	Define control systems?	L1	2M
(b)	Define peak overshoot?	L1	2M
(c)	What is the necessary condition for stability?	L2	2M
(d)	Write the expression for resonant peak and resonant frequency?	L3	2M
(e)	Write the state equation?	L3	2M

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

UNIT - I

2. Find the overall transfer function of the system whose signal flow graph is shown below.   L5   10M

OR
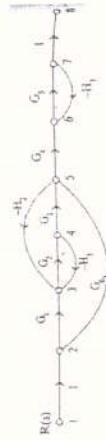
3. For the system represented in the given figure, determine transfer function C(S)/R(S).   L3   10M
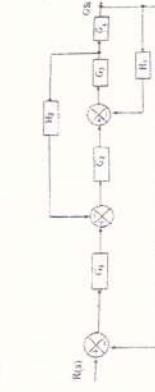
UNIT – II

4. Define steady state error? Derive the static error components for Type 0, Type 1 &Type 2 systems?   L1   10M

OR

5. 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.   L3   10M
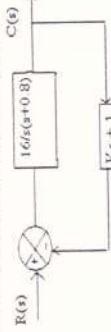
UNIT - III

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

$$G(s)\,H(s) = \frac{K}{S(S+2)(S+4)}.$$ L3   10M

OR

7. With the help of Routh's stability criterion find the stability of the following systems represented by the characteristic equations: L5   10M

(a) $s^4 + 8\,s^3 + 18\,s^2 + 16s + 5 = 0.$

(b) $s^6 + 2s^5 + 8s^4 + 12s^3 + 20s^2 + 16s + 16 = 0.$

UNIT - IV

8. Draw the Bode plot for the following Transfer Function   L3   10M

$$G(s)\,H(s) = \frac{20(0.1s+1)}{s^2(0.25+1)(0.025s+1)}$$

From the bode plot determine (a) Gain Margin (b) Phase Margin (c) Comment on the stability

OR

9. Obtain the transfer function of Lead Compensator, draw pole-zero plot and write the procedure for design of Lead Compensator using Bode plot.   L3   10M

UNIT - V

10. (a) Find state variable representation of an armature controlled D.C.motor.   L2   5M

(b) State the properties of State Transition Matrix.   L1   5M

OR

11. For the state equation: $\dot{X} = \begin{pmatrix} 0 & 1 \\ -2 & -3 \end{pmatrix} X + \begin{pmatrix} 0 \\ 1 \end{pmatrix} U$ with the unit step input and the   L3   10M

initial conditions are $X(0) = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$. Solve the following (a) State transition matrix (b) Solution of the state equation.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary Examinations July 2022
ELECTRONIC MEASUREMENTS AND INSTRUMENTATION
(ECE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

1.   Answer the following; (5 X 2 = 10 Marks)
(a)	Define Repeatability.	L1	2M
(b)	What is the use of phosphor in a CRT.	L1	2M
(c)	What is distortion.	L2	2M
(d)	What is a bridge circuit.	L1	2M
(e)	Define transducer.	L1	2M

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

2.	(a)	Explain different types of errors that occur in measurements.	L2	5M
	(b)	Explain about Differential type voltmeter.	L2	5M

OR

3.	(a)	Explain the dynamic response of an instrument.	L2	5M
	(b)	Explain about multirange AC voltmeter.	L2	5M

UNIT – II

4.	Draw the block diagram of a general-purpose oscilloscope (CRO) and explain function of each block.	L4	10M

OR

5.	(a)	State the various applications of an oscilloscope.	L2	5M
	(b)	Explain the function of trigger circuit.	L2	5M

UNIT – III

6.	(a)	Describe with diagram the operation of a Logic analyzer.	L2	5M
	(b)	List the application of wave analyzers.	L2	5M

OR

7.	(a)	With a neat sketch explain the operation of arbitrary waveform generator.	L2	5M
	(b)	What are the different specifications of arbitrary waveform generator?	L2	5M

UNIT – IV

8.	Explain any Two ac bridges to measure unknown Inductance.	L2	10M

OR

9.	Explain the operation of Kelvin Bridge and derive necessary equation	L2	10M

UNIT – V

10.	With a neat sketch explain the operation of LVDT. What are the advantages & disadvantages?	L3	10M

OR

11.	Write short notes on thermometer.	L3	10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary Examinations July-2021
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)	List out the steps that need to design an algorithm.	L1	2M
(b)	Define the divide and conquer method.	L1	2M
(c)	What is Knapsack problem?	L1	2M
(d)	Define Branch-and-Bound method.	L1	2M
(e)	Define class P.	L1	2M

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

2.	Simplify steps involved in performance analysis with example.	L2	10M

OR

3.	(a)	What is asymptotic notation? Explain different types of notations with examples?	L2	5M
	(b)	Illustraté an algorithm for (i) Finding factorial of n number (ii)Sum of n natural numbers	L2	5M

UNIT – II

4.	Analyze the working strategy of merge sort and illustrate the process of merge sort algorithm for the given data: 43, 32, 22, 78, 63, 57, 91 and 13.	L2	10M

OR

5.	Explain the Strassen's algorithm for matrix multiplication and analyze time complexity.	L5	10M

UNIT – III

6.	Construct an optimal solution for Knapsack problem, where n=7, M=15 and (p1,p2,p3,p4,p5,p6,p7)=(10,5,15,7,6,18,3)and(w1,w2,w3,w4,w5,w6,w7)=(2,3,5,7,1,4,1) by using Greedy strategy.	L3	10M

OR

7.	Explain 0/1 knapsack problem by using dynamic programming with an examples.	L2	10M

UNIT – IV

8.	Construct the LC branch and bound search. Consider knapsack instance n=4 with capacity M=15 such that pi={10,10,12,18},wi={2,4,6,9}apply LC branch and bound technique	L6	10M

OR

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

UNIT – V

10.	Construct the non-deterministic algorithms with example.	L3	10M

OR

11.	Determine the classes NP-hard and NP-complete problem with example.	L3	10M

Q.P. Code: 18EC0414

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations July-2022
DIGITAL SIGNAL PROCESSING
(ECE & EEE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

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

1.	(a)	How FFT is more efficient to determine DFT of sequence?	L2	2M
	(b)	Why IIR filters do not have linear phase?	L1	2M
	(c)	What are the characteristics of FIR digital filters?	L3	2M
	(d)	Compare fixed and floating-point arithmetic.	L3	2M
	(e)	What are the advantages of VLIW architecture?	L1	2M

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

UNIT – I

2. Compute the DFT of the three point sequence $x(n) = \{2, 1, 2\}$. Using the same sequence, compute the 6 point DFT and compare the two DFTs. L3 10M

OR

3. (a) Give the steps involved in implementing Radix –2, DIT FFT algorithm. L3 5M
   (b) Determine circular convolution between the following sequences by using concentric circle method $x(n)= \{2,1,2,1\}$ $h(n)= \{1,2,3,4\}$. L3 5M

UNIT – II

4. (a) Derive the expression for Bi linear Transform. L2 5M
   (b) Explain the differences between Direct form-I and Direct form-II structures. L2 5M

OR

5. (a) Design a Chebyshev filter with a maximum pass band attenuation of 2.5 dB at a frequency of 20 rad/sec and the stop band attenuation of 30 dB at a frequency 50 rad/sec. L5 5M
   (b) Explain Cascade and Parallel realization techniques of IIR digital filters. L2 5M

UNIT – III

6. (a) Distinguish between FIR and IIR filters. L4 5M
   (b) Implement Linear phase FIR filter structure for 'N' is Odd. L2 5M

OR

7. (a) Design an FIR digital low pass filter with cutoff frequency 1.2 radian and length $N = 7$. Use frequency sampling method L5 5M
   (b) Realize the linear phase filter with response
   $h(n)= \partial(n)-4\partial(n-1)+2\partial(n-2)- \partial(n-3)+ \partial(n-4)- \partial(n-5)+2\partial(n-6)-4\partial(n-7)+\partial(n-8)$. L3 5M

Q.P. Code: 18EC0414

UNIT – IV

8. Explain the characteristics of a limit cycle oscillation with respect to the system described by the equation $y(n)=0.95y(n-1) + x(n)$, when the product is quantized to 5 bits by rounding. The system is excited by an input $x(n)=0.75$ for n=0 and $x(n)=0$ for n≠0. Also, determine the dead band of the filter. L2 10M

OR

9. (a) Tabulate the Quantization error ranges of truncation and rounding for the various number representations. L2 5M
   (b) Discuss about the steady state output noise power. L2 5M

UNIT – V

10. (a) Explain the difference between Von Neumann architecture and Harvard architecture for computer. Which architecture is preferred for DSP applications and why? L2 5M
    (b) Explain instruction pipelining with an example and show how it increases the throughput efficiency. L2 5M

OR

11. (a) Explain in brief memory access schemes in DSP processors. L2 5M
    (b) Briefly explain the following for TMS320C5X:
        i) Flags available in status register   ii) Parallel Logic Unit. L2 5M

UNIT - IV

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

OR

9. Discuss Storage allocation strategies with suitable examples?   L2   10M

UNIT - V

10. Describe about optimization techniques on Basic Blocks with simple examples?   L2   10M

OR

11. Construct the DAG for the following basic blocks   L3   10M

   1. t1:=4*i
   2. t2:=a[t1]
   3. t3:=4*i
   4. t4:=b[t3]
   5. t5:=t2*t4
   6. t6:=prod+t5
   7. prod:=t6
   8. t7:=i+1
   9. i:=t7
   10. if i<=20 goto 1

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Supplementary Examinations July/August- 2022

COMPILER DESIGN
(CSE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

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

1.
(a) Differences between compiler and Interpreter,   L4   2M
(b) What is Role of Parser?   L1   2M
(c) Differences between SLR,CLR, LALR parsers?   L3   2M
(d) Describe scope and life time of variable.   L2   2M
(e) Give the different forms in target program   L2   2M

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

UNIT - I

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

OR

3.
(a) Explain the Structure of Compiler?   L3   5M
(b) What is the need for separating lexical analysis and syntax analysis?   L2   5M

UNIT - II

4.
(a) Construct the recursive decent parser for the following grammar?   L3   5M

   E-> E+T/T
   T-> T*F/F
   F-> (E)/id

OR

(b) Explain about Left factoring and Left Recursion with an examples?   L2   5M

5. Consider the grammar   L3   10M

   S->AB| ABad
   A->d
   E->b
   D->b| ε
   B->c

Construct the predictive parse table and check whether the given grammar is LL(1) or not.

UNIT - III

6. Construct CLR Parsing table for the given grammar   L3   10M

   S->CC
   C->aC/d

OR

7. Explain the Translation scheme of SDD.   L2   10M

R18

Max.Marks: 60

Time: 3 hours

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

1.			
(a)	What is the function of a chip breaker?	L1	2M
(b)	Define cutting speed.	L1	2M
(c)	Draw the split nut.	L3	2M
(d)	Name the different types of the drilling machines?	L1	2M
(e)	Name the lap materials generally used.	L2	2M

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

2.	Explain the formation of chip. Discuss the types of chips with neat sketches.	L2	10M

OR

3.	Give the short notes on ASA system and ORS system. Show the inter relationship equations between ASA and ORS system.	L4	10M

UNIT – II

4.	Draw a Merchant"s circle diagram and derive expressions to show relationships among the different forces acting on the cutting tool and coefficient of friction.	L2	10M

OR

5.	(a)	Explain the stress and strain acting on a chip.	L2	5M
	(b)	Define cutting speed, feed, and depth of cut.	L1	5M

UNIT – III

6.	Draw the engine lathe and label the parts. Discuss the functions of the lathe parts.	L3	10M

OR

7.	Explain lathe machine accessories with neat sketches.	L3	10M

UNIT – IV

8.	Explain with neat sketches any one of the following i) Radial drilling machine ii) Sensitive drilling machine iii) Gang drilling machine.	L2	10M

OR

9.	Explain briefly plain indexing and differential indexing with suitable example.	L2	10M

UNIT – V

10.	Give the comparison among Grinding, lapping and honing.	L2	10M

OR

11.	Explain with the help of neat sketch 3-2-1 principle of location.	L3	10M

Q.P. Code: 18EC0415

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary Examinations July/August-2022
DIGITAL COMMUNICATIONS
(ECE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

1.   Answer the following; (5 X 2 = 10 Marks)
   (a)   What is meant by code word length?   L1   2M
   (b)   How the raised cosine spectrum obtained in baseband transmission?   L3   2M
   (c)   Draw the block diagram of integrator?   L3   2M
   (d)   List the advantages of Passband transmission   L2   2M
   (e)   Define the term Hamming distance in coding.   L1   2M

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

2.   Explain the delta modulation system with suitable diagrams?   L2   10M
                                    OR
3. a) Explain the Process of Quantization through one Example?   L2   5M
    b) Classify the types of Quantization ?   L4   5M

UNIT – II

4.   Explain in detail about Inter symbol interference and its effects?   L2   10M
                                    OR
5.   Derive the expression for the Nyquist criterion for distortion less baseband   L4   10M
      transmission in the absence of noise in terms of time domain & Frequency domain

UNIT – III

6.   Draw the block diagram of the structure and behavior of Matched filter Receiver?   L4   10M

                                    OR
7. a) Explain the the concept of Schwarz Inequality   L2   5M
    b) Explain signal representation of a signal N=2and M=3.   L4   5M

UNIT – IV

8. a) Sketch with a neat diagram of M-array PSK transmitter and receiver   L3   5M
    b) What are the parameters you can consider to choose the modulation   L5   5M
        techniques.
                                    OR
9.   Draw the block diagram of QPSK transmitter & receiver and explain each block in   L4   10M
      detail

UNIT – V

10. a) What are the types of parity check codes explain with neat diagrams?   L3   5M
    b) Explain the concept of Parity check matrix for linear block codes.   L2   5M
                                    OR
11 a) Explain the Convolutional Encoding and Decoding methods   L2   5M
    b) Discuss in brief about sequential decoding of convolutional codes   L3   5M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary Examinations July/August-2022
ELECTRICAL MEASUREMENTS
(EEE)

Time: 3 hours

Max.Marks: 60

PART-A
(Compulsory Questions)

1.
            Answer the following; (5 X 2 = 10 Marks)
   (a) List Applications of Electrostatic Voltmeter   L1   2M
   (b) Write short notes on Sensitivity of Wheatstone bridge   L3   2M
   (c) Draw a neat figure of a C R O.   L3   2M
   (d) How the CT and PT are connected in the circuits   L2   2M
   (e) What are the Advantages of AC Bridge   L1   2M

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

2. Explain the working of universal shunt used for multi range ammeters and derive   L2   10M
   expressions for resistances of different sections of a universal shunt for 3 range
   ammeter

OR

3. How do you extend the range of an Ammeter? Explain Aryton Shunt with diagram.   L2   10M

UNIT – II

4. Explain how insulation resistance of a cable can be measured with a help of Loss of   L2   10M
   charge method?

OR

5. Derive the general balance equation of DC and AC Bridges with suitable diagrams.   L4   10M
   What are the balance condition equations in polar and Rectangular forms?

UNIT – III

6. Give the constructional details of electro dynamometer type wattmeter with a neat   L2   10M
   sketch.

OR

7. Explain with a neat sketch the construction and working of a single-phase   L2   10M
   Dynamometer type Wattmeter.

UNIT – IV

8. Explain the construction of (i) Current transformer (ii) Potential transformer   L3   10M

OR

9. a) Describe the construction and working of a d.c potentiometer.   L4   5M
   b) How do you measure current and voltage using potentiometer   L1   5M

UNIT – V

10. Describe the method for determination of B.H curve of a magnetic material using: (i)   L2   10M
    Method of Reversals (ii) Six point method.

OR

11 a) How do you measure leakage factor using Flux meter   L1   5M
   b) Explain the method of measuring core losses using A.C potentiometer method.   L2   5M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester (R18) Supplementary Examinations July/August-2022

THERMAL ENGINEERING
(MECH)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

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

1. (a)	What are the important basic components of an IC engines	L1	2M
(b)	State how the air compressors are classified.	L1	2M
(c)	What is Saturation temperature	L2	2M
(d)	State the organs of a steam condensing plant.	L1	2M
(e)	Classify the steam turbine with respect to the action of the steam	L1	2M

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

UNIT – I

2. a)	Give explanation about the Working Principle of 2-Stroke SI Engine	L2	5M
b)	Express the Working Principles of 2-Stroke Diesel Engine	L1	5M

OR

3. Following observations were recorded during a test on a single cylinder oil engine:Bore = 300 mm, Stroke = 450 mm, Speed = 300 rpm, i.m.e.p. = 6 bar, net brake laod = 1.5 kN, brake drum diameter = 1.8 m, brake rope diameter = 2 cm. Calculate: i) Indicate power, ii) Brake power, iii) Mechanical efficiency.   L4   10M

UNIT – II

4. a) Construct an expression for minimum work required for two stage reciprocating air compressor with perfect inter-cooling and neglect clearance volume   L2   5M

b) A single stage reciprocating compressor takes I m³ of air per minute at 1.013 bar and 15°C and delivers it at 7 bar. Assuming that the law of compression is pV$^{1.35}$= constant, and the clearance is negligible, calculate the indicated power.   L4   5M

OR

5. An air compressor takes in air 1 bar and 20 oC and compresses it according to law to pV$^{1.25}$ = constant. It is then delivered to a receiver at a constant pressure of 10 bar. R= 0.287 kJ/kg K. Determine: i). Temperature at the end of compression, ii) Work done, iii) Heat transferred during compression per kg of air   L4   10M

UNIT - III

6. a) List out the methods of increasing the thermal efficiency of Rankine cycle.   L2   5M

b) Calculate the fuel oil consumption required in a industrial steam plant to generate 5000 kW at the turbine shaft. The calorific value of the fuel is 40000 kJ/kg and the Rankine cycle efficiency is 50%. Assume appropriate values for isentropic turbine efficiency, boiler heat transfer efficiency and combustion efficiency   L4   5M

7. Steam at a pressure of 15 bar and 250°C is expanded through a turbine at first to a pressure of 4 bar. It is then reheated at constant pressure to the initial temperature of 250ºC and is finally expanded to 0.1 bar. Using mollier chart, estimate the work done per kg of steam and amount of heat supplied   L4   10M

OR

UNIT – IV

8. Steam having pressure of 10.5 bar and 0.95 dryness is expanded through a convergent-divergent nozzle and the pressure of steam leaving the nozzle is 0.85 bar. Find the velocity at the throat for maximum discharge conditions. Index of expansion may be assumed as 1.135. calculate mass rate of flow of steam through the nozzle.   L3   10M

OR

9. Explain about Surface condenser and discuss its types with neat sketches   L2   10M

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   L4   10M

OR

11 Explain about the various methods of Governing steam turbines with neat sketches   L2   10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary Examinations July 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) What are the fundamental sources of energy?   L1   2M
   (b) Define solar pond.   L2   2M
   (c) What are the advantages of wind power?   L2   2M
   (d) What are the methods used to analysis of biomass?   L1   2M
   (e) What is hydrogen fuel?   L2   2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT – I
2.   (a) What is the need of renewable energy?   L5   5M
   (b) Describe Renewable Energy Scenario in Andhra Pradesh.   L2   5M
OR
3.   (a) Write a short note on the use of wind sock in aviation industry.   L3   5M
   (b) Explain briefly about the secondary sources of Energy.   L2   5M
UNIT – II
4.   Describe with a neat sketch working of a solar water heating system and   L5   10M
   state its 12M advantages and disadvantages.
OR
5.   Explain the working of water heating system and desalination system with   L5   10M
   a neat sketch.
UNIT – III
6.   Classify the wind turbines and explain their working in detail.   L1   10M
OR
7.   Describe the working of VAWT with its merits and demerits.   L6   10M
UNIT – IV
8.   Explain the working of biomass Cogeneration system with a neat sketch   L3   10M
   and also mention its applications.
OR
9.   (a) What are the factors affecting the generation of bio gas?   L3   5M
   (b) Explicate various steps involve in the production of Ethanol.   L4   5M
UNIT – V
10.   Explain the basic components of a tidal power plant and state their merits
   and demerits.   L3   10M
OR
11.   Explain in detail the wave energy conversion by floats.   L3   10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations July-2022
ESTIMATION, COSTING AND VALUATION
(CIVIL ENGINEERING)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1. a) Differentiate between long wall and short wall method and centre line method   L4 6M
   b) Differentiate between Abstract estimate and Detailed Estimate   L4 6M

OR

2. a) What are the different items of work considered while estimation building.   L2 4M
   b) Calculate the following items from the plan and section given in the fig. using centre line method: L3 8M
      (i) Excavation for foundations.
      (ii) Cement Concrete (1:6:18) in foundations.
      (iii) Brick Work in cement mortar (1:6) in foundations and plinth
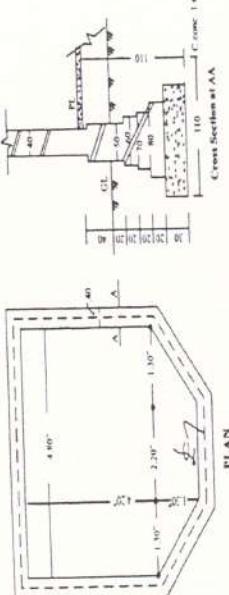
UNIT-II

3. a) Define turfing. Give the equation for calculating turfing area for a road in banking having formation width 'B', formation depth 'd', side slopes S:1 (H:1) and length 'L'   L2 4M
   b) Estimate the Quantity of earth work for a portion of road from the following data   L3 8M

Chainage	0	1	2	3	4	5	6	7	8	9
RL	7.50	7.70	7.50	7.25	6.85	6.95	6.70	6.45	6.30	5.95

The formation level at Chainage 0 is 8.0 and having falling gradient of 1 in 100. The top width is 12m and side slopes 1½ horizontal to 1 vertical assuming the transverse direction is in level calculate the quantity of earth work Take 1 chain = 20m by using trapezoidal & Prismoidal formula.

OR

4. a) What are the methods used for calculating volume of earth works? Write Prismoidal formula for calculating quantity of earth, for two sections A1 and A2 which are separated by a distance or length L   L2 4M
   b) Calculate the quantity of earthwork of a portion of a channel with the following data:- Bed width = 3 m; Free board = 44 cm; Slope of digging is 1:1; Side slope of banking 1.5:1; Full supply depth = 1m; Top width of both the bank = 1.5 m.   L3 8M

Rd.(m)	Groundlevel(m)	Proposed bed level (cm)
0	225.24	224.00
30	224.80	223.94
60	224.43	223.88
90	224.12	223.82
120	224.50	223.76
150	224.98	223.70

UNIT-III

5. a) What are different items of work estimated in reinforced cement concrete work?   L1 4M
   b) Prepare a schedule of bars for the RCC lintel shown in figure assuming bearing of the lintel be 15 cm on walls at each side. Weight of 100 mm dia bar = 0.62 kg/m and 6 mm dia bar = 0.22 kg/m   L3 8M
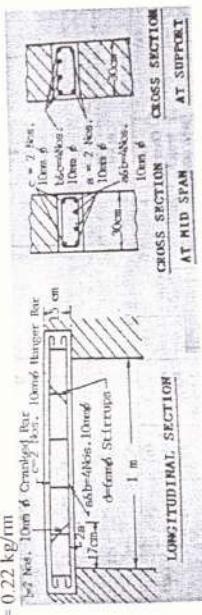
OR

6. a) What are different types of reinforcement bars used in RCC members?   L1 4M
   b) A cantilever RC beam projects beyond the fixed end by 3 m and is 30 cm x 60 cm at fixed end and reduced to 30 cm x 15 cm at the free end. At the fixed end the beam is reinforced with 4 bars 20 mm dia at the top and 2 bars are curtailed at a distance of 1.41 m from the fixed end, but the remaining 2 bars continued up to the free end. The beam is provided with 6 mm dia two legged stirrups 20 cm centre to centre for the entire length. At the bottom there are 2 bars 10 mm dia as stirrup fixture. Weight of bars are 20 mm = 2.47 kg/m, 10 mm = 0.62 kg/m, 6 mm =.22 kg/m. assume 25 mm clear cover and the main bars are suitably anchored, but is not needed in the estimate. Estimate the quantity of reinforcement.   L3 8M
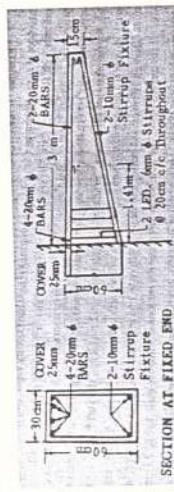
UNIT-IV

7. a) What do you mean by Rate Analysis? Write is the purpose of rate analysis.   L2 6M
   b) Prepare the rate per cu.m for 1:2:4 cement concrete.   L3 6M

OR

8. a) List various expenses that comes under overhead costs   L1 6M
   b) prepare rate per sq.m for laying Mosic or Terrazo title floor   L3 6M

UNIT-V

9. a) Define Specification? Explain different types of specifications   L2 6M
   b) Write general specifications for first class building   L3 6M

OR

10. a) Briefly explain various methods of valuation   L2 6M
    b) Calculate the annual rent of a building with the following data: L3 6M
       Cost of Land   = Rs. 20,000/-
       Cost of building = Rs. 80,000/-
       Estimate life = 80 years
       Return expected = 5%
       on land 6% on building Annual repairs are expected to be 0.8% of the cost construction and other out goings will be 25% of the gross rent. There is no proposal to set up a sinking fund.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations July-2022
POWER ELECTRONICS
(EEE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1 Briefly explain about Insulated Gate Bipolar Transistor (IGBT) and it's   L2   12M
   switching characteristics.

OR

2 Explain the different modes of operation of thyristor with the help of its V-I   L2   12M
   characteristics.

UNIT-II

3 Explain the operation of single phase full wave converter with R-load at   L2   12M
   $\alpha=45^0$ with necessary wave forms. Also derive the output voltage, output
   current and RMS output voltages.

OR

4 Explain the operation of Three phase fully controlled rectifier with RL load   L2   12M
   and also derive the average and RMS load voltage.

UNIT-III

5 Discuss the principle of operation of DC-DC step up chopper, derive average   L2   12M
   output voltage and current equations along with suitable waveforms.

OR

6 The boost converter has an input voltage of Edc= 5V.the required average   L3   12M
   output voltage is E0=15V And the average load current I0=0.5A. The
   switching frequency is 25 kHz. If the L= 150µH and C= 220µF, Determine
   i) the duty cycle
   ii) the ripple current of inductor ΔI
   iii) the peak current of inductor I2,
   iv) The ripple voltage of filter capacitor ΔVC

UNIT-IV

7 Explain the operation of single phase to single phase bridge type step-up   L2   12M
   cycloconverter with continues mode.

OR

8 a) Explain the load commutated Cycloconverter.   L2   6M
   b) What are the applications of Cycloconverter?   L2   6M

UNIT-V

9 a) Draw and Explain V-I Characteristics of TRIAC.   L4   6M
   b) List the applications of ac voltage controller.   L2   6M

OR

10 Draw and Explain the operation of single phase full wave ac voltage   L2   12M
   controller with R load.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations July- 2022
ANTENNAS AND WAVE PROPAGATION
(ECE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	a)	Write a note on Radiation pattern and representation	L1	6M
	b)	Explain Antenna Noise Temperature and Radiation Resistance	L3	6M

OR

2	a)	At any observation point, lying in the plane of maximum radiation, the received electric field strength is 20 µV/m. If the radiating antenna is Half wave dipole operating at 300 MHz at the distance of 300 km away from the point of observation then find out the following: i) Length of the dipole, and ii) Input current to the antenna	L3	6M
	b)	Define directivity and Explain the different techniques to estimate directivity	L2	6M

UNIT-II

3	a)	Discuss about the horn antenna types & its characteristics	L2	6M
	b)	Discuss the design considerations of pyramidal horn antenna	L2	6M

OR

4	a)	Explain the significance of Helical structure in helical antenna	L2	6M
	b)	What is a patch antenna? Explain briefly the different methods of feeds of parabolic reflector antennas	L2	6M

UNIT-III

5	a)	Give the advantages and limitations of micro strip antennas	L1	6M
	b)	A parabolic reflector antenna with diameter 1.8 m is designed to operate at frequency of 6 GHz and illumination efficiency of 0.65. Calculate the FNBW and antenna gain?	L3	6M

OR

6	a)	Write short notes on Coordination system for antenna measurement	L1	6M
	b)	Explain sources of Error in Antenna measurement	L2	6M

UNIT-IV

7	a)	Write short notes on broad side and end fire arrays	L5	6M
	b)	Explain End fire array with increase directivity	L1	6M

OR

8	a)	Compare the Broad side array and End fire array	L5	6M
	b)	Find the minimum spacing between the elements in a broadside array of 10 isotropic radiators to have directivity of 7db	L2	6M

UNIT-V

9	a)	Explain lowest usable high frequency (LUHF) and give its significance	L2	6M
	b)	Explain the relation between MUF and skip distance	L2	6M

OR

10	a)	For a flat earth assume that at 400 km reflection takes place. The maximum density of ionosphere corresponds to a refractive index of 0.9 at 10 MHz. Calculate range for which maximum usable frequency is 10 MHz	L3	6M
	b)	Explain Maximum usable frequency with its expression	L2	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations July-2022
DESIGN OF MACHINE ELEMENTS - I
(MECH)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1 a) Draw the stress–strain diagram for mild steel. Explain.   L2   6M

   b) A shaft, as shown in Fig. is subjected to a bending load of 3 kN, pure torque of 1000 N-m and an axial pulling force of 15 kN. Calculate the stresses at A and B.   L3   6M


OR

UNIT-II

2 a) How do you classify materials for engineering use?   L2   6M

   b) What do you mean by preferred numbers and explain the applications   L1   6M

3 a) Discuss the factors affecting endurance limit.   L2   6M

   b) Determine the diameter of a circular rod made of ductile material with a fatigue strength (complete reversal), σe=265 MPa and tensile yield strength of 350 MPa. The member is subjected to a varying axial load from W min =-300 KN to W max = 700 KN and has a stress concentration factor is 1.8. Use factor of safety as 2.   L2   6M

OR

UNIT-III

4 a) What are the fluctuating stress, repeated stress and reversed stress? Draw the Stress – Time sinusoidal curves   L1   6M

   b) Find the maximum stress induced in the following case taking stress concentration into account: A stepped shaft as shown in Fig. (b) and carrying a tensile load of 12 KN   L3   6M

OR

5 a) Describe the initial stresses in screw fasteners due to screwing up forces.   L3   6M

   b) Mentioned the important terms used in screw threads with a neat sketch.   L2   6M

6 a) What are the advantages of preloading bolted joints?   L1   6M

   b) A steam engine of effective diameter 300 mm is subjected to a steam pressure of 1.5 N/mm2 . The cylinder head is connected by 8 bolts having yield point 330 MPa and endurance limit at 240 MPa. The bolts are tightened with an initial preload of 1.5 times the steam load. A soft copper gasket is used to make the joint leak-proof. Assuming a factor of safety 2, find the size of bolt required. The stiffness factor for copper gasket may be taken as 0.5.   L3   6M

UNIT-IV

7   Design and draw a spigot and socket cotter joint to support a load varying from 30 kN compression to 30 kN in tension. The material used is carbon steel for which the allowable stresses may be used. The load is applied statically. Tensile compressive stress = 50 MPa; shear stress = 35 MPa and crushing stress = 90 MPa   L2   12M

OR

8 a) What type of stresses are induced in shafts?   L1   6M

   b) A solid circular shaft is subjected to a bending moment of 3000 N-m and a torque of 10 000 N-m. The shaft is made of 45 C 8 steel having ultimate tensile stress of 700 MPa and a ultimate shear stress of 500 MPa. Assuming a factor of safety as 6, determine the diameter of the shaft.   L3   6M

UNIT-V

9 a) Discuss the function of a coupling. Give at least three practical applications.   L2   6M

   b) Design and make a neat dimensioned sketch of a muff coupling which is use to connect two steel shafts transmitting 40 kW at 350 r.p.m. The material for the sh and key is plain carbon steel for which allowable shear and crushing stresses ma taken as 40 MPa and 80 MPa respectively. The material for the muff is cast iron which the allowable shear stress may be assumed as 15 MPa.   L1   6M

OR

10   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   L3   12M

UNIT-I

1	a)	Explain the phases of a Compiler	L2 6M
	b)	Write the different compiler construction tools in different phases	L2 6M

OR

2	a)	Explain about Input buffering	L2 6M
	4b)	Explain recognition of tokens with an example	L2 6M

UNIT-II

3	a)	Consider the grammar E->E+T/T, T->T*F/F, F->(E)	id Construct predictive parsing table and check given grammar is LL(1) or not?	L4 6M
	b)	Explain about of Parse trees	L2 6M

OR

4	a)	Find the predictive parser for the following grammar and parse the sentence (a+b)*c. E->E+T|T T->T*F|F F->(E)	id	L4 6M
	b)	Explain elimination of Ambiguity in Given grammar	L2 6M

UNIT-III

5	a)	Define augmented grammar? Construct the LR(0) items for the following Grammar? S->L=R S->R L->*R L->id R->L.	L4 6M
	b)	Define S-attributed and L-attributed grammars	L1 6M

OR

6	a)	What is syntax directed translation? How it is used for translation of expressions?	L2 6M
	b)	Explain about Type Checking?	L2 6M

UNIT-IV

7	a)	What is static allocation strategy? What are its limitations?	L2 6M
	b)	Describe the various fields in an activation record.	L2 6M

OR

8	a)	Write the three address code sequence for the statement x=y*z + y*-z. Also give its triple representation	L2 6M
	b)	Explain different stack allocation strategies with suitable examples.	L2 6M

UNIT-V

9	a)	Define code optimization. What are the principle sources of optimization? Explain in detail.	L2 6M
	b)	Construct the DAG for following statement. a+b*c+d+b*c	L4 6M

OR

10	a)	Construct the DAG for the following basic blocks	L4 8M

1. t1:=4*i
2. t2:=a[t1]
3. t3:=4*i
4. t4:=b[t3]
5. t5:=t2*t4
6. t6:=prod+t5
7. prod:=t6
8. t7:=i+1
9. i:=t7
10. if i<=20 goto 1

	b)	Explain Symbol Table operations	L2 4M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Supplementary Examinations July 2022

HYDRAULIC ENGINEERING

(Civil Engineering)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1. a) Derive an expression for discharge through the open channel flow by chezy's constant. — L1 — 6M
   b) Find the discharge though a circular pipe of diameter 3 m , if the depth of water in the pipe is 1m and the pipe is laid at the slope of 1 in 1000 . Take C=70. — L1 — 6M

OR

2. a) Derive the condition for a rectangular channel to be most efficient. — L1 — 6M
   b) Explain the term specific energy of a flowing liquid and derive the condition for critical depth. — L1 — 6M

UNIT-II

3. a) A hydraulic jump forms at the downstream end of spillway carrying 17.93 m3/s discharge. If depth before jump is 0.80 m, determine the depth after the jump and energy losses. — L3 — 6M
   b) Write about the classification of bottom channel slope. — L1 — 6M

OR

4. a) A sluice gate discharges water into a horizontal rectangular channel with a velocity of 10 m/s and the depth of flow of 1m. Determine the depth of flow after jump and consequent loss in total head. — L3 — 6M
   b) Derive an expression for loss of energy due to hydraulic jump. — L3 — 6M

UNIT-III

5. A 7.5 cm diameter jet having a velocity of 30 m/s strikes a flat plate, the normal of which is inclined at 45 degrees to the axis of the jet. Calculate the normal pressure on the plate.
   (a)When the plate is stationary and
   (b) When the plate is moving with a velocity of 15 m/s and away from the jet. Also determine the power and efficiency of the jet when the plate is moving. — L3 — 12M

OR

6. A jet of water of diameter 7.5 cm strikes a curved plate at its centre with a velocity of 20m/sec. the curved plate is moving with a velocity of 8 m/sec in the direction of jet. The jet is deflected through an angle of 165° . Assuming the plate smooth. Find
   i) Force exerted on the plate in the direction of jet
   ii) Power of jet
   iii) Efficiency of jet — L3 — 12M

UNIT-IV

7. A centrifugal pump is to discharge 0.125m3/sec at a speed of 1400 r.p.m. against a head of 25m. The impeller diameter is250mm,its width at outlet is 50mm and manometric efficiency is 75%. Determine the vane angle at the outer periphery of the impeller. — L3 — 12M

OR

8. a) (a) What it is meant by priming? — L1 — 5M
   b) What is cavitation? What are the effects of cavitation and mention some precautions against cavitation. — L2 — 7M

UNIT-V

9. A Francis turbine working under a head of 30 m has a wheel diameter of 1.2 m at the entrance and 0.6 m at the exit. The vane angle at the entrance is 90 degrees and guide blade angle is 150 degrees. The water at the exit leaves the vane without any tangential velocity and the velocity of flow in the runner is constant. Neglecting the effect of draft tube and losses in the guide and runner passages, determine the speed of wheel in r.p.m. and vane angle at exit. State whether the speed calculated is synchronous or not. If not, what speed would you recommend to couple the turbine with an alternator of 50 cycles? — L3 — 12M

OR

10. The three-jet Pelton turbine is required to generate 1000 kW under a net head of 400 m. The blade angle at outlet is 15 degrees and the reduction in the relative velocity while passing over the blade is 5%. If the overall efficiency of the wheel is 80%, Cv=0.98 and speed ratio =0.46, then find (i) The diameter of jet (ii) Total flow in m3/sec and the force exerted by a jet on the buckets.
   If the jet ratio is not less than 10, find the speed of the wheel for a frequency of 50 hertz/sec and the corresponding wheel diameter. — L1 — 12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Supplementary Examinations July 2022
(EEE)

ELECTRICAL POWER GENERATION &TRANSMISSION SYSTEMS

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	a)	Describe the factors affecting the thermal power plant site selection	L1	6M
	b)	Write the advantages and disadvantages of the thermal power plant	L1	6M

OR

2	Draw a neat schematic diagram of a hydro-electric plant and explain the functions of various components.	L1	12M

UNIT-II

3	a)	Explain the principle of operation Nuclear Reactor.	L2	6M
	b)	What is nuclear fission? And explain in detail about chain reaction.	L2	6M

OR

4	Compare thermal, hydro and nuclear power plants on the basis of technical, mechanical and economical aspects.	L2	12M

UNIT-III

5	a)	Derive an expression for the inductance per phase for a 3-phase overhead transmission line when conductors are symmetrically located	L3	6M
	b)	Calculate the inductance per phase of a 3-phase transmission line as shown in the fig. The radius of the conductor is 0.5cm. The lines are un-transposed.	L3	6M
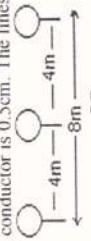
OR

6	Deduce an expression for line to neutral capacitance for a three phase overhead transmission line when the conductors are (i) Symmetrically placed (ii) Asymmetrically placed but transposed	L3	12M

UNIT-IV

7	An overhead 3-phase transmission line delivers 400KW at 11KV at 0.8 pf lagging The resistance and reactance of earth conductors are 1.5Ω and 5Ω per phase respectively. Determine (i) The sending end voltage.(ii) percentage of regulation. And (iii) Transmission efficiency.	L2	12M

OR

8	a)	Prove that relation AD-BC=1 by considering a two terminal pair network for nominal T-method.	L5	6M
	b)	What is surge impedance loading? Explain.	L1	6M

UNIT-V

9	a)	What is *corona*? And explain the factors affecting corona, derive the expressions for critical disruptive and visual critical voltage.	L1	6M
	b)	List the advantages and disadvantages of corona.	L2	6M

OR

10	a)	What are the different types of insulators used in overhead transmission system? And compare them.	L2	6M
	b)	A three phase overhead line is suspended by a suspension type insulator, which Consists of three units. The potential across top unit and middle units are 12kv and 18kv Respectively. Calculate (i) The ratio of capacitance between pin and earth to the self Capacitance of each unit (ii).The line voltage and (iii) String efficiency	L3	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations July 2022
DIGITAL COMMUNICATION
(ECE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	a)	With a neat block diagram explain PCM transmitter and receiver	L2 6M
	b)	Derive the S/N ratio of PCM	L3 6M

OR

2	a)	State and prove sampling theorem.	L2 6M
	b)	Derive the quantization noise in PCM	L3 6M

UNIT-II

|			
3	a)	Derive the expression for impulse response of a matched filter.	L3 6M
	b)	Explain the rectangular pulse for a matched filter	L2 6M

OR

4	a)	Derive the properties of matched filter.	L3 6M
	b)	What is ISI? Draw the basic block diagram of baseband binary data transmission.	L2 6M

UNIT-III

5	a)	Describe the concept of continuous AWGN channel into a vector channel.	L2 6M
	b)	Consider the signals $s_1(t)$, $s_2(t)$, $s_3(t)$, $s_4(t)$, shown in fig. Find the orthogonal basis function using Gram Schmidt orthogonalization procedure	L3 6M

OR
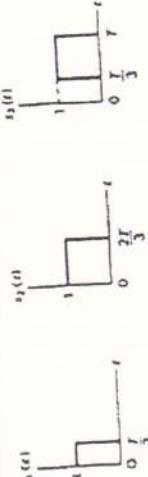
6	a)	Explain the concept of Schwarz Inequality	L2 6M
	b)	Sketch the signal constellation diagrams for N=M=2	L3 6M

UNIT-IV

7	a)	Compare all the digital modulation techniques	L2 6M
	b)	Sketch with a neat diagram of M-array PSK transmitter and receiver	L3 6M

OR

8	a)	How will you differentiate binary PSK and M-PSK, explain with block diagrams?	L2 6M
	b)	Derive an expression for probability of error in BFSK	L3 6M

UNIT-V

9	a)	Explain the concept of matrix representation of Linear block codes	L2 6M
	b)	The Generator matrix(G) for a (7, 4) block code is given below	L3 6M

$$\begin{matrix} 1 & 0 & 0 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 0 & 1 & 1 & 1 \\ 0 & 0 & 1 & 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 & 0 & 1 & 1 \end{matrix}$$

Determine the Parity check matrix (G).

OR

10	a)	Explain the Convolutional Encoding and Decoding methods.	L2 6M
	b)	A generator matrix for a (6, 3) block code is given below	L3 6M

$$\begin{matrix} 1 & 0 & 0 & 0 & 1 & 1 \\ 0 & 1 & 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & 1 & 1 & 0 \end{matrix}$$

Find the all possible code vectors

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations July 2022
MACHINE TOOLS
(MECH)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1 a) What factors influence the formation of the Built-Up-Edge (BUE) and give the   L2   6M
factors to reduce the BUE?
   b) Explain the function of different tool angles associated with the geometry of a   L2   6M
single point cutting tool with neat sketch.

OR

2 a) Give the short notes on ASA system and ORS system. Show the interrelationship   L2   6M
equations between ASA and ORS system.
   b) Explain the types of chips with neat sketches.   L2   6M

UNIT-II

3   Sketch the Merchant's circle diagram and derive expressions to show   L3   12M
relationships among the different forces acting on the cutting tool and coefficient
of friction.

OR

4   The following equation for tool life is given for a turning operation $VT^{0.13} f^{0.77} d$ L3   12M
$^{0.37} = C$. A 60-minute tool life was obtained while cutting at cutting velocity =40
m/min, feed rate =0.15 mm/rev and depth of cut = 2mm. Determine the change in
tool life if the cutting speed, feed and depth of cut an increased by 10%
individually and also taken together.

UNIT-III

5 a) Explain the differences between the conventional lathe and CNC lathe.   L2   6M
   b) Define the working principle of Lathe. Name at least five work holding devices in   L2   6M
Lathe.

OR

6 a) What are the different types of taper turning methods? Discuss any one method   L2   6M
with suitable diagram.
   b) Explain the Apron feed mechanisms in the Engine lathe.   L2   6M

UNIT-IV

7 a) Give the comparison among planer, shaper and slotter operations.   L2   6M
   b) Explain briefly plain indexing and differential indexing with suitable example.   L2   6M

OR

8 a) Discuss briefly with neat sketch, a horizontal boring machine.   L2   6M
   b) Describe the Whitworth quick return mechanism used in shapers.   L2   6M

UNIT-V

9 a) Compare the differences among grinding, lapping and honing operations.   L2   6M
   b) How grinding wheel is specified explain with an example.   L2   6M

OR

10 a) Explain the different factors that need to be considered for selecting the grinding   L2   6M
wheel.
    b) Compare the differences among grinding, lapping and honing operations.   L2   6M

Q.P. Code: 19CS0516

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR

(AUTONOMOUS)

B.Tech III Year I Semester Supplementary Examinations Julyy 2022

DESIGN AND ANALYSIS OF ALGORITHMS

(CSE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	Simplify steps involved in performance analysis with example	L2	12M

OR

2	a)	Explain the collapsing rule for Find algorithm with example	L6	6M
	b)	Solve the following Recurrence relation	L3	6M

i) $T(n) = 4T(n/3) + n^2$ ii) $T(n) = 6T(n/3) + n^2 \log n$

UNIT-II

3	Analyze the working strategy of merge sort and illustrate the process of merge sort algorithm for the given data: 43, 32, 22, 78, 63, 57, 91 and 13.	L4	12M

OR

4	Elaborate BFS algorithm and trace out minimum path for BFS for the following example.	L6	12M
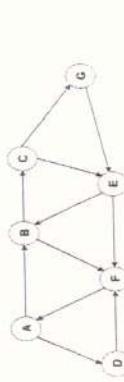
UNIT-III

5	Apply the minimum spanning tree of the following graph using Kruskal's algorithm and prim's algorithm	L3	12M
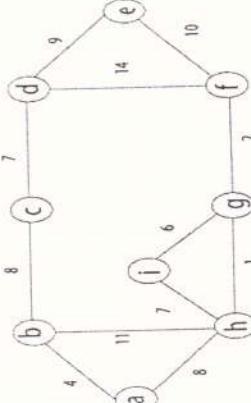
OR

6	Analyze the minimum cost tour for the given travelling sales person problem using dynamic programming concepts.	L4	12M
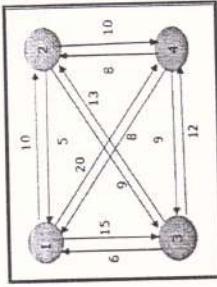
UNIT-IV

7	Explain sum of subsets by using backtracking with an example.	L5	12M

OR

8	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,(p1, p2, p3, p4) = (10, 10, 12, 18), (w1,w2, w 3, w4) = (2, 4, 6, 9) and M = 15.	L4	12M

UNIT-V

9	Construct the non-deterministic sorting algorithm and also analyze its complexity	L6	12M

OR

10	Determine the classes NP-hard and NP-complete problem with example	L5	12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations July-2022
GEOTECHNICAL ENGINEERING
(Civil Engineering)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	a)	Classify various types of soil structures with neat sketch.	L2	6M
	b)	Explain Clay mineralogy.	L2	6M

OR

2	a)	Write short notes on Index Properties of soils.	L2	6M
	b)	Define permeability. Explain various factors affecting permeability	L2	6M

UNIT-II

3	Describe the Standard Proctor test and modified Proctor test to be conducted in the laboratory.	L2	12M

OR

4	a)	Explain pre consolidation pressure.	L2	6M
	b)	Draw the graph representing preconsolidation pressure.	L2	6M

UNIT-III

5	a)	A concentrated load of 2000 kN acts vertically at the ground surface. Determine the vertical stress at a point P which is 6m directly below the load. Also calculate the vertical stress at a point R which is at a depth of 6m but at a horizontal distance of 5m from the axis of the load.	L2	6M
	b)	Explain the concept of 'Westergaards theory' in soils.	L2	6M

OR

6	Explain the principle of the direct shear test. What are the advantages of this test? What are its Limitations?	L2	12M

UNIT-IV

7	a)	What are the factors causes the slope failures.	L1	6M
	b)	Explain different types of slope failures with neat ketches.	L1	6M

OR

8	a)	Explain Taylor's stability number .	L2	6M
	b)	A canal is to be excavated through a soil with c = 15 kN/m2, Φ = 20º, e = 0.9 and G = 2.67. The side slope is 1 in 1. The depth of the canal is 6 m. determine the factor of safety with respect to cohesion when the canal runs full. What will be the factor of safety if the canal is rapidly emptied.	L3	6M

UNIT-V

9	a)	What are the different stages in sub soil exploration?	L1	6M
	b)	Explain various uses of site investigations.	L2	6M

OR

10	Give a detailed account on how Standard Penetration Test is conducted. What are the relevant corrections applied to SPT number?	L2	12M

Q.P. Code: 19EE0212

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations July-2022
**CONTROL SYSTEMS**
(Common to EEE & ECE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	a)	Distinguish between open loop and closed loop control systems	L1	4M
	b)	Write the differential equation governing the mechanical system shown in Fig.1 and determine the transfer function.	L3	8M

Fig.1.

OR
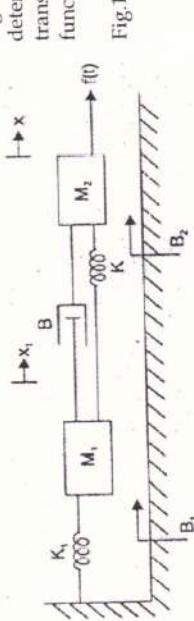
2. Obtain the overall gain C(S)/R(S) from signal flow graph shown in Fig.   L2   12M

UNIT-II
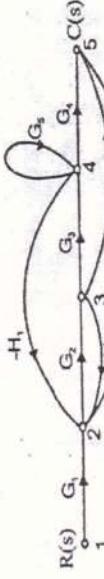
3. a) Find all the time domain specifications for a unity feedback control system   L1   6M

whose open loop transfer function is given by $G(s) = \dfrac{25}{s(s-5)}$

b) A For servo mechanisms with open loop transfer function given below what type of input signal give rise to a constant steady state error and calculate   L3   6M

their values $G(s)H(s) = \dfrac{20(s+2)}{s(s+1)(s+3)}$.

OR

4. a) Define steady state error? Derive the static error components for Type 0 system?   L1   6M

b) The system has $G(s) = K/s(1+sT)$ 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%?   L3   8M

UNIT-III

Q.P. Code: 19EE0212

5	a)	What is the necessary condition for the stability of the system and why it is not sufficient? Explain with an example.	L2	5M
	b)	With the help of Routh's stability criterion find the stability of the following system represented by the characteristic equations:	L3	7M

$$s^5 + 2s^5 + 8s^4 + 12s^3 + 20s^2 + 16s + 16 = 0.$$

OR

6. Sketch the root locus of a unity feedback system whose open loop transfer   L3   12M

function is given by $G(s)H(s) = \dfrac{K(s^2+6s+25)}{s(s+1)(s+2)}$ and also find the range of K

for the system to be stable.

UNIT-IV

7. Derive the expressions for resonant peak and resonant frequency and hence establish the correlation between time response and frequency response.   L3   12M

OR

8. Develop the Bode plot for the following Transfer Function   L3   12M

$G(s)H(s) = \dfrac{20(0.1s+1)}{s^2(0.2s+1)(0.02s+1)}$. From the bode plot determine (a)

Gain Margin (b) Phase Margin (c)Comment on the stability.

UNIT-V

9. a) Derive the expression for the transfer function from the state model.   L1   5M

$$X = Ax + Bu \text{ and } y = Cx + Du$$

b) Obtain the STM for the state model whose matrix A is given by   L4   6M

$$A = \begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix}.$$

OR

10	a)	What is state transition matrix and write its properties.	L2	4M
	b)	Diagnalize the following system matrix $A = \begin{bmatrix} 0 & 1 & 0 \\ 3 & 0 & 2 \\ -12 & -7 & -6 \end{bmatrix}$ and also	L4	8M

determine its Characteristic equation.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B. Tech III Year I Semester Supplementary Examinations July-2022
CAD/CAM
(Mechanical Engineering)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1 a) Draw the product cycle and CAD/CAM product cycle with neat sketch.   L2   6M
   b) Explain the CAD Tools.   L2   6M

OR

2 a) Write short notes on Rotation about a Fixed Point, Reflections and Shears.   L2   6M
   b) Describe the Utilization in a Industrial Environment of CAD.   L3   6M

UNIT-II

3 Describe briefly the following methods of surface modeling with a few   L1   12M
   application examples. (a) B-spline surface. (b) Bezier surface.

OR

4 a) Write a short note on analytic representations.   L4   6M
   b) Compare 2-D and 3-D wire frame models.   L2   6M

UNIT-III

5 a) List out and explain about basic components of an NC system and CNC   L2   6M
       system.
   b) Briefly explain about NC Coordinate systems.   L2   6M

OR

6 a) State and draw a neat sketch of the cutter radius compensation.   L2   6M
   b) Write a short note on Manual part programming.   L2   6M

UNIT-IV

7 a) Determine briefly about production flow analysis (PFA) and Benefits of   L2   6M
       Group Technology.
   b) What is mean by Machine cell design and explain it?   L3   6M

OR

8 a) Write Short notes on manufacturing system.   L2   6M
   b) State and explain briefly about terminology in quality control.   L2   6M

UNIT-V

9 Enumerate the Retrieval type system with neat sketch and explain the   L2   12M
   Benefits of CAPP.

OR

10 a) Write advantage and dis advantage of computer aided processes planning.   L3   6M
    b) Define the shop floor control and write short notes on function of shop floor   L2   6M
       control.

Q.P. Code: 19CS0517   R19

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations July-2022
DATA WAREHOUSING AND DATA MINING
(CSE)

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

UNIT-I

1	a)	Define Data mining? Explain about data mining on what kind of data.	L1	6M
	b)	Compare Data Warehousing and Data Mining	L5	6M

OR

2	a)	Illustrate the concept of Data discretization.	L2	6M
	b)	Explain about Dimensionality reduction methods?	L2	6M

UNIT-II

3	Construct lattice of cuboids given 4 dimensions: time, location, product and supplies.	L6	12M

OR

4	Explain in brief about ROLAP, MOLAP and HOLAP servers.	L2	12M

UNIT-III

5	What are the Draw backs of Apriori Algorithm? Explain about FP Growth Concept in Detail?	L5	12M

OR

6	a)	Explain about Constraint based Association mining	L5	6M
	b)	Discuss about the criteria for classifying the frequent itemset.	L6	6M

UNIT-IV

7	Define Bayes theorem. Explain the Naïve Bayesian Classification with an exa	L1	12M

OR

8	a)	Explain about Bayesian belief networks with an example	L5	6M
	b)	Summarize about attribute selection measures.	L2	6M

UNIT-V

9	What are the basic approaches for generating an agglomerative hierarchical clustering? Explain the algorithm.	L1	12M

OR

10	a)	Explain k-Means and k-Medoids partitioning methods in detail.	L5	6M
	b)	Discuss the key issues in hierarchical clustering algorithm.	L6	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations July-2022
TRANSPORTATION ENGINEERING
(CIVIL ENGINEERING)

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

UNIT-I

1   The speeds of overtaking and overtaken vehicles are 80 kmph and 60 kmph   L2   12M
    respectively on a two-way traffic road. If the acceleration of the overtaking
    vehicle is 0.80 m /s², calculate the safe overtaking sight distance. Sketch of the
    overtaking zone with location of sign posts.

OR

2   A valley curve is formed by a descending gradient of 1 in 40 meeting with an   L3   12M
    ascending gradient of 1 in 30. Design the length of valley curve for a design
    speed of 100 kmph so as to fulfill both comfort conditions and head light sight
    distance requirements. Assume rate of change of change of centrifugal
    acceleration as 0.6 m/sec3 , reaction time 2.5 sec and coefficient of friction 0.35

UNIT-II

3   What are the objectives of Traffic Volume studies? What are the methods of   L1   12M
    presentation of Volume Data?

OR

4   Explain the significance of traffic studies. Briefly explain any four types of traffic   L1   12M
    Studies

UNIT-III

5   Draw a sketch of flexible pavement cross section and show the component   L2   12M
    parts. Enumerate the Functions and importance of each component of the
    pavement

OR

6   A cement concrete pavement has a thickness of 26 cm and lane width of 3.5 m.   L3   12M
    Design the tie bars Along the longitudinal joints using the data given below:
    Allowable working stress in steel tie bars, Ss = 1250 kg/cm² Unit weight of CC,
    W = 2400 kg/cm3 Maximum value of friction coefficient, f = 1.2 Allowable tensile
    stress in deformed tie bar, Ss = 2000 kg/cm2 Allowable bond stress in deformed
    bars, Sb = 24.6 kg/cm².

UNIT-IV

7   a) Discuss briefly about the functions of different components of permanent way.   L2   6M
    b) What are the advantages and disadvantages of concrete sleepers   L1   6M

OR

8   a) Define creep in the rails. Explain various causes of creep.   L2   6M
    b) What are the requirements of good ballast   L1   6M

UNIT-V

9   a) Compute the maximum permissible speed for the following data on a curve of   L3   6M
        high speed B.G for the following data. Degree of curve = 1.20, Amount of super
        elevation = 8 cm, Length of transition curve = 150 m, Maximum sanctioned
        speed likely to be 135 kmph.
    b) What is grade compensation in railway track design? Why is it necessary to   L1   6M
        provide grade compensation?

OR

10 a) Discuss briefly the purpose for which railway stations are provided   L2   6M
    b) Discuss briefly about various components of turnouts.   L2   6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations July-2022
ELECTRICAL MEASUREMENTS
(EEE)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

1 a) Explain the construction and working of permanent magnet moving coil instruments.   L1   6M

   b) A moving coil instrument gives a full -scale deflection of 10mA when the potential across its terminals is 100mV. Calculate shunt resistance for a full - scale deflection corresponding to 100 A.   L3   6M

OR

2 a) Derive an expression for the Deflecting torque in MI type instruments   L3   6M

   b) List the advantages & disadvantages of MI type instruments   L1   6M

UNIT-II

3 a) Draw the circuit of a Kelvin's double bridge used for measurement of low resistances. Derive the condition for balance.   L4   6M

   b) Explain classification of resistances.   L2   6M

OR

4 Explain how Wien's bridge can be used for experimental determination of frequency. Derive the expression for frequency in terms of bridge parameters.   L2, L4   12M

UNIT-III

5 a) A single phase kilo watt hour meter makes 500 revolutions per kilo watt hour. It is found on testing as making 40 revolutions in 58.1 seconds at 5KW full load. Find the percentage error   L4   6M

   b) Derive the torque equation for electro dynamo meter type wattmeter.   L4   6M

OR

6 . Explain with a neat sketch the construction and working of a single-phase Dynamometer type Wattmeter.   L2   12M

UNIT-IV

7 a) What are the parameters to be considered in selecting a transducer for a particular application?   L1   6M

   b) Describe the working principle of thermocouples   L2   6M

OR

8 a) what is a transducer? Explain classification of transducers   L1   6M

   b) Describe the principle and operation of capacitive transducer for angular displacement measurement   L1   6M

UNIT-V

9 Describe briefly how the following measurements can be made with the use of CRO (i) Frequency. (ii) Phase angle. (iii) voltage.   L2   12M

OR

10 a) How do you measure leakage factor using Flux meter.   L1   6M

   b) compare flux meter and Ballistic Galvanometer   L2   6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations July-2022
ELECTRONIC MEASUREMENTS AND INSTRUMENTATION
(ELECTRONICS & COMMUNICATION ENGINEERING)
Time: 3 Hours   Max. Marks: 60
Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

1 a) Explain different types of errors that occur in measurements   L2 6M
  b) Derive the Series Type Ohm meter and explain its functionality   L3 6M

OR

2 a) Explain about Differential type voltmeter   L2 6M
  b) An Ammeter reads 8.3A and the true value of the current is 8.5A. L3 6M
     Determine The absolute error and Relative Percentage Error?

UNIT-II

3 a) Discuss various important features of CRT   L2 6M
  b) Explain the dual beam oscilloscope with a neat block diagram   L2 6M

OR

4 a) Explain various types of CRO probes   L2 6M
  b) How the frequency can be measured using a Lissajous method. Explain L1 6M
     with diagrams

UNIT-III

5 a) Draw the circuit diagram of a spectrum analyzer, and explain its working L2 6M
     strategy
  b) List the application of wave analyzers   L1 6M

OR

6 a) Draw the block diagram of a function generator and explain its operation   L3 6M
  b) With the help of a neat sketch, explain the working of any one of wave   L2 6M
     analyzer

UNIT-IV

7 a) List the applications and limitations of a Wheatstone bridge   L1 6M
  b) Derive the expression for Wein Bridge   L3 6M

OR

8 a) Label the functionality of a bridge. Derive & explain the Anderson's bridge L4 6M
     with a neat sketch
  b) Describe the operation of the Wheatstone bridge and derive the expression L2 6M
     for DC resistance

UNIT-V

9 a) Describe the operation of i) Resistive transducers ii) Capacitive transducers L2 6M
     and iii) Inductive transducers
  b) Explain any one of transducer to measure the displacement   L3 6M

OR

10 a) Explain the operation of thermocouples and thermistors   L3 6M
   b) Draw the diagram of Resistance Thermometer &explain briefly   L2 6M

Q.P. Code: 19ME0314

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

THERMAL ENGINEERING
(MECHANICAL)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1. a) Construct the expression for work done single stroke single acting reciprocating compressor — L3 — 6M

   b) A single stage reciprocating air compressor is required to compressor 1 kg of air from 1 bar to 4 bars. The initial temperate is 27ºC. Compare the work requirement in the following cases — L3 — 6M
      i)   Isothermal Compression
      ii)   Polytropic Compression with $PV^{1.2}=C$
      iii) Isentropic ompression

OR

2. a) Derive the relation for Volumetric efficiency of a single stage reciprocating compressor. — L3 — 6M

   b) Explain the working of Axial Flow compressor with neat sketch — L2 — 6M

UNIT-II

3. a) What are essential components of a simple open cycle gas turbine Plant? — L1 — 6M

   b) A gas turbine unit receives air at 100 kPa and 300 K and compresses it adiabatically to 620 kPa with efficiency of the compressor 88%. The fuel has a heating value of 44180KJ/Kg and the Fuel/air ratio is 0.017 kg fuel /kg air. The turbine internal efficiency is 90%. Calculate the Compressor work, turbine work and thermal efficiency. Take Cp= 1.005KJ/Kg.K. — L3 — 6M

OR

4. a) A gas turbine consists of a two stage compressor with perfect intercooler and a single stage turbine. If the plant works between the temperature limits of 300K and 1000K and 1 bar and 16 bar : find the net power of the plant per kg of air. Take specific heat at const. pressure as 1 KJ/Kg K — L3 — 6M

   b) List out the differences between the open cycle gas turbines and closed cycle gas turbines — L2 — 6M

UNIT-III

5. a) Explain various types of nozzles with neat sketches — L2 — 4M

   b) Derive an expression for maximum discharge through convergent divergent nozzle for steam — L3 — 8M

OR

6. a) Steam at it pressure of 6.3 bar and 200ºC is expanded in a nozzle to a pressure 010.2 bar. Find the final velocity and dryness fraction of steam, if (a) Friction is neglected and (b) 10% of the heat drop is lost in friction. — L3 — 8M

   b) What are the effects of super saturation on discharge and heat drop? — L1 — 4M

UNIT-IV

7. a) Show the velocity triangle diagram of impulse turbine. — L2 — 6M

   b) Explain the working process of reaction turbine. — L2 — 6M

Q.P. Code: 19ME0314

OR

8. a) List out the various losses in steam turbines? Explain them Briefly — L2 — 6M

   b) What are the advantages of steam turbine over steam engine? — L2 — 6M

UNIT-V

9. a) i) With a neat sketch explain any three parts in Internal Combustion engine — L2 — 6M
      ii) Explain any three classifications of I C Engine

   b) Show the theoretical and actual valve-timing diagram for Diesel engine — L2 — 6M

OR

10. a) A single cylinder, four stroke cycle oil engine is fitted with a rope brake. The diameter of the brake wheel is 600 mm and the rope diameter is 26 mm. The dead load on the brake is 200 N and the spring balance reads 30 N. If the engine runs at 450 rpm, Discover the brake power of the engine? — L3 — 6M

    b) Give explanation about the Working Principle of 2-Stroke SI Engine — L2 — 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations July-2022
SOFTWARE ENGINEERING
(CSE)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

1. Define software and Describe the characteristics of software. L2 12M

OR

2. a) Define the term Software Engineering – A Layered Technology L1 04M
   b) List out general principles of software engineering. L4 08M

UNIT-II

3. What is Use-case? Why is it used? How does it help in analyzing the requirements? Explain with an example. L1 12M

OR

4. List number of problems encountered in Elicitation? Explain. L4 12M

UNIT-III

5. a) How to assess alternate Architectural design. L1 06M
   b) Identify Architectural patterns. L3 06M

OR

6. What is software architecture ? Describe in detail different types of software architectural styles with illustrations. L2 12M

UNIT-IV

7. Compare Content architecture and WebApp architecture. L3 12M

OR

8. Give detailed notes on WebApp Design Quality and their goals. L2 12M

UNIT-V

9. What is Testing? Explain a number of software testing strategies with neat sketch. L2 12M

OR

10. Explain about the importance of test strategies in conventional software. L5 12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations July-2022
ELECTRICAL MEASUREMENTS
(EEE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1 a) Explain the construction and working of permanent magnet moving coil   L1   6M
      instruments.
   b) A moving coil instrument gives a full -scale deflection of 10mA when the   L3   6M
      potential across its terminals is 100mV. Calculate shunt resistance for a full -
      scale deflection corresponding to 100 A.

OR

2 a) Derive an expression for the Deflecting torque in MI type instruments   L3   6M
   b) List the advantages & disadvantages of MI type instruments   L1   6M

UNIT-II

3 a) Draw the circuit of a Kelvin's double bridge used for measurement of low   L4   6M
      resistances. Derive the condition for balance.
   b) Explain classification of resistances.   L2   6M

OR

4   Explain how Wien's bridge can be used for experimental determination of   L2,   12M
      frequency. Derive the expression for frequency in terms of bridge   L4
      parameters.

UNIT-III

5 a) A single phase kilo watt hour meter makes 500 revolutions per kilo watt   L4   6M
      hour. It is found on testing as making 40 revolutions in 58.1 seconds at 5KW
      full load. Find the percentage error
   b) Derive the torque equation for electro dynamo meter type wattmeter.   L4   6M

OR

6   . Explain with a neat sketch the construction and working of a single-phase   L2   12M
      Dynamometer type Wattmeter.

UNIT-IV

7 a) What are the parameters to be considered in selecting a transducer for a   L1   6M
      particular application?
   b) Describe the working principle of thermocouples   L2   6M

OR

8 a) what is a transducer? Explain classification of transducers   L1   6M
   b) Describe the principle and operation of capacitive transducer for angular   L1   6M
      displacement measurement

UNIT-V

9   Describe briefly how the following measurements can be made with the use   L2   12M
      of CRO (i) Frequency. (ii) Phase angle. (iii) voltage.

OR

10 a) How do you measure leakage factor using Flux meter.   L1   6M
   b) compare flux meter and Ballistic Galvanometer   L2   6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations July/August 2022
ELEMENTS OF ROAD TRAFFIC SAFETY
(Common to ME, ECE & CSE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1   Give a detailed discussion about Accident situation in India with past   L2   12M
    accident data?

OR

2   Apply your knowledge as a graduate and how u suggests various   L3   12M
    measures to be considered in view of controlling the Road Accidents.

UNIT-II

3   Analyze various aspects which are indicated in regulation of vehicles   L4   12M

OR

4   Briefly explain the various traffic regulatory measures that should be   L2   12M
    considered for On-street Parking

UNIT-III

5   What do you know about Informatory signs and Route marker signs with   L3   12M
    neat sketch?

OR

6   Give a brief discussion about Location, Height & Maintenance of traffic   L4   12M
    signing.

UNIT-IV

7   How Amber period, Red/Amber period and Intergreen period is   L1   12M
    determined in various countries practices

OR

8   a) What do you meant by Area traffic control and give the objectives of it   L1   6M
    b) Give a brief discussion about Delay at signalized intersections   L2   6M

UNIT-V

9   What are the functions of road markings & List out all 14 various types of   L1   12M
    road markings?

OR

10 Briefly explain about various types of Lamps used in street lighting in view   L2   12M
    of road traffic safety at night time on roads

Q.P. Code: 19ME0321

R19

NON CONVENTIONAL ENERGY RESOURCES
(Common to CE, EEE & ECE)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

1 a) Define conventional and non-conventional Energy with Examples.   L1   6M
   b) How do you classify the energy sources and brief them.   L3   6M

OR

2 a) Illustrate the working processes of thermal power plant with a neat sketch.   L2   6M
   b) Describe briefly the working principles of Hydro Electric energy.   L2   6M

UNIT-II

3 a) List various the applications of solar PV cell.   L3   6M
   b) Illustrate the functions of various components in flat plate collectors and also explain the working principle of flat plate collector.   L2   6M

OR

4 a) Explain the working of Pyrheliometer with a neat sketch. Applications.   L3   6M
   b) Describe with a neat sketch working of a solar water heating system.   L2   6M

UNIT-III

5 a) Discuss the importance of measuring wind speed and name its measuring instruments.   L2   6M
   b) Describe the functions of components of wind energy systems.   L3   6M

OR

6 a) Differentiate between HAWT and VAWT.   L4   6M
   b) Discuss about Savonius wind turbine with neat sketch. Write applications.   L3   6M

UNIT-IV

7 a) What is biomass and why it is called as renewable energy?   L1   6M
   b) Name various strokers used for the combustion of biomass and explain anyone with a neat figure.   L3   6M

OR

8 a) What is meant by fermentation, aerobic, anaerobic digestion? Explain.   L1   6M
   b) Explicate various steps involved in the production of Ethanol.   L2   6M

UNIT-V

9 a) What is the geothermal energy? Explain its extraction process.   L3   6M
   b) Explain Geothermal binary cycle power plant with neat diagram.   L2   6M

OR

10 a) Explain the working of fuel cell and their applications   L2   6M
    b) What is tide? Explain the basic components of a tidal power plant and state their merits and demerits.   L3   6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester (R18) Supplementary Examinations July 2022
MANAGEMENT SCIENCE
(Common to CSE & ECE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

1.   Answer the following; (5 X 2 = 10 Marks)
    (a)   What is committee organization?   L1   2M
    (b)   Enumerate the ABC analysis.   L4   2M
    (c)   Discuss Placement and Employee Induction.   L2   2M
    (d)   What are the stages of strategy formulation and implementation?   L1   2M
    (e)   Briefly explain about MIS.   L2   2M

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

2.   a.   Nature and Importance of Management – Explain.   L2   5M
     b.   Mention the elements of Scientific Management   L3   5M

OR

3.   Define and explain in the management and its various functions.   L2   10M

UNIT – II

4.   Make a comparative analysis of the features of Different methods of   L4   10M
          production.

OR

5.   Explain the concept of work study and its types   L2   10M

UNIT – III

6.   Explain and evaluate the process of recruitment and employee selection   L5   10M

OR

7.   Briefly Discuss the methods of Performance Appraisal.   L2   10M

UNIT – IV

8.   Examine the concept of corporate planning. Discuss the essential steps in   L4   10M
          corporate planning through a flow chart.

OR

9.   Explain and illustrate what you understand by network analysis. How would   L4   10M
           you compare PERT with CPM?

UNIT – V

10.   Explain the enterprise resource planning and its utilities in management.   L5   10M

OR

11.   What is Bench Marking and how does an organization derive benefit from such   L4   10M
          initiatives?

Q.P. Code: 18CS0527   R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester (R18) Supplementary Examinations July-2022
MOBILE APPLICATION DEVELOPMENT
(CSE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

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

(a)	What is an Android?	I.1	2M
(b)	What is Layout?	L1	2M
(c)	What are the Views in Android?	L1	2M
(d)	What is SQLite database?	L1	2M
(e)	Recall the use of SMS?	L1	2M

Name the permissions you need to declare in your AndroidManifest.xml
file for sending and receiving SMS messages.

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

2.	(a)	How to create a First Android Project?	L1	5M
	(b)	Explain it by defining XML and Action code through Java with a neat example	L2	5M

OR

3.	Create simple registration form, pass and display those all entered data in another activity using intent.	L1	10M

UNIT – II

4.	(a)	How to create User Interface Programmatically.	L3	10M
	(b)	Develop relevant code for the above.		

OR

5.	(a)	Explain Event handing.	L3	10M
	(b)	Develop a program to display the Messages through Toast?		

UNIT – III

6.	Demonstrate Progress Bar control with an example program?	L5	10M

OR

7.	Explain Image Views to display pictures in Android Mobile.	L5	10M

UNIT – IV

8.	Develop an android application for login & registration using SQLite database connectivity.	L3	10M

OR

9.	(a)	Describe SQLite database?	L5	10M
	(b)	How to provide database connection using SQLite database.		

UNIT – V

10.	Create a Simple Own Service to start and stop the service in Android?	L3	10M

OR

11.	Express how to Publishing your application on the Android Market. Explain?	L4	10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester (R18) Supplementary Examinations July-2022
EMBEDDED SYSTEMS and IoT
(Electronics & Communication Engineering)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

1.   Answer the following; (5 X 2 = 10 Marks)
   (a) State any four important characteristics of embedded systems.   L1   2M
   (b) List out the interfaces used in IoT.   L1   2M
   (c) List out the communication protocols used for M2M local area networks. L1   2M
   (d) List out the statements used in Python.   L1   2M
   (e) What is the use of GPIO pins in a IoT device?   L1   2M

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

2. (a) Distinguish between RISC and CISC design.   L2   5M
    (b) List various applications of embedded systems.   L2   5M
                                    OR
3.   With a neat diagram, explain the design process of an embedded system. L1   10M

UNIT – II

4.   With the help of neat diagrams, describe the levels of IoT with an example. L2 10M
                                    OR
5. (a) With a neat sketch, explain the request-response communication model of IoT. L2 5M
    (b) Compare Transmission protocol and user datagram protocol with diagram. L4   5M

UNIT – III

6.   Describe how the environment can be more protected with the help of IoT L2   10M
         technology in the following categories:
         (i) Air pollution monitoring   (ii) Noise pollution monitoring
         (iii) Forest fire detection   (iv) River flood detection
                                    OR
7.   With the help of neat diagrams, explain the M2M system architecture.   L2   10M

UNIT – IV

8.   Explain the following data types of python with examples: L5   10M
         (i) Tuples   (ii) Dictionaries
                                    OR
9. (a) Describe the principles of Object-Oriented Programming.   L4   5M
    (b) Explain about the classes in Python with examples.   L4   5M

UNIT – V

10. (a) With the help of neat sketch explain the basic building blocks of IoT device. L3   6M
    (b) Justify how Raspberry Pi is different from a desktop computer.   L5   4M
                                    OR
11. (a) Design an automatic motion light system using Raspberry Pi and write a   L6   5M
         python program to support the working of that design.
    (b) Explain an IoT device & give some examples.   L2   5M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester (R18) Supplementary Examinations July-2022
AUTOMOBILE ENGINEERING
(Mechanical Engineering)

Time: 3 hours   Max.Marks: 60

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

1.
(a)	Define an Automobile.	L1	2M
(b)	Write the functions of Fuel supply system.	L1	2M
(c)	List out the types of Ignition system.	L1	2M
(d)	What are the main components of Transmission system?	L1	2M
(e)	Name the Types of Steering Mechanisms.	L1	2M

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

2. (a) List out the components of I.C engine and its function.   L1   5M
   (b) Show front and rear wheel drive layout in detail with relevant sketch.   L1   5M

OR

3. Explain the following four design variants available in Direct Injection type CI combustion chambers with neat sketches. i) Shallow depth chamber ii) Hemispherical chamber iii) Cylindrical chamber iv) Toroidal chamber.   L4   10M

UNIT – II

4. Explain the working of supercharger and turbo charger with a neat sketch.   L2   10M

OR

5. Explain the working of three-way catalytic converter with a neat sketch.   L3   10M

UNIT – III

6. Explain briefly about battery coil ignition system with a suitable sketch.   L4   10M

OR

7. (a) Explain the grading phenomena of Lubricant.   L4   5M
   (b) What is the solenoid switch in automobiles? state the necessity of it.   L5   5M

UNIT – IV

8. What are the different types gear boxes used in an automobile? Explain the synchromesh gear box with neat sketch.   L5   10M

OR

9. Sketch and discuss in detail about the torque converter.   L3   10M

UNIT – V

10. Explain with the help of a neat layout about Ackerman steering gear Mechanism.   L3   10M

OR

11. Answer all the following questions
Define ABS & Define EBS.
Discuss about Traction control.   L4   10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech IV Year I Semester (R18) Supplementary Examinations July-2022

POWER SYSTEM PROTECTION
(EEE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

Answer the following (5 X 2 = 10 Marks)

1.
(a)	What are the applications of SF6 circuit breaker?	L1	2M
(b)	Define relay. List out classification of relays.	L1	2M
(c)	How do you protect generator against stator faults?	L1	2M
(d)	What is the commonly used protection for 3 phase feeders?	L1	2M
(e)	Why is earth wire provided in overhead transmission lines?	L1	2M

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

UNIT – I

2.
(a)	Explain the principle of ARC extinction.	L2	5M
(b)	Illustrate the concept of current chopping.	L2	5M

OR

3. Explain Sliepian's theory and energy balance theory — L2 10M

UNIT – II

4. Explain working of microprocessor based over current relay with suitable diagram. — L2 10M

OR

5. Describe the principle of Impedance relay and explain its characteristics on R-X-planes. — L3 10M

UNIT – III

6.
(a)	Calculate the required value of neutral resistance for a 3-phase11kv alternator to protect 70% of the winding against earth-fault by a relay with pick-up current of 1 A. The neutral CT has a ratio of 250/5.	L3	5M
(b)	Explain protection of generators in abnormal conditions	L2	5M

OR

7.
(a)	An 11kv,1000 MVA generator is provided with differential scheme of protection. The percentage of generator winding to be protected against phase to ground fault is 80%, the relay is set to be operate when there is a 15% out of balance current determine the value of resistance to be placed in neutral to ground connection?	L3	5M
(b)	Describe the protection of the stator windings of 3-phase alternator against turn-to-turn faults.	L2	5M

UNIT – IV

8.
(a)	What is the importance of bus-bar protection? What are the requirements of protection of lines?	L2	5M
(b)	Explain in detail about the Merz price voltage balanced system with a neat single line diagram.	L2	5M

OR

9.
(a)	Explain about the over current protection of bus bars with relevant connection diagram	L2	5M
(b)	Draw the schematic diagram of the carrier current protection scheme of lines. Also explain its working principle.	L2	5M

UNIT – V

10.
(a)	Discuss the phenomena of a lightning stroke.	L2	5M
(b)	Write a short note on causes of over voltages in power systems.	L2	5M

OR

11.
(a)	What is horn gap arrester? Explain its working. Discuss the purpose of inserting a resistance.	L2	5M
(b)	Discuss the advantages and disadvantages of overhead ground wires	L2	5M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester (R18) Supplementary Examinations July-2022
ARTIFICIAL INTELLIGENCE & MACHINE LEARNING
(CSE)

Time: 3 hours

Max.Marks: 60

PART-A
(Compulsory Questions)

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

(a)	List out the Role of Intelligent Agents.	L1	2M
(b)	What is GGP?	L2	2M
(c)	Write the difference between Supervised and Unsupervised learning.	L2	2M
(d)	Define the term . Data visualization.	L1	2M
(e)	What is generalisation.	L2	2M

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

2.	Describe the problem solving techniques to Typical AI problems.	L2	5M
	Explain about a typical agent system.	L2	5M

OR

3.	Explain how a Tree , B-Tree and AI algorithms solves a problem.	L1	10M

UNIT – II

4.	Elaborate the role of Activation function.	L4	10M

OR

5.	Describe how backtracking search is used to solve a problem.	L2	10M

UNIT – III

6.	write in detail about Multilayer perceptron.	L3	10M

OR

7.	How will you train a data in feed forward neural network.	L4	10M

UNIT – IV

8.	Explain with suitable example for LDA.	L3	10M

OR

9.	With example explain patterns in heterogeneous cross-sectional data.	L3	10M

UNIT – V

10.	With example explain the non-parametric density estimation.	L3	10M

OR

11.	Elaborate the condensed nearest neighbour method.	L4	10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester (R18) Supplementary Examinations July-2022
VLSI DESIGN
(ECE)

Max.Marks: 60

Time: 3 hours

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

1.			
(a)	Define Transconductance and Output Conductance	L1	2M
(b)	Illustrate nMOS transistor in λ-based design rule	L1	2M
(c)	Define Routing in the geometrical layouts	L1	2M
(d)	Define Parity generator logic circuits	L1	2M
(e)	Differentiate FPGA and CPLD	L1	2M

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

2.	Illustrate the steps involved in nMOS fabrication process with neat sketches	L2	10M

OR

3.	Determine the relationship between I_{ds} & V_{ds} in non-saturated and saturated region.	L2	10M

UNIT – II

4.	a)	Construct the stick diagram for 2-input CMOS XOR gate	L3	5M
	b)	Illustrate λ-design rules for contact cuts	L2	5M

OR

5.	a)	Sketch the layout diagram for 2-input CMOS NAND gate	L3	5M
	b)	Explain about Stick diagram with one example	L2	5M

UNIT – III

6.	Explain the following with an example (i) Domino CMOS logic. (ii) NORA logic.	L2	10M

OR

7.	Explain the following terms (i) Floor planning (ii) Placement (iii) Routing	L2	10M

UNIT – IV

8.	a)	Construct and explain the circuit diagram of 3-bit LFSR with example	L3	5M
	b)	Construct and explain the Johnson counter	L3	5M

OR

9.	Design an Arithmetic and Logic Unit circuit with four functions using multiplexers and explain its operation.	L6	10M

UNIT – V

10.	Define BILBO? Draw the logic diagram of BILBO & explain its operation in different modes?	L2	10M

OR

11.	a)	Explain in detail about standard cell design with suitable diagrams.	L3	5M
	b)	Give a logic circuit example in which stuck-at-1 fault and stuck-at-0 fault are indistinguishable	L2	5M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester (R18) Supplementary Examinations July-2022
REFRIGERATION AND AIR CONDITIONING
(MECH)

Time: 3 hours   Max.Marks: 60

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

1.
(a) What is the relation between COP of a Heat pump and a Refrigerator?   L1 2M
(b) What is the use of a flash chamber in vapour compression refrigeration system?   L1 2M
(c) What are secondary refrigerants? Give an example.   L1 2M
(d) What is Dew point temperature   L1 2M
(e) List out the methods used to design an air-conditioning duct.   L1 2M

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

2. (a) State the applications of air refrigeration system.   L1 4M
(b) Describe Boot strap air refrigeration system, with a schematic diagram and show the cycle on T-S Diagram.   L1 6M

OR

3. Derive the COP of Bell-Coleman cycle with the help of P-V and T-S diagrams   L4 10M

UNIT – II

4. (a) What are the desirable properties of refrigerants?   L1 5M
(b) Differentiate between primary and secondary refrigerants.   L1 5M

OR

5. A refrigeration machine using R-12 as refrigerant operates between the pressures 2.5 bar and 9 bar. The compression is isentropic and there is no undercooling in the condenser. The vapour is in dry saturated condition at the beginning of the compression. Estimate theoretical C.O.P. If the actual C.O.P. is 0.65 of theoretical value, calculate the net cooling produced per hour. The refrigerant flow is 5 kg/min. Properties of refrigerant are :   L3 10M

Pressure (bar)	Temp (°C)	Enthalpy (kJ / kg) Liquid	Vapour	Entropy of saturated vapour (kJ / kg- K)
9	36	70.55	201.8	0.6836
2.5	-7	29.62	184.5	0.7001

UNIT – III

6. (a) Differentiate between primary and secondary refrigerants.   L2 6M
(b) Discuss the principle of thermo-electric refrigeration system.   L2 4M

OR

7. Explain the working of Vortex tube refrigeration system with a neat sketch. List its merits and demerits   L1 10M

UNIT – IV

8. (a) Define humidity ratio, relative humidity and degree of saturation   L1 6M
(b) Explain the procedure to drawing a grand sensible heat factor line on a psychrometric chart   L5 4M

OR

9. A room 7m × 4m× 4m is occupied by an air-water vapour mixture at 38°C. The atmospheric pressure is 1 bar and the relative humidity is 70%. Determine the humidity ratio, dew point, mass of dry air and mass of water vapour. If the mixture of air-water vapour is further cooled at constant pressure until the temperature is 10°C. Find the amount of water vapour condensed   L5 10M

UNIT – V

10. An air conditioning plant is required to supply 60 m³ of air per minute at a DBT of 21°C and 55 % RH. The outside air is at DBT of 28 °C and 60 % RH. Determine the mass of water drained and then to cool the cooling coil. Assume the air conditioning plant first to dehumidify and then to cool the air. Take w_1=0.0142, w_2=0.0084 kg /kg of dry air, v_2=0.845 m³ / kg, h_1=64.8 kJ/kg, h_2=42.4 kJ/kg.   L5 10M

OR

11. (a) Explain the working of year round air conditioning system with a sketch   L4 5M
(b) Explain the working of a domestic refrigerator with a neat sketch   L4 5M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester (R18) Supplementary Examinations July-2022
POWER QUALITY
(EEE)

Time: 3 hours　　　　　　　　　　　　　　　　　　　　　　　Max.Marks: 60

PART-A
(Compulsory Questions)

1.　　　　　　　　　Answer the following; (5 X 2 = 10 Marks)
　　(a)　Define coupling　　　　　　　　　　　　　　　　　　　　　　L1　2M
　　(b)　What is the frequency range and duration in medium frequency transient?　L1　2M
　　(c)　What is ment by TDD?　　　　　　　　　　　　　　　　　　L1　2M
　　(d)　Why the flicker meter is need?　　　　　　　　　　　　　　　L1　2M
　　(e)　What is Static Current Limiter?　　　　　　　　　　　　　　　L1　2M

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

2.　(a)　What are the types of wave form distortion?　　　　　　　　　L1　5M
　　(b)　Write a short note on voltage imbalance　　　　　　　　　　L2　5M

OR

3.　　Draw and explain the CBEMA curve　　　　　　　　　　　　L1　10M

UNIT - II

4.　　Mention the categories and characteristics of electromagnetic phenomena in　L3　10M
　　power systems?

OR

5.　　Classify the principles of regulating the voltage　　　　　　　　L2　10M

UNIT - III

6.　　Explain the brief description about the harmonic distortion evaluation　L2　10M

OR

7.　　What are the harmonics sources from commercial loads?　　　　　L1　10M

UNIT - IV

8.　　Explain about the power quality bench marking.　　　　　　　　L1　10M

OR

9.　　Explain the categories of instruments to consider for harmonic analysis　L1　10M

UNIT - V

10.　　Draw and explain the schematic diagram of a right shunt UPQC?　　L3　10M

OR

11.　　Draw and explain the schematic diagram Dynamic Voltage Restorer?　L3　10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester (R18) Supplementary Examinations July-2022
BIG DATA ANALYTICS
(CSE)

Max.Marks: 60

Time: 3 hours

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

1.
(a)	Summarize the data types for Big data	L2	2M
(b)	Distinguish between horizontal file format and vertical File format	L2	2M
(c)	What is Shuffling in MapReduce?.	L3	2M
(d)	Compare any two execution modes of pig.	L2	2M
(e)	Critique about the advantages of Hive query language	L5	2M

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

2. (a) Examine the different types of digital data with examples?   L4   5M
 (b) Discuss Big Data in terms of three dimensions, volume, variety and velocity.   L2   5M

OR

3. (a) Discriminate the Big Data in Healthcare,Trasportation & Medicine.   L5   5M
 (b) Why business are using big data for competitive advantage?   L4   5M

UNIT – II

4. Determine the basic commands in Hadoop command line interface.   L3   10M

OR

5. (a) Discuss about the data ingest operation using sqoop and flume   L1   5M
 (b) Differentiate the compression and serialization operation in Hadoop I/O.   L2   5M

UNIT - III

6. (a) Examine the different types of Job Scheduling process in Map Reduce.   L3   5M
 (b) Describe the Default MapReduce Job.   L3   5M

OR

7. Categorize the different types of input formats in MapReduce.   L4   10M

UNIT - IV

8. (a) Compare the PIG with Databases with an Example   L5   5M
 (b) Evaluate the Expressions and types in Pig Latin.   L4   5M

OR

9. (a) Discriminate the Structures, Statements in Pig Latin   L4   5M
 (b) Evaluate Data Processing Operators in Pig Latin.   L5   5M

UNIT - V

10. (a) Deduce the various services offered by Hive.   L4   5M
 (b) Examine the Characteristics of HBase   L4   5M

OR

11. Explain with a neat diagram the architecture of Hbase.   L2   10M

Q.P. Code: 18EC0434

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester (R18) Supplementary Examinations July 2022
DIGITAL IMAGE PROCESSING
(ECE)

Time: 3 hours

Max.Marks: 60

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

1.
(a) Recall the neighbors of a pixel using suitable representation.   L1   2M
(b) What is the main difference between DCT and DFT ?   L1   2M
(c) Compare Pseudo color image processing and full color image processing. L1   2M
(d) What are the advantages of a Wiener filter over an inverse filter?   L1   2M
(e) Define compression ratio.   L1   2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT – I
2. (a) Summarize the concepts of image modeling with relevant expressions.   L1   5M
   (b) Explain the various types of digital image representations with examples   L2   5M

OR

3. Explain the important terms related to Imaging Geometry with suitable   L1   10M
expressions.

UNIT - II
4. Apply 2D – Discrete Fourier Transform for the following image   L3   10M

$$f(m,n) = \begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \end{bmatrix}$$

OR

5. Explain in brief about Hoteling Transform

L3   10M

UNIT - III
6. Explain the histogram equalization operation in image enhancement with   L5   10M
necessary expressions.

OR

7. Interpret the C.I.E. Color Space and mention its significance.

L5   10M

UNIT - IV
8. Discuss the algebraic approach of constrained Least Square filter restoration.   L3   10M

OR

9. Explain the procedure for image segmentation based on
(i)Region growing   (ii) region splitting & merging   L5   10M

UNIT - V
10. Explain the following
(i) Fast Wavelet Transforms   (ii) Wavelet packets   L3   10M

OR

11. Derive the Code word, Average Length (L), Entropy (H(s)), Efficiency of the   L4   10M
word "COMMITTEE" using binary Huffman coding.

R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester (R18) Supplementary Examinations July-2022
MECHATRONICS & ROBOTICS
(MECH)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)
1.   Answer the following; (5 X 2 = 10 Marks)
   (a) What is sensor and transducer?   L1   2M
   (b) List any two applications of hydraulic and pneumatic system.   L1   2M
   (c) List out the types of grippers.   L1   2M
   (d) What is path planning?   L1   2M
   (e) What is robot program language?   L1   2M

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

2. a) Define Mechatronics with elaborate definition. And give examples of   L1   5M
      mechatronics system.
   b) Explain the various components in mechatronics system with neat sketch.   L2   5M

OR

3.   Illustrate the various static characteristics of sensors. What is the function of   L1   10M
      sensor? How do you classify the sensors?

UNIT – II

4.   Define actuator. Actuators plays a primary role in mechatronics system   L3   10M
      explains it.

OR

5.   Describe the basic components of both pneumatic system and hydraulic with   L3   10M
      neat diagram.

UNIT – III

6.   How does micro controller work? What are the elements of a microcontroller   L5   10M

OR

7.   List the different types of joints used in robots with neat sketch. Also make a   L5   10M
      note on FLD (Function Line Diagram)

UNIT – IV

8.   Define robot. With neat sketch explain the robot anatomy.   L3   10M

OR

9.   Clearly explain with neat sketches the manipulator kinematics   L5   10M

UNIT – V

10.   Write an elaborate note on motion commands of robots   L3   10M

OR

11.   Elucidate various software packages in robot application in detail.   L4   10M

Q.P. Code: 18EE0230   R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester (R18) Supplementary Examinations July-2022
HVDC AND FACTS
(EEE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)
1.   Answer the following; (5 X 2 = 10 Marks)
    (a) List the disadvantages of AC Transmission over long   L1   2M
    (b) Explain the generation of harmonics in HVDC system?   L1   2M
    (c) What are the factors which limit the loading capabilities of transmission line   L1   2M
         explain?
    (d) Define various limits which define the capability TCSC.   L1   2M
    (e) What is the need of UPFC?   L1   2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT – I
2. (a) Explain the analysis of 6 pulse converter with and without overlap.   L2   5M
    (b) Explain the different converter configuration commonly employed for   L2   5M
         HVDC converter and bring out their merits and de-merits.
                                    OR
3.   Explain clearly about Typical Layout of Converter Station and their   L2   10M
         functions with neat sketch.
UNIT – II
4.   Illustrate the role of smoothing reactor in a DC link   L3   10M
                                    OR
5.   Draw the Equivalent Circuit of bipolar DC Link.   L3   10M
UNIT – III
6.   Recommend FACTS devices in reactive power compensation and to Reduce   L5   10M
         Losses.
                                    OR
7.   Classify the types of FACTS devices and explain in detail.   L5   10M
UNIT – IV
8.   Draw the basic circuit of STATCOM.   L3   10M
                                    OR
9.   Compare and contrast STATCOM and SVC.   L2   10M
UNIT – V
10.   Illustrate the salient features of UPFC   L3   10M
                                    OR
11.   Explain the power flow control and oscillation damping in the two area   L4   10M
         system using UPFC

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester (R18) Supplementary Examinations July-2022
DATA SCIENCE
(CSE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

1.   Answer the following; (5 X 2 = 10 Marks)
   (a) What is exploratory analysis?   L1   2M
   (b) Define Hypothesis Testing   L1   2M
   (c) Relate Ridge regression and Lasso regression   L1   2M
   (d) State the advantage of using PAM.   L1   2M
   (e) What is text analytics?   L1   2M

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

2. a) Expand and Distinguish between NOIR attributes   L1   5M
    b) Describe the Array function in R   L2   5M

OR

3.   Examine the functions used for Visualizing a Single Variable L1   10M

UNIT – II

4.   Suppose everyone who visits a retail website gets one promotional offer or no   L3   10M
     promotion at all. We want to see if making a promotional offer makes a
     difference. What statistical method would you recommend for this analysis?

OR

5.   State and Explain Apriori Algorithm with an example.   L3   10M

UNIT – III

6.   Justify the usage of Linear and Logistic regression and Illustrate the Logistic   L5   10M
     regression model.

OR

7.   Consider the given confusion Matrix of Naïve Bayes from the Bank Marketing   L5   10M
     Dataset

		Predicted Class		
		Subscribed	Not Subscribed	Total
	Subscribed	3	8	11
Actual Class	Not Subscribed	2	87	89
Total		5	95	100

Calculate the following Performance metrics.
a) Accuracy b) TPR c) FPR d) FNR e) Precision

UNIT – IV

8.   Illustrate the method to find k clusters from a collection of M objects with n   L3   10M
     attributes

OR

9.   Correlate ARMA and ARIMA Models   L5   10M

UNIT – V

10. Explain the three important steps of the text analysis   L3   10M

OR

11. What is meant by sentiment analysis and illustrate the methods used for   L4   10M
     sentiment analysis

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester (R18) Supplementary Examinations July-2022
FIBER OPTIC COMMUNICATIONS
(ECE)

Time: 3 hours

Max.Marks: 60

PART-A
(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)
   (a) Write about the Snell's law   L1   2M
   (b) Define Information Capacity   L1   2M
   (c) Sketch the Emitter LED circuit.   L1   2M
   (d) Sketch the schematic representation of a PIN photodiode circuit   L1   2M
   (e) List the differences between the optical multiplexing and de-multiplexing   L1   2M
       techniques.

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

2. Explain the Elements of Optical Communication System with neat sketch.   L1   10M
   ### OR
3. (a) Compare step index & graded index fiber.   L2   5M
   (b) Describe the multimode Graded Index fiber with neat sketch.   L1   5M

UNIT – II

4. Demonstrate any two types of Losses in Optical Fiber Communication   L2   10M
   System.

   ### OR
5. (a) Compute the expression for total dispersion in single mode fiber   L3   5M
   (b) Explain the refractive index profile optimizes the design in a single mode   L2   5M
       fiber?

UNIT – III

6. (a) Explain in detail the various Characteristics of Light Source   L2   5M
   (b) Describe about Temperature effects of Laser   L1   5M
   ### OR
7. (a) Explain about quantum efficiency and LED power.   L2   5M
   (b) Demonstrate on direct and indirect bandgap materials in detail.   L2   5M

UNIT – IV

8. (a) Explain about avalanche multiplication noise in APD diode.   L2   5M
   (b) Compare various photo detectors.   L2   5M
   ### OR
9. (a) Explain about the probability of error in detail.   L2   5M
   (b) Explain the working principle of depletion layer photocurrent with diagram.   L2   5M

UNIT – V

10. Explain optical amplifier and its applications.   L2   10M
    ### OR
11. (a) Describe the bandwidth budget.   L2   6M
    (b) Describe about power budget with examples   L2   4M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester (R18) Supplementary Examinations July-2022
MODERN MACHINING METHODS
(MECH)

Time: 3 hours

Max.Marks: 60

PART-A
(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)
    (a) Write down any two applications of AJM Machining. L2 2M
    (b) List the advantages of EDG Process. L2 2M
    (c) What are the important requirements of Chemical machining Process? L1 2M
    (d) Define the Principle of Laser Beam Machining (LBM). L1 2M
    (e) Define Nano machining. L1 2M

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

2. (a) Explain the basic differences Between Traditional And Non- Traditional Manufacturing Processes are used. L2 5M
    (b) What are the advantages and disadvantages of water jet machining (WJM)? L1 5M

OR

3. What are the applications, advantages and disadvantages of Abrasive Jet Machining (AJM)? L1 10M

UNIT – II

4. Explain the working principle, machining process of EDM (Electrical Discharge machining) with neat sketch. L2 10M

OR

5. Give a brief note on advantages and limitations of Electrical Discharge Grinding (EDG) process. L4 10M

UNIT – III

6. Explain the working principle of Electro Chemical Grinding (ECG) process with a schematic diagram and specify the parameters. L5 10M

OR

7. Write the advantages, disadvantages and applications of Electro Chemical Honing (ECH). L2 10M

UNIT – IV

8. Write the advantages, disadvantages Laser Beam Machining (LBM). L3 10M

OR

9. Draw the schematic layout of Plasma Arc Machining (PAM) set up and explain the major elements in it. L5 10M

UNIT – V

10. Classify the Conventional Micro machining Processes and Non-Conventional Micro machining Processes. L3 10M

OR

11. Explain about the Micro-Nano Fabrication Techniques. L2 10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester (R18) Supplementary Examinations July-2022
ENTREPRENEURSHIP DEVELOPMENT
(Common to ECE, CSE, CIVIL & MECH)

Time: 3 hours

Max.Marks: 60

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

1.
   (a) Who is Entrepreneur   L1   2M
   (b) Define MSME   L2   2M
   (c) What is intellectual Property   L1   2M
   (d) Letter of credit   L1   2M
   (e) Project appraisal   L3   2M

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

2.   Explain Functions of Entrepreneurship   L1   10M
OR
3.   Give brief explanation about Rural and Urban Entrepreneurship   L2   10M
UNIT – II
4.   How are MSMEs helpful to develop Economic Development   L3   10M
OR
5.   List out the advantages and disadvantages of Partnership business   L3   10M
UNIT – III
6.   Develop the consequence of Invention in Entrepreneurship   L5   10M
OR
7.   Explain intellectual property and its importance?   L2   10M
UNIT – IV
8.   Entrepreneurship development program is the process of grooming   L4   10M
    entrepreneurs – Elucidate.
OR
9.   How entrepreneurship development programs are helpful to an entrepreneur   L5   10M
    explain?
UNIT – V
10. Explain the steps involved in the preparation of project feasibility report   L2   10M
OR
11. How does Project management help the entrepreneur in entrepreneurship?   L4   10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester (R18) Supplementary Examinations July-2022
SOFTWARE DEVELOPMENT & TESTING
(Common to ECE, EEE & MECH)

Time: 3 hours   Max.Marks: 60

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

(a)	Explain the software engineering layers.	L1	2M
(b)	Discuss three types of requirements.	L1	2M
(c)	What are the three golden rules in interface design?	L1	2M
(d)	Define white box testing?	L1	2M
(e)	Compare between test plan and test design?	L1	2M

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

2.	a	How Framework activities help to solve a problem?	L2	5M
	b	Discuss about Extreme Programming (XP)?	L2	5M
		OR		
3.	a	Discuss in brief about Unified Process Model with neat diagram.	L1	5M
	b	Explain in detail about incremental model?	L2	5M

UNIT – II

4.	a	List various analysis rules of thumb in requirement analysis?	L3	5M
	b	Describe Quality attributes of Design Process?	L2	5M
		OR		
5.	a	Justify the Concept of Design process.	L3	5M
	b	What is software Architecture? Mention what are the Architectural patterns.	L1	5M

UNIT – III

6.	a	Discuss user interface analysis	L2	5M
	b	Manipulate various steps of Interface Design.vvv	L3	5M
		OR		
7.	a	Define web app, and discuss about web app design.	L1	5M
	b	Describe the steps involved in Web App Interface Design.	L6	5M

UNIT – IV

8.	a	Explain about the importance of test strategies in conventional software?	L3	5M
	b	Discuss the process of art of debugging?	L3	5M
		OR		
9.	a	Discuss about levels of software testing?	L5	5M
	b	Discuss Alpha and Beta testing?	L2	5M

UNIT – V

10.	a	Explain advantages and disadvantages of software quality assurance?	L3	5M
	b	How to specify the test cases?	L2	5M
		OR		
11.	a	List out the testing principles in software?	L4	5M
	b	Elaborate test case design techniques?	L3	5M