Q.P. Code: 18HS0830

R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B. Tech I Year I Semester Supplementary Examinations May 2023
MATHEMATICS – I
(Common to ALL)

Time: 3 Hours

Max. Marks: 60

PART-A
(Compulsory Questions)

(5 X 2 = 10 Marks)

1. Answer the following questions.

(a)	Define symmetric and skew symmetric matrices	L1 2M
(b)	State Rolle's theorem	L2 2M
(c)	Compute the stationary points of the function $f(x,y) = x^3 + y^3 - 3axy$	L3 2M
(d)	Examine the sequence $a_n = 2^n$ for convergence.	L4 2M
(e)	Evaluate the Fourier coefficient a_0 for the function $f(x) = |\sin x|$ in $[-\pi, \pi]$	L5 2M

PART-B

Answer any one complete question from each unit.   (5 X 10 = 50 Marks)

Unit – 1

2. (a) Test the consistency and solve the equations $x + y + 2z = 4$, $2x - y + 3z = 9$, $3x - y - z = 2$. — L4 5M

(b) Verify Cayley Hamilton theorem for the matrix $A = \begin{bmatrix} 8 & -8 & 2 \\ 4 & -3 & -2 \\ 3 & -4 & 1 \end{bmatrix}$ — L5 5M

OR

3. (a) Test whether the matrix $A = \begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$ is an orthogonal matrix or not? — L4 5M

(b) Diagonalize the matrix $A = \begin{bmatrix} 1 & 1 & 1 \\ 0 & 2 & 1 \\ -4 & 4 & 3 \end{bmatrix}$ — L3 5M

Unit – II

4. (a) Compute the volume of the solid formed by revolving the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ about the major axis. — L4 5M

(b) Prove that $\int_0^\infty e^{-x^2} dx = \frac{\sqrt{\pi}}{2}$. — L3 5M

OR

5. (a) Evaluate $\int_0^\infty \sqrt{x}\, e^{-x^2}\, dx$ — L4 5M

(b) Expand $f(x) = \log_e x$ in powers of $(x - 1)$ using Taylor's theorem. — L3 5M

Unit – III

6. (a) Find a point on the plane $3x + 2y + z = 12$, which is nearest to the origin. — L1 5M

(b) Evaluate 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 5M

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OR

7. (a) If $z = x^2y + xy^2$, where $x = at^2$, $y = 2at$, then find $\frac{dz}{dt}$ as a total derivative. — L1 5M

(b) Compute $curl\ \vec{F}$, where $\vec{F} = grad(x^3 + y^3 + z^3 - 3xyz)$. — L3 5M

Unit – IV

8. (a) Discuss the nature of the series $\Sigma \{\log\left(1 + \frac{1}{n}\right)\}$ — L2 5M

(b) Examine the convergence of the series $\Sigma \{\frac{1}{\sqrt{n} + \sqrt{n+1}}\}$ — L3 5M

OR

9. (a) Test the convergence of the series $\Sigma \{\frac{1}{\sqrt{n}} \tan \frac{1}{n}\}$ — L2 5M

(b) Show that the series $1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + - - -$ is convergent for all values of x. — L3 5M

Unit – V

10. (a) Obtain the Fourier series of the function $f(x) = x$ in the interval $-\pi \leq x \leq \pi$. — L2 5M

(b) Express $f(x) = x(\pi - x)$ as half range sine series in the interval $0 \leq x \leq \pi$. — L4 5M

OR

11. (a) Expand $f(x) = |x|$ as Fourier series in the interval $(-2, 2)$. — L2 5M

(b) If $f(x) = x(2 - x)$, then find it's half range cosine series in the interval $[0, 2]$. — L4 5M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations May 2023
CHEMISTRY
(ECE & CSE))

Time: 3 hours

Max.Marks: 6(

PART-A
(Compulsory Questions)

1.   Answer the following; (5 X 2 = 10 Marks)
   (a) Give any two difference between Bonding and anti-bonding molecular orbitals.   L2   2M
   (b) What is meant by corrosion?   L1   2M
   (c) Define hard water and soft water.   L3   2M
   (d) Why cannot thermosetting plastics be reused and restored?   L2   2M
   (e) What are the differences between atomic and molecular spectroscopy   L3   2M

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

2. Write down the Schrodinger wave equation for the wave mechanical model of an   L4   10M
    atom. Give the significance of wave function.

OR

3. (a) Illustrate the postulates of crystal field theory.   L3   2M
    (b) Explain the crystal field splitting of orbital's in octahedral, tetrahedral and square   L5   8M
        planar fields in complexes.

UNIT – II

4. Define cell potential. Derive Nernst equation for the calculation of cell emf.   L4   10M
    What are its applications?

OR

5. Explain various factors influencing the rate of corrosion?   L2   10M

UNIT – III

6. How water gets hardness. Distinguish between hard water and soft water and   L4   10M
    Explain Boiler corrosion.

OR

7. (a) Write short notes on Electro dialysis.   L3   5M
    (b) Write short notes on Reverse osmosis.   L3   5M

UNIT – IV

8. What are conducting polymers? Write the synthesis   and engineering   L4   10M
    applications of conducting polymers ?

OR

9. Explain the synthesis of Paracetamol and Aspirin.   L3   10M

UNIT – V

10. (a) Give applications of IR-Spectroscopy   L3   5M
    (b) Give applications of   UV- visible Spectroscopy   L5   5M

OR

11. Explain principle and instrumentation of UV-visible spectroscopy   L5   10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations May 2023
THERMAL AND FLUID ENGINEERING
(EEE)

Time: 3 hours　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　Max.Marks:

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

1.
(a) Why Draft tube is used? Explain　　　　　　　　　　　　　　　　L2　2N
(b) Define the Path and Process.　　　　　　　　　　　　　　　　　L1　2N
(c) Explain Dryness Fraction　　　　　　　　　　　　　　　　　　L3　2N
(d) What are the assumptions of Bernoulli's Equation?　　　　　　　L2　2N
(e) Define coefficient of contraction　　　　　　　　　　　　　　L3　2N

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

2. Explain the different types of hydroelectric power stations　　　　　L5　10I

OR

3. Draw the neat sketch of thermal power plant and explain coal storage system.　　L5　10

UNIT – II

4. Derive the relation between cp & cv　　　　　　　　　　　　　　L1　10

OR

5. (a) Define property? Distinguish between intensive and extensive property　L1　5N
(b) Differentiate between the cyclic process and non-cyclic process　　L3　5N

UNIT - III

6. Draw and explain the P-V, T-H diagram of pure substances.　　　　　L4　10

OR

7. (a) How are boilers classified?　　　　　　　　　　　　　　　　L5　5N
(b) Compare fire tube and water tube Boiler　　　　　　　　　　L4　5N

UNIT - IV

8. (a) Explain the terms: (i) Path line (ii) Streak line (iii) Stream line, and (iv) Stream tube.　　L2　5N
(b) A pipe of diameter 30 cm carries water at a velocity of 20 m/sec. The pressures at the points A and B are given as 34.335 N/cm² and 29.43 N/cm² respectively. While the datum head at A and B are 25 m and 28 m, find the loss of head between A and B.　　L4　5N

OR

9. Discuss the equation of continuity. Obtain an express for continuity equation for a one-dimensional flow.　　L3　10I

UNIT - V

10. (a) What are minor losses? Under what circumstances they are negligible.　　L3　5N
(b) An orifice-meter with orifice diameter 15 cm is inserted in a pipe of 30 cm diameter. The pressure gauges fitted upstream and downstream of the orifice meter give readings of 14.715 N/cm² and 9.81 N/cm² respectively. Find the rate of flow of water through the pipe in liters/s. Take C = 0.6...　　L5　5N

OR

11. Explain the pipes in series and derive equation for total loss of head in pipe.　　L5　10I

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SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations May 2023
ENGINEERING GRAPHICS & DESIGN
(ECE & CSE)

Time: 3 hours

Max.Marks: 60

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

UNIT - I

| 1. | a) | Draw an ellipse having major axis is equal to 100 mm and the minor axis is equal to 70 mm. Use the concentric circle method | L2 | 6M |
| | b) | Draw a parabola having a distance of 50 mm between the focus and directrix. Draw a normal and tangent to the parabola at a point 35 mm from the focus. | L2 | 6M |

OR

| 2. | (a) | Draw the involute of an equilateral triangular of side 20 mm | L2 | 5M |
| | (b) | Draw the involute of a circle of side diameter 50 mm. Draw a tangent and normal to the curve at a distance of 100 mm from the centre of the circle | L3 | 7M |

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. | Draw the projections of a straight line AB of 70 mm long, in the following positions: | | L4 | 12M |

allel to both HP and VP and 20 mm from each.
A - 20 mm above the HP and on VP
allel to and 20 mm above the HP and VP
allel to and 30 mm in front of VP and on HPc)

UNIT - III

| 5. | A square plane ABCD of side 30mm, is parallel to HP and 20 mm away from it. Draw the projections of the plane, when (i) two of its sides are parallel to VP and (ii) and one of its side is inclined at 30⁰ to VP. | | L4 | 12M |

OR

| 6. | A pentagonal prism of base side 30mm and axis 60mm has one of its rectangular faces on the HP and the axis inclined at 60 degree to the VP. Draw its projections. | | L4 | 12M |

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UNIT - IV

| 7. | 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. | | L4 | 12M |

OR

| 8. | A cone of base 50 mm diameter and height 65 mm rests with its base on HP. A section plane perpendicular to VP and inclined at 30 degree to HP bisects the axis of the cone. Draw the development of the lateral surface of the truncated cone. | | L4 | 12M |

UNIT - V

| 9. | (a) | Draw the isometric projection of a hexagonal prism of base side 30 mm and axis 70mm. The prism rests on its base on the HP with an edge of the base parallel to the VP. | L3 | 6M |
| | (b) | Draw the isometric projection of the frustum of a cone of base diameter 60 mm ,top diameter 30mm,and height 55mm. | L3 | 6M |

OR

| 10. | Draw three views of the blocks shown pictorially in figure according to first angle projection | | L4 | 12M |
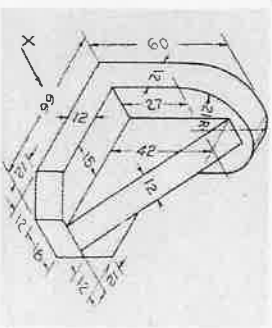
SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B. Tech II Year I Semester Supplementary Examinations May 2023
MATHEMATICS – III
(ECE)

Time: 3 Hours   Max. Marks: 60

PART-A
(Compulsory Questions)

1. Answer the following questions.   (5 X 2 = 10 Marks)
   - (a) State Regula Flasi method formula to find an approximate root of an equation.   L1   2 M
   - (b) Write the Runge Kutta method 4th order formula for first order linear equation.   L2   2 M
   - (c) Evaluate the Laplace transform of $f(t) = e^{at} \cosh bt$.   L3   2 M
   - (d) Define the Fourier sine and Fourier cosine transforms.   L1   2 M
   - (e) Solve the partial differential equation $xp + yq = 3z$.   L3   2 M

PART-B
Answer any one complete question from each unit.   (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 $f(1.4)$ using the Newton's forward interpolation from the following data.   L2   10 M

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

Unit – II

4. Estimate $y(0.1)$, $y(0.2)$ from the differential equation $y' = y^2 + x$, $y(0) = 1$ using Taylor's series method.   L4   10 M

OR

5. Estimate $y(0.1)$, $y(0.2)$ from the differential equation $\frac{dy}{dx} = 1 + xy$, $y(0) = 2$ using Runge-Kutta method of 4th order.   L4   10 M

Unit – III

6. Evaluate $\int_0^\infty \left(\frac{\cos at - \cos bt}{t} \right) dt$ using Laplace transform.   L5   10 M

OR

7. Evaluate $L^{-1}\left\{ \frac{1}{(s^2+5^2)^2} \right\}$ using convolution theorem.   L5   10 M

Unit – IV

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

OR

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

Unit – V

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

OR

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

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations May 2023
ELECTRONIC DEVICES
(ECE)

Time: 3 hours

Max.Marks: 60

PART-A
(Compulsory Questions)

1. Answer the following (5 X 2 = 10 Marks)
   (a) Define barrier potential. L1 2M
   (b) Compare Half wave rectifier and Full wave rectifier. L1 2M
   (c) Mention the applications of Transistor. L1 2M
   (d) Draw the generalized hybrid model for BJT amplifier. L1 2M
   (e) Define Pinch off Voltage. L1 2M

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

UNIT - I

2. Derive the expression for depletion width of a PN Junction. L3 10M

OR

3. (a) Discuss the differences between Ideal Diode and Practical Diode. L2 5M
   (b) Write notes on Diode Resistance. L2 5M

UNIT - II

4. Derive the expressions for Average DC current, Average DC Voltage, RMS Value of L3 10M
   Current, DC Power Output and AC Power Input of a Half Wave Rectifier.

OR

5. A Half wave rectifier has a load of 3.5kΩ. If the diode resistance and the L2 10M
   secondary coil Resistance together have resistance of 800Ω and the input voltage
   of 240V, Calculate (i) Peak, Average and RMS value of the current flowing, (ii)
   DC power output, (iii) AC Power input and (iv) efficiency of the rectifier.

UNIT - III

6. Discuss the Input and Output characteristics of a BJT in CE Configuration. L2 10M
   Indicate the regions of operations in the output characteristics.

OR

7. (a) Describe the Input and Output characteristics of BJT in CC Configuration. L2 5M
   (b) Explain the concept of DC and AC Load lines and discuss the criteria for L2 5M
   fixing the Q-point.

UNIT - IV

8. Design a single stage RC coupled BJT amplifier for the following values. Assume L4 10M
   that for Silicon transistor, Vcc = 10V, Ic = 4mA, hfe = 100, hie = 1kΩ, RL = 100kΩ
   and fL = 100Hz.

OR

9. Using low frequency h-parameter model, derive the expressions for voltage L3 10M
   gain, current gain, input impedance and output admittance for a BJT Amplifier
   in CE configuration.

UNIT - V

10. (a) Describe the construction and working principle of N-channel JFET. L2 5M
    (b) Compare depletion and enhancement MOSFET. L2 5M

OR

11. Derive input impedance, output impedance and voltage gain of JFET Common L2 10M
    Drain amplifier with neat diagram.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations May 2023
DIGITAL SYSTEM DESIGN
(ECE)

Time: 3 hours   Max.Marks

PART-A
(Compulsory Questions)
1.   Answer the following; (5 X 2 = 10 Marks)
  (a) State the Demorgan's theorem.   L1
  (b) Define Prime Implicant and Essential Prime Implicant.   L1
  (c) Give the comparison between synchronous & Asynchronous counters.   L2
  (d) Draw the circuit diagram of CMOS NOR gate.   L2
  (e) State the basic statement used in behavioral Modelling.   L1

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT – I
2. (a) Perform the following using BCD arithmetic.   L3
          i) $(79)_{10}$ + $(177)_{10}$ ii) $(481)_{10}$ + $(178)_{10}$
    (b) Obtain the Dual and complement to the following Boolean expressions.   L4
          i) F=AB+A (B+C) + B' (B+D)   ii) F=A'B+A'BC'+A'BCD+A'BC'D'E
OR
3. (a) Express the Boolean function F= A+B'C as a sum of minterms.   L2
    (b) Convert the following to binary and then to gray code.   L2
          i) $(1111)_{16}$ ii) $(BC54)_{16}$ iii) $(237)_8$ iv) $(164)_{10}$ v) $(323)_8$

UNIT – II
4.   Simplify the following Boolean function for minimal SOP & POS form using K-map i) F (A, B, C,   L4   1
          D) = Σ (0,1,2,5,8,9,10) ii) F (A, B, C, D) = π(1,3,5,7,12,13,14,15).
OR
5. (a) Explain about carry look ahead adder with suitable diagram.   L1
    (b) Implement the following Boolean function using 4:1 Multiplexer.   L4
          F (A, B, C) =Σ (1,2,6,7).
UNIT - III
6.   Draw and explain 4-bit Universal shift register.   L3   1
OR
7. (a) Draw the logic diagram of a JK – flip flop and explain its operation.   L3
    (b) Design a 4-bit synchronous up counter using JK flip flops.   L5

UNIT - IV
8. (a) What is meant by Tristate logic? Draw the circuit of Tristate TTL logic and explain the functions.   L3
    (b) Compare between Different CMOS Logic families.   L4
OR
9.   Implement the following Boolean function using PAL.   L5
          i)   F1 (w,x,y,z) = Σm(0,1,2,3,7,9,11)   ii) F2 (w,x,y,z) = Σm(0,1,2,3,10,12,14)   1
          iii) F3 (w,x,y,z) = Σm(0,1,2,3,10,13,15) iv) F4 (w,x,y,z) = Σm(4,5,6,7,9,15)
UNIT - V
10. (a) Design a logic circuit and write a VHDL program to add 3-bit numbers.   L4
    (b) Explain various data objects in VHDL. Give necessary examples.   L2
OR
11.   Explain in detail about different modeling styles of VHDL with suitable examples.   L2   1

Q.P. Code: 18EC0403

R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations May 2023
SIGNALS & SYSTEMS
(ECE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

1.   Answer the following: (5 X 2 = 10 Marks)
   (a) Distinguish between continuous and discrete time signals?   L2   2M
   (b) State the convolution property?   L1   2M
   (c) Define stability?   L1   2M
   (d) Write the properties of ESD and PSD.   L2   2M
   (e) What is the relation between LT and FT?   L3   2M

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

UNIT - I

2.   Find which of the following signals are causal or non-causal.   L3   10M
     a) $x(t) = sin2t \; u(t)$
     b) $x(t) = cos \; 2t$
     c) $x(n) = u(n + 3) - u(n + 1)$
     d) $x(t) = sin3t \; u(t - 1)$
     e) $x(n) = e^{3n}$

OR

3.   What are the basic operations on signals? Illustrate with an example.   L3   10M

UNIT - II

4.   State and explain the properties of the Discrete time Fourier series   L2   10M

OR

5.   Find the Fourier transform of the following Signals.   L3   10M
     a) $x(t) = e^{-3t} \; sin5t \; u(t)$
     b) $x(t) = e^{at} u(-t)$
     c) $x(t) = cos\omega t \; u(t)$
     d) $x(t) = e^{5t} u(t)$
     e) $x(t) = te^{-2t} u(t)$

UNIT - III

6.   A signal $x(t) = 2 \cos 400\pi t + 6 \cos 640\pi t$ is ideally sampled at fs= 500 Hz . If   L3   10M
     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.

OR

7. (a) Explain the Data reconstruction and ideal reconstruction filter in detail.   L1   5M
    (b) The impulse response of a continuous time system is expressed as   L3   5M
        $h(t) = e^{-2t} u(t)$. Find the Magnitude and frequency response of the system.

UNIT - IV

Q.P. Code: 18EC0403

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8.   Explain the power density spectrum in detail.   L2   10M

OR

9.   Explain the convolution theorem in detail   L1   10M

UNIT - V

10. (a) What is meant by ROC? List the properties of ROC in Z transform   L3   5M
    (b) List the Advantages and limitation of Z transform.   L2   5M

OR

11. Using Properties of Laplace transform, find the Laplace transform of the   L3   10M
     following signals.
     a) $x(t) = te^{-3t} u(t)$
     b) $x(t) = tu(t - 2)$
     c) $x(t) = te^{-2t} u(t - 3)$
     d) $x(t) = 2e^{-6t} u(t) - 10e^{-t} u(-t)$
     e) $x(t) = te^{-2t} sin \; 2t \; u(t)$

Q.P. Code: 18EE0204

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations May 2023
ELECTRICAL MACHINES-I
(EEE)

Time: 3 hours

Max.Marks: 60

PART-A
(Compulsory Questions)

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

(a) What are the basic things required for a generating action?	L1	2M
(b) If the applied voltage of a DC motor is 230 V, then back emf, for maximum power developed is?	L1	2M
(c) What are the limitations of Hopkinson's test?	L3	2M
(d) A 1100/400 V, 50 Hz single phase transformer has 100 turns on the secondary Winding. Calculate the number of turns on its primary, transformation ratio and turns ratio.	L1	2M
(e) What is the function of capacitor in single phase induction motor?	L3	2M

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

UNIT - I

2. A DC Compound Generator has 110V as terminal voltage. The armature resistance, shunt field Resistance and series field resistance are 0.06Ω, 25Ω and 0.04Ω respectively. The load consists of 200 lamps each rated at 55W. Find the total emf generated and armature current when the machine is connected as (i) Long Shunt (ii) Short Shunt. L4 10M

OR

3. (a) How demagnetizing and cross magnetizing ampere turns per pole are calculated in a DC Machine? L2 5M

(b) The brushes of a certain lap connected 400kw, 6-pole generator are given a lead of 18° electrical. From the data given, calculate (i) the demagnet-izing ampere-turns (ii) the cross-magnetizing ampere-turns (iii) series turns required to balance the demagnetizing component. The full load current is 750A and total number of conductors are 900 and the leakage coefficient is 1.4. L4 5M

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. L2 10M

OR

5. A shunt generator has a full load current of 195A at 250V. The stray losses are 720W & shunt field coil resistance is 50 ohms. It has a full load efficiency of 90%.Find armature resistance. Also find the current corresponding to maximum efficiency. L4 10M

UNIT - III

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

Q.P. Code: 18EE0204

OR

7. In a Brake test conducted on a a dc shunt motor the full load readings are observed as;Tension on tight side = 9.1kg, Tension on slack side = 0.8 kg. Total current = 10A, Supply voltage=110V, Speed = 1320 r.p.m. The radius of the pulley is 7.5cm. Calculate its full load efficiency. L4 10M

UNIT - IV

8. Discuss the constructional features of transformers. Draw neat diagram. L2 10M

OR

9. (a) Derive the e. m. f. equation of a transformer. L3 5M

(b) A single phase 50Hz transformer has 100 turns on the primary and 400 turns on the secondary winding. The net cross sectional area of core is 250 cm². If the primary winding is connected to a 230V , 50Hz determine (i) EMf induced in the secondary winding(ii) The maximum value of flux density in the core . L4 5M

UNIT - V

10. (a) Explain the double revolving field theory and draw the torque speed characteristics. L2 5M

(b) 1-Ø Induction Motor is 4 pole, Output= 410w, Supply voltage=230V, frequency =50Hz, input current =3.2A, power factor=0.7, Speed = 1410 rpm, Calculate i) the efficiency and ii) the slip of the motor when delivering rated output. L5 5M

OR

11. A 2 kVA, 115/230 V, 50HZ transformer gave the following test results: Short-circuit test: 13 V, 8.7 A, 100 W Open circuit test: 115 V, 1.1 A, 50 W Determine,(i) the transformer equivalent circuit referred to primary and insert all the values in it. (ii) Calculate the voltage regulation and efficiency at full load at 0.8 power factor lagging. (iii) Maximum efficiency at 0.8 power factor lagging. L2 10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations May 2023
ELECTROMAGNETIC THEORY AND TRANSMISSIONLINES
(ECE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

1. Answer the following (5 X 2 = 10 Marks)
    (a) Define Coulomb's law   L1   2M
    (b) What is meant by Magnetostatic fields   L1   2M
    (c) Define In consistency of Ampere's law   L1   2M
    (d) List wave equation for E and H in free space   L1   2M
    (e) What is characteristic impedance   L1   2M

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

UNIT - I

2. Explain the following with expression. a) Coloumb's law.   L2   10M
    b) Electric field
    intensity c) Gauss law.

OR

3. (a) Find the electric field at a point P located with a   L2   6M
        distance of r from an
        infinite sheet with uniform surface charge density of ps C/m2.
    (b) A Point Charge of 20pc is Located at the Origin.   L2   4M
        Determine the Magnitude
        and Direction of the electric field intensity at the Point (1,3, -4).

UNIT - II

4. Find H for a straight current carrying conductor using   L2   10M
    Biot Savart's law and
    Ampere's Circuit law.

OR

5. Explain any two applications of Ampere's Circuit law.   L2   10M

UNIT- III

6. Explain and determine the EMF for the Following i)   L2   10M
    Motional EMF.
    (ii)Transformer EMF.

OR

7. (a) Explain Faraday's law of electromagnetic induction   L2   5M
        and derive the
        Expression for Induced EMF.
    (b) Explain the motional EMF and derive the expression   L2   5M
        for the maxwell
        equation.

UNIT- IV

8. Explain the followings with an expression i) Linear   L2   10M
    polarization   ii) Circular
    polarization iii) Elliptical polarization

OR

9. In a medium, E = 14 sin (2 X   t - 2x)   V/m Determine   L3   10M
    the followings: i) The
    propagation constant ii) The wavelength iii) The speed of the wave iv) Sketch

the wave at t=0, T/4 & T/2

UNIT - V

10. (a) Explain about the smith chart for finding the SWR   L2   7M
        and Reflection co-
        efficient
    (b) List out the applications of smith chart   L1   3M

OR

11. A 50Ω lossless transmission line is terminated on a   L3   10M
    load impedance of ZL =(25 +
    j 50)Ω. Use the smith chart to find i) Voltage reflection coefficient. ii) VSWR. iii)
    input impedance of the line, given that the line is 3.3λ long

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations May 2023
CONTROL SYSTEMS
(EEE & ECE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

1.   Answer the following: (5 X 2 = 10 Marks)
 (a) What is block diagram? What are the basic components of block diagram?   L2   2M
 (b) Define peak overshoot?   L1   2M
 (c) What is the necessary condition for stability?   L2   2M
 (d) What is phase and gain cross over frequency?   L2   2M
 (e) Write the state equation?   L3   2M
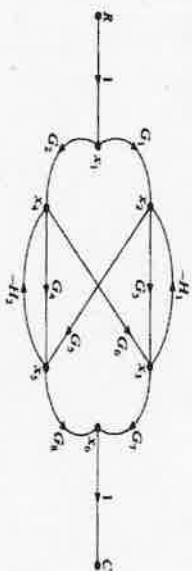
PART-B
(Answer all five units, 5 x 10 =50 Marks)

UNIT- I

2.   For the mechanical system shown in the figure draw the force-voltage and   L6   10M
     force-current analogous circuits.

OR

3.   Using mason gain formula find the transfer function $\frac{C}{R}$ for the signal flow   L3   10M
     graph shown in figure.

UNIT - II

4.   List out the time domain specifications and derive the expressions for Rise   L1   10M
     time, Peak time and Peak overshoot.

OR

5. (a) Measurements conducted on a servo mechanism, show the system   L3   5M
        response to be $c(t) = 1+0.2e^{-60t} - 1.2e^{-10t}$. When subject to a unit step
        input.Obtain an expression for closed loop transfer function, determine
        the undamped natural frequency, damping ratio?
    (b) For servo mechanisms with open loop transfer function given below what   L3   5M

    type of input signal give rise to a   constant steady state error and calculate   L5   10M
    their values. $G(s)H(s)=\frac{10}{s^2(s+1)(s+2)}$.

UNIT- III

6.   With the help of Routh's stability criterion determine the stability of the   L5   10M
     following systems represented by the characteristic equations:
 (a) $s^4 + 8 s^3 + 18 s^2 + 16s + 5 = 0$.
 (a) $s^6 + 2s^5 + 8s^4 + 12s^3 + 20s^2 + 16s + 16 = 0$.

OR

7.   Develop the root locus of the system whose open loop transfer function is   L3   10M
     $G(s) H(s) = \frac{K(s^2+6s+25)}{s(s+1)(s+2)}$.

UNIT- IV

8. (a) Given $\xi = 0.7$ and $\omega_n = 10$ rad/sec. Calculate resonant peak, resonant   L3   5M
        frequency and bandwidth.
    (b) Sketch the polar plot for the open loop transfer function of a unity   L3   5M
        feedback system is given by $G(s) = \frac{1}{s(1+s)(1+2s)}$.Determine Gain Margin &
        Phase Margin.

OR

9.   Obtain the transfer function of Lead Compensator, draw pole-zero plot   L5   10M
     and write the procedure for design of Lead Compensator using Bode plot.

UNIT - V

10. (a) State the properties of State Transition Matrix.   L1   5M
    (b) Diagonalize the following system matrix $A = \begin{pmatrix} 0 & 6 & -5 \\ 1 & 0 & 2 \\ 3 & 2 & 4 \end{pmatrix}$ L3   5M

OR

11. (a) Find state variable representation of an armature controlled D.C.motor.   L2   5M
    (b) A state model of a system is given as: L1   5M
        $\dot{x} = \begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -6 & -11 & -6 \end{pmatrix}X + \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix} U$ and $Y = (1 \ 0 \ 0)X$
        Determine: (i) The Eigen Values. (ii) The State Transition Matrix.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations May 2023
DIGITAL SIGNAL PROCESSING
(ECE)

Time: 3 hours   Max. Marks: 60

PART-A
(Compulsory Questions)

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

    (a)   What is the need for the frequency domain sampling?   L1   2M
    (b)   Illustrate the effect of warping on magnitude and phase response.   L2   2M
    (c)   Compare rectangular and Hanning window.   L3   2M
    (d)   Why rounding is preferred over truncation in realizing digital filters?   L1   2M
    (e)   Why PDSPs are preferred over advanced microprocessors and the RISC   L3   2M
        processors?

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

2.   Compute 8-point DFT of the sequence x(n)= {0,1,2,3,4,5,6,7,8} using radix-2   L3   10M
     DIT-FFT Algorithm.

OR

3.   (a)   State and prove the following properties of DFT (i) Linearity   (ii) Complex   L1   7M
        conjugate property (iii) Circular convolution   (iv) Time reversal
    (b)   Compare DFT and FFT algorithms.   L2   3M

UNIT - II

4.   Apply the bilinear transformation, to design a high pass filter, monotonic in   L3   10M
    pass band with cut off frequency of 1000 Hz and down 10dB at 350 Hz, the
    sampling frequency is 5000Hz.

OR

5.   Determine an analog Chebyshev filter transfer function that satisfies the   L3   10M
    constraints.

$$\frac{1}{\sqrt{2}} \le |H(j\Omega)| \le 1 \; ; \; 0 \le \Omega \le 2$$
$$|H(j\Omega)| \le 0.1 \; ; \; \Omega \ge 4$$

UNIT - III

6.   Develop an ideal Band pass filter with the frequency response   L3   10M

$$H_d(e^{jw}) = 1 \; for \frac{\pi}{4} \le |\omega| \le \frac{3\pi}{4}$$
$$= 0 \; Otherwise$$

    Find the values of h (n) for N=11. Find H (z) and plot the frequency
    response.

OR

7.   (a)   Explain the design steps of FIR filters using windows.   L2   5M

    (b)   State and explain the properties of FIR filters. State their importance.   L4   5M

UNIT - IV

8.   The output signal of an A/D converter is passed through a first order low   L4   10M
    pass filter with transfer function H (Z) = (1-a) z / (z-a) for 0< a <1.
    Determine the steady state output noise power due to quantization at the
    output of the digital filter.

OR

9.   Explain the characteristics of a limit cycle oscillation with respect to the   L3   10M
    system described by the equation y (n) = 0.95 y (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.

UNIT - V

10.   (a)   What is meant by memory mapped register? How is it different from a   L1   5M
        memory?
    (b)   Discuss the various Circular Buffer Registers in detail.   L2   5M

OR

11.   With a neat sketch explain the architecture of TMS 320C50 processor.   L2   10M

R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations May 2023
DIGITAL COMMUNICATIONS
(ECE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

1.   Answer the following: (5 X 2 = 10 Marks)
      (a)   Define quantization noise.   L1   2M
      (b)   List out the properties of matched filter.   L1   2M
      (c)   Why do we require equalization for a communication system?   L2   2M
      (d)   Give the advantages of Passband transmission.   L1   2M
      (e)   Define the term Metric in Viterbi Algorithm.   L1   2M

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

UNIT - I
2.   (a)   Draw the block diagram of digital communication system. Explain each block.   L3   5M
      (b)   Compare PCM and DPCM.   L3   5M
                                          OR
3.   (a)   Illustrate the block diagram of PCM transmitter and receiver.   L2   5M
      (b)   Discuss the noise effects in Delta Modulation.   L2   5M

UNIT - II
4.   With relevant example discuss about the duo-binary signaling scheme.   L3   10M
                                          OR
5.   (a)   Describe in detail about Inter symbol interference and its effects.   L2   5M
      (b)   Write a brief note on Eye pattern and construct the diagram.   L2   5M

UNIT - III
6.   Extend the concept of continuous AWGN channel into a vector channel.   L4   10M
                                          OR
7.   (a)   Show the procedure of Gram-Schmidt orthogonalization.   L4   5M
      (b)   Elaborate the concept of Schwarz Inequality.   L4   5M

UNIT - IV
8.   (a)   Sketch the diagram of M-array PSK transmitter and receiver.   L2   5M
      (b)   Discuss in brief about coherent detection of binary FSK.   L2   5M
                                          OR
9.   (a)   Illustrate the pass band transmission model with neat diagram.   L2   5M
      (b)   Determine the expression for probability of error for BPSK.   L4   5M

UNIT - V
10.   (a)   Write a brief note on Error detection and correction codes.   L2   5M
      (b)   Describe the matrix representation of linear block codes.   L2   5M
                                          OR
11.   For a systematic (7, 4) linear block code the sub matrix 'P' is given as   L5   10M

P= $\begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 0 \\ 1 & 0 & 1 \\ 0 & 1 & 1 \end{bmatrix}$

R18

Detect & correct the error using syndrome vector for the code vectors
i) $Y_A = [0111110]$
ii) $Y_B = [1011100]$
iii) $Y_C = [1010000]$

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Supplementary Examinations May 2023
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 Framework?   L2   2M
  (b) Create a simple application on Action Bar.   L3   2M
  (c) Enumerate Spinner?   L3   2M
  (d) Recall Projection?   L2   2M
  (e) Recall the use of SMS?   L3   2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT – I
2   Describe the life cycle of an Android activity with neat sketch?   L3   10M
OR
3 (a) Enumerate XML Layout?.   L1   2M
   (b) What information Intent object consists? Explain different types of   L2   8M
        intents along with usage.
UNIT – II
4 (a) When Relative Layout issued?   L1   4M
   (b) Describe any six attributes of Relative Layout.   L6   5M
OR
5 (a) How to create User Interface Programmatically.   L1   5M
   (b) Develop relevant code for the above.   L1   4M
UNIT – III
6 (a) Explain any Four of Basic Views.   L4   6M
   (b) Give Example for each view.   L6   4M
OR
7 (a) Differentiate List View and Spinner View.   L5   5M
   (b) Using the Spinner View, Write a Program to Display One Item at a Time.   L4   5M
UNIT – IV
8 (a) What is the use of SQLite database?   L1   2M
   (b) How to provide database connection using SQLite database.   L1   8M
OR
9 (a) How to Store and Retrieve all contacts from the Table Using Database   L3   7M
        Programmatically.
   (b) Give Example for the above?   L2   3M
UNIT – V
10   Create a Simple Own Service to start and stop the service in Android?   L6   10M
OR
11   Express how to Publishing your application on the Android Market. Explain?   L1   10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Supplementary Examinations May 2023
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) Mention the categorization of intelligent systems   L1 2M
(b) What are the four ways to evaluate an algorithm? Name them?   L1 2M
(c) Identify types of pruning processes.   L2 2M
(d) What is supervised learning?   L1 2M
(e) Discuss about nearest neighbor?   L2 2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT - I
2. (a) Compare and contrast Human Intelligence to Artificial Intelligence.   L4 5M
   (b) Discuss about agents and various Properties of environment.   L2 5M
OR
3. (a) Explain the components of problem definition with an example.   L1 5M
   (b) Predict the foundations of Artificial Intelligence?   L5 5M
UNIT - II
4. (a) State and explain in detail about optimization problems?   L2 5M
   (b) Describe the process of simulated annealing with example?   L1 5M
OR
5. (a) Summarize various types of Hill climbing search techniques in AI.   L2 5M
   (b) Outline the concept of breadth-first search technique with suitable example. L2 5M
       List performance measure of BFS.
UNIT - III
6. (a) What is classification? Where do we use classification with an example? L1 5M
   (b) Describe classification in machine learning.   L2 5M
OR
7. (a) Extend back propagation algorithm with example.   L2 5M
   (b) Explain Bayesian Decision Theory in artificial intelligence.   L2 5M
UNIT - IV
8. (a) Demonstrate in detail about supervised learning after clustering.   L2 5M
   (b) Illustrate about the spectral clustering in supervised learning.   L2 5M
OR
9. (a) Describe in detail about maximization algorithm?   L2 5M
   (b) In factor analysis, how can we find the remaining ones if we already know L2 5M
       some of the factors?
UNIT - V
10. (a) Analyze the K-Nearest Neighbor Estimator   L4 5M
    (b) Elaborate non parametric classification?   L6 5M
OR
11. (a) What is the use of temporal difference algorithms in reinforcement learning? L1 5M
    (b) Explain in detail about partially observables state in learning?   L2 5M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Supplementary Examinations May 2023
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. — L2 — 2M
(b) Distinguish between DCT and DFT. — L1 — 2M
(c) Give the applications of color image processing. — L3 — 2M
(d) What do you mean by image enhancement and image restoration? — L2 — 2M
(e) Define compression ratio. — L3 — 2M

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

UNIT - I

2. Explain about the basic pixel relationships and distance measures between pixels in a digital image. — L3 — 10M

OR

3.
(a) Summarize the concepts of image modeling with relevant expressions. — L2 — 5M
(b) List out the various applications of digital image processing. — L4 — 5M

UNIT - II

4.
(a) Determine the Hadamard matrix for N =8 using recursive calculation from N=2. — L4 — 5M
(b) Apply 2D – Discrete Fourier Transform for the following image — L4 — 5M

$$f(m,n) = \begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \end{bmatrix}$$

OR

5. State and Prove the following two properties of 2D-DFT:
i) Convolution   ii) Correlation — L4 — 10M

UNIT - III

6.
(a) Describe about types of smoothing filters in frequency domain with the required expressions. — L4 — 5M
(b) Discuss the CIE chromaticity diagram and mention its significance. — L2 — 5M

OR

7.
(a) Illustrate the image negative transformation with suitable example. — L2 — 5M
(b) Discuss about the linear and non-linear spatial filters with necessary expressions. — L2 — 5M

UNIT - IV

8. Explain the following with respect to motion in segmentation. — L2 — 10M
a) Spatial Techniques   b) Frequency Domain Techniques

OR

9.
(a) Outline the concept of image gradient and its properties in edge detection. — L3 — 5M
(b) Explain the role of thresholding in segmentation. — L2 — 5M

UNIT - V

10.
(a) What is redundancy in image compression? Discuss the importance of data redundancies — L2 — 5M
(b) Write a short note on Arithmetic and Huffman coding. — L2 — 5M

OR

11. Classify the compression standards for images & videos and explain the same. — L4 — 10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B. Tech I Year I Semester Supplementary Examinations May 2023
ALGEBRA AND CALCULUS
(Common to ALL)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit

(5 x 12 = 60 Marks)

UNIT-I

1 Find the eigen values and eigen vectors of the matrix $A = \begin{bmatrix} 5 & -2 & 0 \\ -2 & 6 & 2 \\ 0 & 2 & 7 \end{bmatrix}$ L1 12M

OR

2 Reduce the quadratic form $2x^2 + 2y^2 + 2z^2 - 2xy - 2yz + 2zx$ in to the canonical   L1 12M
form by orthogonal transformation and discuss its nature.

UNIT-II

3 Obtain Maclaurin's series expansions of the functions (i). $f(x) = e^x$, (ii). $f(x) = \sin x$ L3 12M

OR

4 Prove that $\frac{\pi}{3} - \frac{1}{5\sqrt{3}} > \cos^{-1}\left(\frac{3}{5}\right) > \frac{\pi}{3} - \frac{1}{8}$ using Lagrange's mean value theorem.   L3 12M

UNIT-III

5 If $u = \log(x^3 + y^3 + z^3 - 3xyz)$, then prove that $\left(\frac{\partial}{\partial x} + \frac{\partial}{\partial y} + \frac{\partial}{\partial z}\right)^2 (u) = -\frac{9}{(x+y+z)^2}$ L2 12M

OR

6 Calculate the shortest and longest distance from the point $(3, 1, -1)$ to the sphere   L2 12M
given as $x^2 + y^2 + z^2 = 4$

UNIT-IV

7 Evaluate $\iint (x^2 + y^2)\, dxdy$ in the positive quadrant for which $x + y \leq 1$ L4 12M

OR

8 Evaluate $\iiint (xy^2z)\, dxdydz$ taken over positive octant of the sphere $x^2 + y^2 + z^2 = a^2$ L4 12M

UNIT-V

9 Prove that $\beta(m,n) = 2\int_0^{\pi/2} \sin^{2m-1}\theta \cos^{2n-1}\theta\, d\theta$ L5 12M

OR

10 Show that $\int_0^1 \left(\frac{x^2}{\sqrt{1-x^4}}\right) dx \times \int_0^1 \left(\frac{1}{\sqrt{1-x^4}}\right) dx = \frac{\pi}{4}$ L5 12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B. Tech I Year I Semester Supplementary Examinations May 2023
ENGINEERING PHYSICS
(CIVIL)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	a)	Define dot product of two vectors and write their properties.	L1	8M
	b)	Two vectors are given by A=4ĵ-7k̂ and B=5î+3ĵ find their dot product.	L3	4M

OR

2	a)	State and explain the Kepler's laws of planetary motion.	L1	8M
	b)	If the Earth be one half of its present distance from the sun, what will be the number of days in a year?	L3	4M

UNIT-II

3	a)	What is Hooke's law? Explain.	L1	4M
	b)	Describe the behavior of a wire under an increasing load.	L2	8M

OR

4	a)	Define Young's modulus and bulk modulus.	L1	4M
	b)	Obtain the relation between the Young's modulus and bulk modulus.	L2	8M

UNIT-III

5	a)	Describe the factors affecting the acoustics of buildings	L2	6M
	b)	Outline the remedies that must be followed for an acoustically good hall.	L2	6M

OR

6	a)	Describe the piezoelectric effect.	L2	4M
	b)	Explain the production of ultrasonics by piezoelectric method.	L2	8M

UNIT-IV

7	Derive the equation of motion of simple harmonic oscillator and find its solution.	L4	12M

OR

8	a)	Distinguish between damped and forced oscillations with suitable examples.	L4	6M
	b)	Explain the phenomenon of resonance and write the applications of resonance in various fields.	L2	6M

UNIT-V

9	a)	What are nanomaterials? Explain the basic principles of nanomaterials.	L1	6M
	b)	Outline the properties of nanomaterials that are affected due to increased surface area to volume ratio.	L2	6M

OR

10	a)	Describe any one method of fabrication of nanomaterials.	L2	8M
	b)	Write any four applications of nanomaterials.	L1	4M

SIDDHARTH INSTITUTE OF SCIENCE & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations May-2023
ADVANCED PHYSICS
(MECH)

Time: 3 hours   Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

1	a)	Describe the formation of Newton's ring with necessary theory.	L2	7M
	b)	What is coherence? Explain spatial and temporal coherence.	L3	5M

OR

2	a)	Derive the conditions to get principal maximum and minimum intensity positions due to single slit due to Fraunhofer single slit diffraction.	L2	8M
	b)	A plane transmission grating having 4250 lines per cm is illuminated with sodium light normally. In the second order spectrum, the spectral lines are deviated by 30^0. What is the wavelength of the spectral line?	L1	4M

UNIT-II

3	a)	Write Sabine's formula for reverberation time? Mention factors controlling the reverberation time?	L4	7M
	b)	Explain Piezoelectric effect.	L4	5M

OR

4	a)	How will you classify sound waves based on their frequencies?	L1	6M
	b)	Write the properties of Ultrasonic waves.	L2	6M

UNIT-III

5	a)	A circular loop of copper having a diameter of 10 cm carries a current of 500 mA calculate the magnetic moment associated with the loop.	L2	4M
	b)	Explain B-H curve of ferromagnetic material.	L1	8M

OR

6	a)	Discuss the frequency dependence of various polarization process in dielectric materials.	L1	8M
	b)	The dielectric constant of He gas at NTP is 1.0000684. calculate the electronic polarizability of He atoms if the gas contains 2.7×10^{25} atoms per m^3	L3	4M

UNIT-IV

7	a)	Explain the construction and working of Nd:YAG laser with suitable energy level diagram.	L2	8M
	b)	Write brief note on applications of lasers?	L3	4M

OR

8	a)	Differentiate step index and graded index fibers.	L2	6M
	b)	Explain the black diagram of fiber communication system?	L1	6M

UNIT-V

9	a)	Explain ball milling technique for synthesis of nanomaterial?	L2	9M
	b)	What is the future scope of nanomaterials?	L3	3M

OR

10	a)	What is bottom up approach and explain sol-gel preparation method with neat diagram?	L2	8M
	b)	Write advantages of sol-gel process?	L1	4M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations May 2023
PYTHON PROGRAMMING
(ECE & CSE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1 a) Define Variable and mention rules for choosing names of Variable with   L1   6M
example
   b) Illustrate the Input and Output statements with example.   L2   6M
OR
2 a) What is Set? Explain set Operations   L1   6M
   b) What is Dictionary? Explain the Methods available in Dictionary   L2   6M

UNIT-II

3   Examine the syntax of the following statements with example program. i)   L4   12M
While loop ii) for loop
OR
4 a) Create a Python program to display Fibonacci series.   L6   6M
   b) Develop a Python program to Swapping of two numbers with and without   L6   6M
using temporary variable.

UNIT-III

5   Explain about different types of arguments in Python.   L2   12M
OR
6 a) What is Polymorphism? How will you perform Method Overloading?   L1   6M
   b) Illustrate Method Overriding in Python with suitable example.   L3   6M

UNIT-IV

7   What is package in Python? Explain the use of packages in your program   L3   12M
with an example code.
OR
8 a) What is Regular expression in python? Illustrate searching with example   L2   6M
program.
   b) Illustrate matching with example program.   L2   6M

UNIT-V

9   Describe in detail about Iterators and Generators with an example.   L2   12M
OR
10 a) What are Data Management and Object Persistence? Explain in detail   L1   6M
   b) Describe the Turtle using python program.   L2   6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations May 2023
ENGINEERING MECHANICS
(CE & MECH)

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

UNIT-I

1   A system of connected flexible cable shown in Fig.3 is supporting two vertical forces 200 N   L4   12M
    and 250 N at points B and D. Determine the forces in various segments of the cable
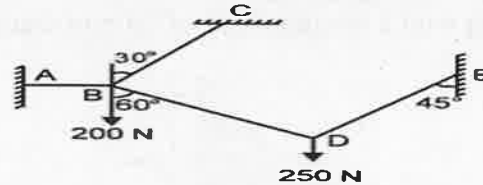
OR

2   A simply supported beam AB of span 6 m is loaded as shown in Fig.. Determine the   L3   12M
    reactions atA and B.
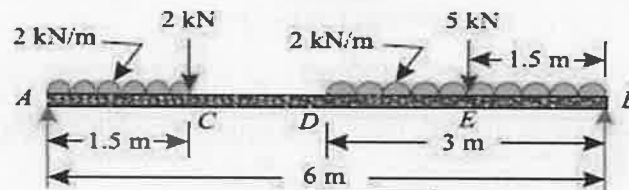
UNIT-II

3   Find the least force required to drag a body of weight 'W' placed on a rough inclined plane   L1   12M
    having inclination 'α' to the horizontal. The force is applied to the body in such a way that it
    makes an angle 'Θ' to the inclined plane and the body is on the point of motion up the plane.

OR

4   L4   12M

A ladder of length 4 m, weighing 200 N is placed against a vertical wall as shown in Fig The
coefficient of friction between the wall and the ladder is 0.2 and that between floor and thé
ladder is 0.3. The ladder, in addition to its own weight, has to support a man weighing 600 N
at a distance of 3 m from A. Calculate the minimum horizontal force to be applied at A to
prevent slipping.

UNIT-III

5   L4   12M

A uniform lamina shown in Fig consists of a rectangle, a circle and a triangle. Determine the
centre of gravity of the lamina. All dimensions are in mm

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations May 2023
ENGINEERING GRAPHICS
(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.	L3	12M

OR

2	Construct an ellipse when the distance between the focus and the directrix is 50 mm and the eccentricity is 2/3. Draw tangent and normal at a point 40 mm from the directrix.	L3	12M

UNIT-II

3	A square ABCD of 50mm side, has its corner A in the H.P, its diagonal AC is inclined at 30^0 to the H.P and the diagonal BD is inclined at 45^0 to the V.P and parallel to H.P. Draw its projections.	L3	12M

OR

4	a)	Two point A and B are on H.P, the point A being 30 mm in front of V.P, while B is 45 mm behind V.P. The line joining their top views makes an angle of 45^0 with XY. Find the horizontal distance between two points.	L3	6M
	b)	A line MN is 25mm long and inclined at 30^0 to HP and parallel to VP. The end M of the line is 10mm above HP and 15mm in front of VP. Draw the projections of the line.	L3	6M

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 45^0 to H.P.	L3	12M

OR

6	A cylinder of base 40 mm and 60mm length having its axis vertical is cut by section plane perpendicular to VP inclined at 45° to HP and intersecting the axis at 32 mm above the base. Draw its front view, sectional top view, and true shape of the section.	L3	12M

UNIT-IV

7	A square pyramid with side of base 30 mm and axis 50 mm long, is resting on its base on H.P with an edge of the base parallel to V.P. It is cut by a section plane, perpendicular to V.P and inclined at 45^0 to H.P. The section plane is passing through the mid-point of the axis. Draw the development of the surface of the cut pyramid.	L3	12M

OR

8	A vertical square prism, base 50mm side and height 90mm long. It is completely penetrated by another square prism, base 40mm side and 90mm long, faces of which are equally inclined to the VP. The axes of	L3	126 M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B. Tech II Year I Semester Supplementary Examinations May 2023
PROBABILITY, NUMERICAL METHODS AND TRANSFORMS
(EEE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1   In a certain town 40% have brown hair, 25% have brown eyes and 15% have both   L1   12 M
    brown hair and brown eyes. A person is selected at random from the town.(i). If
    he has brown hair, what is the probability that he has brown eyes also? (ii). If he
    has brown eyes, find the probability, that he does not have brown hair?

OR

2   In a bolt factory, machines A, B, C respectively manufactures 20%, 30%, 50% of   L1   12 M
    the total of their output in which 6%, 3%, 2% are defective. If a bolt is drawn at
    random and found to be defective, then find the probabilities that it is
    manufactured from (i). Machine A, (ii). Machine B, (iii). Machine C.

UNIT-II

3   Predict a real root of the equation $xe^x - \cos x = 0$ using Newton – Raphson method.   L2   12 M

OR

4   Estimate the value of y at $x = 0.12$ from the following data by using Newton's   L2   12 M
    forward interpolation formula.

x	0.10	0.15	0.20	0.25	0.30
y	0.1003	0.1511	0.2027	0.2553	0.3093

UNIT-III

5   Using Taylor's series method, evaluate $y(0.1)$, $y(0.2)$ and $y(0.3)$ from the   L3   12 M
    differential equation $y' = y^2 + x, y(0) = 1$.

OR

6   Using (i). Trapezoidal rule, (ii). Simson's 1/3rd rule, (iii). Simpson's 3/8th rule,   L3   12 M
    evaluate $\int_0^1 \left(\frac{1}{1+x}\right) dx$ and compare the result with actual value.

UNIT-IV

7   Evaluate the Laplace transform of (i). $f(t) = t^2 e^{2t} \sin 3t$, (ii). $f(t) = \frac{1-\cos at}{t}$.   L4   12 M

OR

8   Evaluate $L^{-1}\left\{\frac{1}{(s^2+5^2)^2}\right\}$ using convolution theorem.   L4   12 M

UNIT-V

9   Determine $Z\{\cos nt\}$, $Z\{\sin nt\}$ and hence determine $Z\{n.\cos nt\}$, $Z\{n.\sin nt\}$.   L5   12 M

OR

10 Determine y_n from the difference equation $y_{n+2} + 2y_{n+1} + y_n = n, y_0 = y_1 = 0$ by   L5   12 M
    using the Z – transforms technique.

Q.P. Code: 19HS0834

R19

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations May 2023
NUMERICAL METHODS AND TRANSFORMS
(ECE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1		Find a positive root of $x^3 - x - 1 = 0$ correct to two decimal places by Bisection method.	L3	12M

OR

2	a)	Using Newton's forward interpolation formula and the given table of values obtain the value of $f(x)$ when $x=1.4$.	L3	6M

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

	b)	Use Newton's backward interpolation formula to find $f(32)$ given $f(25)=0.2707, f(30)=0.3027, f(35)=0.3386, f(40)=0.3794.$	L2	6M

UNIT-II

3		Find $y(0.1)$, $y(0.2)$ & $y(0.3)$ using Taylor's series method given that $y' = y^2 + x$ and $y(0) = 1$.	L3	12M

OR

4	a)	Compute $\int_0^4 e^x dx$ by Simpson's $\frac{3}{8}$rule with 12 sub divisions.	L2	6M
	b)	Compute $\int_3^7 x^2 \log x dx$ using Trapezoidal rule by taking 10 sub divisions.	L2	6M

UNIT-III

5	a)	Find the Laplace transform of $f(t) = e^{3t} - 2e^{-2t} + \sin 2t + \cos 3t + \sinh 3t - 2\cosh 4t + 9.$	L2	6M
	b)	Find the Laplace transform of $f(t) = \frac{1 - \cos at}{t}$.	L2	6M

OR

6	a)	Find $L^{-1}\left\{\frac{3s-2}{s^2-4s+20}\right\}$ by using first shifting theorem.	L3	6M
	b)	Find the Inverse Laplace transform of $\frac{1}{s(s^2+a^2)}$.	L2	6M

UNIT-IV

7		Obtain the Fourier series expansion of $f(x) = x-x^2$ on $[-\pi, \pi]$.Hence show that $\frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} - - - - = \frac{\pi^2}{12}$.	L1	12M

OR

8	a)	Find the half range sine series expansion of $f(x) = x^2$ when $0 < x < 4.$	L2	6M
	b)	Find the half range cosine series expansion of $f(x) = x(2 - x)$in $0 \le x \le 2.$	L3	6M

UNIT-V

Q.P. Code: 19HS0834

R19

9		Find the Fourier transform of $f(x) = \begin{cases} 1; |x| < a \\ 0; |x| > a \end{cases}$ and hence evaluate $i) \int_{-\infty}^{\infty} \frac{\sin ap \, \cos px}{p} dp$ $ii) \int_{-\infty}^{\infty} \frac{\sin p}{p} dp$ $iii) \int_a^{\infty} \frac{\sin ap}{p} dp.$	L3	12M

OR

10	a)	Find the Fourier cosine transform of $e^{-ax} \cos ax. a > 0.$	L3	6M
	b)	Find the finite Fourier sine transform of $f(x)$,defined by $f(x) = \begin{cases} x, 0 \le x \le \frac{\pi}{2} \\ \pi - x, \frac{\pi}{2} \le x \le \pi \end{cases}$	L3	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations May 2023
MICROPROCESSORS AND MICROCONTROLLERS
(ECE)

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

UNIT-I

1		Illustrate the operation of Microprocessor Controlled Temperature System with the help of a neat sketch.	L3	12M

OR

2	a)	Sort computers into categories such as huge computers and single chip microcontrollers.	L3	6M
	b)	Explain the terms i) SSI ii) MSI iii) LSI iv) VLSI v) ULSI	L2	6M

UNIT-II

3		Illustrate the operation for the following instructions when executed over a sample 8-bit data 24H. i. RAL ii. RLC iii. DAD	L3	12M

OR

4	a)	Explain the Arithmetic Instructions of 8085 µP with an example.	L2	6M
	b)	Explain the different types of interrupts available in 8085 µP.	L2	6M

UNIT-III

5	a)	Formulate the various registers present in 8051 µC into Data registers and Address registers.	L5	6M
	b)	Formulate port 3 of 8051 µC to facilitate the operation of timer/counter, serial port, memory port and external interrupt port.	L5	6M

OR

6	a)	Configure 8051 µC to perform 9-bit serial data communication.	L5	6M
	b)	Explain the functionality of each pin of 8051 µC and draw the pin configuration.	L2	6M

UNIT-IV

7		List various addressing modes of 8051 microcontroller and explain them with an example each.	L1	12M

OR

8	a)	Explain Jump and Call instructions of 8051 µC with an example.	L2	6M
	b)	Write an assembly program of 8051 µC to multiply two 8-bit numbers and store the result in a memory location.	L3	6M

UNIT-V

9		With the help of a neat diagram show the interfacing of LCD Display with 8051 µC and explain its operation.	L3	12M

OR

10	a)	With the help of a neat diagram, show the interfacing of ADC 0808 with 8051 µC and explain its operation.	L3	6M
	b)	Illustrate key bouncing problem and de-bouncing solutions.	L3	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations May 2023
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 cylindrical thin drum 80 cm in diameter and 3 m long has a shell thickness of 1   L3   12M
    cm. If the drum is subjected to an internal pressure of 2.5 N/mm², Take E= 2x 10⁵
    N/mm² Poisson's ratio 0.25.Determine (i) change in diameter (ii) change in
    length and   (ii) change in volume.

OR

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

UNIT-II

3   A trapezoidal masonry dam having 4 m top width, 8 m bottom width and 12 m   L3   12M
    high, is retaining water upto a height of 10 m as shown in fig. The density of
    masonry is 2000 kg/m3 and coefficient of friction between dam and soil is 0.55.
    The allowable compressive stress is 343350 N/m2. Check the stability of dam.

UNIT-III
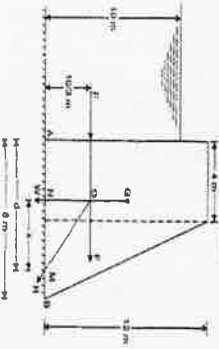
4   Determine the diameter of a bolt which is subjected to an axial pull of 9 kN   L3   12M
    together with a transverse shear force of 4.5 kN using :
) Maximum principal stress theory.
) Maximum principal strain theory.
    Given the elastic limit in tension = 225 N/mm2, factor of safety = 3 and Poisson's
    ratio = 0.3.

OR

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

OR

6   A closely coiled helical spring made of 10 mm diameter steel wire has 15 coils of   L3   12M
    100 mm mean diameter. The spring is subjected to an axial load of 100 N.
    Calculate :The maximum shear stress induced,The deflection, and Stiffness of the
    spring.Take modulus of rigidity, C = 8.16 × 10⁴ N/mm²

UNIT-IV

7   A fixed beam of length 6 m carries two point loads of 30 kN each at a distance of 2   L3   12M
    m from both ends. Determine the fixed end moments and draw the B.M. diagram.

OR

8   Analyze the beam and draw BMD and SFD   L3   12M
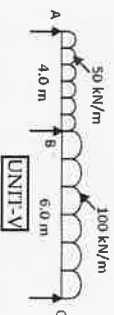
UNIT-V

9   Draw the B.M. and torsion diagrams for a semicircular beam of radius 'R. The   L3   12M
    cross-section of the beam is circular with radius It is loaded with a load at the
    mid-point of the semicircle.

OR

10 Explain the importance of simply supported on three supports equally spaced.   L2   12M

Q.P. Code: 19EE0202

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY:PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations May 2023
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 star connected load.   L3   12M

OR

2 An unbalanced 4 wire star connected load has a balanced voltage of 400V. The load are $Z_1=(4+j8)\,\Omega$, $Z_2=(5+j4)\Omega$, $Z_3=(15+j20)\Omega$ .Calculate line currents , current in neutral wire, total power.   L4   12M

UNIT-II

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

OR

4 A series RC circuit consists of resistor of 10Ω and capacitor of 0.1F has a constant voltage of 20v is applied to the circuit at t=0,obtain the current equation. Determine the voltage across the resistor and the capacitor.   L3   12M

UNIT-III

5 Determine current in 5Ω resistor for the circuit shown in figure.   L5   12M
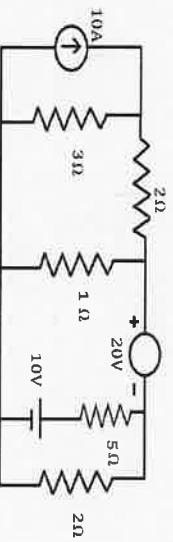
OR

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

UNIT-IV

Q.P. Code: 19EE0202
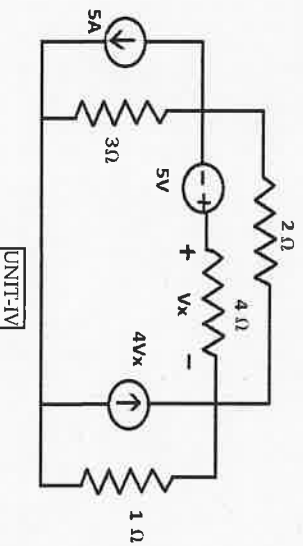
7 Derive the expressions for Z-parameters in terms of ABCD parameters.   L3   12M

OR

8 Obtain the T parameters of the following two port network.   L5   12M
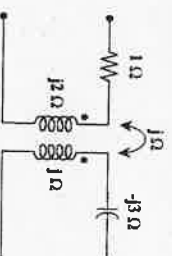
UNIT-V

9 Find the inverse Laplace transform of $F(S) = \frac{1}{(s+2)^2}$.   L4   12M

OR

10 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

Q.P. Code: 19EE0242

R19

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations May 2023
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 Mesh analysis and write the steps for writing mesh   L2   6M
         analysis.
    b)   Determine the current in 10Ω resistor for the following network by   L4   6M
         using nodal analysis.
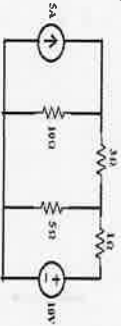
OR

2   a)   State and prove Reciprocity theorem.   L2   6M
    b)   Determine the equivalent current source between the terminals A and B. L2   6M

UNIT-II

3   a)   Explain about Quality factor and Band-width of Series resonance.   L2   6M
    b)   A series RLC circuit has R=10Ω, L=0.1H and C=50µF. The applied   L4   6M
         voltage is 100V. Find Resonant frequency & Quality factor of a coil.

OR

4   a)   Explain about classification of filters.   L2   6M
    b)   Draw the characteristics of Low-pass and High-pass filters.   L1   6M

UNIT-III

5   a)   Derive the Transient Response of series RL-circuit with D.C excitation. L2   6M
    b)   A series RL circuit with R=30Ω and L= 15H has a constant voltage   L4   6M
   V=60v applied at t=0. Determine the current "I", voltage across
         resistor and voltage across inductor.

OR

6   a)   Derive the Transient Response of series RC-circuit with D.C excitation. L2   6M
    b)   In the circuit shown in figure, determine the complete solution for the L4   6M
         current when switch is closed at t=0, applied voltage is V(t)= 50 Cos
         (10²t+ Π/4), resistance R=10Ω and capacitance C= 1µF.

Q.P. Code: 19EE0242

R19

UNIT-IV

7   a)   Find the h-parameters of the network shown in figure.   L4   6M
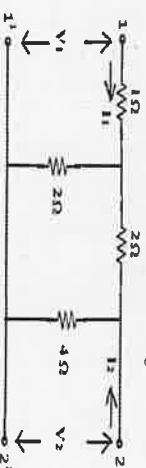
    b)   The Z - parameters of a two - port network are Z₁₁= 10Ω, Z₂₂= 15Ω,   L4   6M
         Z₁₂= 5Ω and Z₂₁= 5Ω. Find the equivalent T-network and ABCD
         parameters.

OR

8   a)   Find the Z-parameters of the network shown in below figure   L4   6M
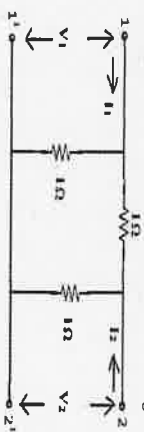
    b)   The given ABCD parameters are, A = 2, B = 0.9, C = 1.2, D = 0.5. Find L4   6M
         Y-parameters.

UNIT-V

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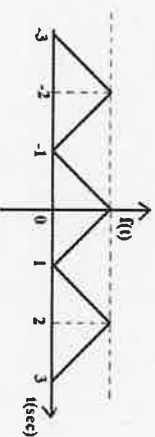
    b)   Derive the Exponential form of Fourier series   L2   6M

OR

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

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations April- 2023
COMPUTER ORGANIZATION AND ARCHITECTURE
(CSE)

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

UNIT-I

1		Illustrate any four addressing modes with neat sketch.	L4	12M
		OR		
2	a)	Describe various steps of instruction cycle?	L2	6M
	b)	Explain in detail about Data Transfer Instructions?	L2	6M

UNIT-II

3		Show the steps of signed operand multiplication with example?	L2	12M
		OR		
4	a)	Describe about fixed and floating point representations.	L2	6M
	b)	Give the steps in Booth multiplication algorithm ?	L3	6M

UNIT-III

5	a)	Narrate the three- state bus buffers with neat sketch?	L4	6M
	b)	Describe about 4-bit incremental with suitable example?	L2	6M
		OR		
6	a)	What is Hardwired Control? Explain in detail with a neat diagram?	L4	6M
	b)	Write about Bus transfer with neat diagram?	L3	6M

UNIT-IV

7		Describe the use of DMA controllers in a computer system with a neat block diagram ?	L4	12M
		OR		
8	a)	Explain briefly about Memory Hierarchy with neat sketch?	L4	6M
	b)	Differentiate between RAM & ROM?	L4	6M

UNIT-V

9		Define the hazards? Explain in detail about instruction hazards?	L3	12M
		OR		
10	a)	Draw 8×8 omega switching network with explanation?	L2	6M
	b)	List out the conflicts in pipelining and explain about it.	L2	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations May 2023
Surveying & Geomatics
(CE)
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.	L2	12M

OR

2	a)	Briefly explain the principles of surveying?	L2	6M
	b)	Write short notes on types of errors.	L1	6M

UNIT-II

3		What are the indirect methods of locating a contour? Write about any two method.	L2	12M

OR

4	a)	Write short notes on errors in leveling	L1	6M
	b)	Discuss the effects of curvature and refraction in leveling.	L2	6M

UNIT-III

5	a)	Find the horizontal and vertical distances by tangential method when both angles are angles of elevation.	L3	6M
	b)	How would you, determine the constants K and C of a Tacheometer.	L3	6M

OR

6	a)	What is an analytical lens? Establish the basic equation for an analytic lens.	L5	6M
	b)	What is tacheometry? What are different systems of tacheometric measurements?	L5	6M

UNIT-IV

7		A compound curve is made up of two arcs of radii 380 m and 520 m. The deflection angle of the combined curve is 1050 and that of the first arc of radius 380 m is 580. The chainage of the first tangent point is 848.55 m. find the chainage of the point of intersection, common tangent point, and forward tangent point.	L3	12M

OR

8	a)	Define and draw a typical compound curve. Under what circumstance compound curves are provided.	L4	6M
	b)	Derive the expression for the elements of a compound curve.	L4	6M

UNIT-V

9		Describe with sketch, the fundamental measurement of angles and distances by total station.	L2	12M

OR

10	a)	Explain in detail about the infrared type of EDM instrument.	L3	6M
	b)	Write short notes on total stations.	L1	6M

R19

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations May 2023
FLUID MECHANICS & HYDRAULIC MACHINERY
(MECH)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

1 a) Calculate the density, specific weight and weight of one litre of a petrol of specific gravity is 0.7. L3 6M
   b) Define surface tension. Derive an expression for the surface tension in a liquid droplet. L2 6M

OR

2 a) State Pascal's law. What do you understand by the terms; Absolute, Gauge and Vacuum pressures L1 6M
   b) A simple U-tube manometer containing mercury is connected to a pipe in which a fluid of specific gravity is 0.8 and having vacuum pressure is flowing. The other end of the manometer is open to atmosphere. Find the vacuum pressure in pipe, if the difference of mercury level in the two limbs is 40cm and the height of fluid in the left from the center of pipe is 15cm below. L3 6M

UNIT-II

3 Derive the Bernoulli's equation from fundamentals. State the assumptions made in the derivation. L3 12M

OR

4 a) Explain Energy gradient line and Hydraulic gradient line. L2 4M
   b) The water is flowing through a pipe having diameter 20cm and 10cm at section 1 and 2 respectively. The rate of flow through the pipe is 35 liters/s. Section 1 is 6 m above the datum and section 2 is 4 m above datum. If the pressure at section 1 is 39.24 N/cm², Find the intensity of pressure at section 2. L3 8M

UNIT-III

5 What is the use of Venturimeter? Derive an expression for the measurement of rate of flow using Venturimeter. L2 12M

OR

6 a) List out various minor losses occur in pipe flows with the corresponding equations for all. L1 6M
   b) Find the head lost due to friction in a pipe of diameter 300 mm and length 50 m, through which water is flowing at a velocity of 3 m/s using Darcy formula. L2 6M

UNIT-IV

7 a) Derive an expression for the force exerted by a jet of water on an inclined fixed plate in the direction of the jet. L3 6M
   b) A jet of water of diameter 50 mm moving with a velocity of 40 m/s, strikes a curved symmetrical plate at the centre. Find the force extracted by jet of water in the direction jet, if the jet is deflected through an angle of 120° at the outlet of the curved plate. L3 6M

R19

8 a) Explain the different types of hydroelectric power stations. L2 6M
   b) Explain the factors to be considered while selecting a site for hydroelectric power plant. L2 6M

OR

9 Explain the working of a Pelton wheel with a neat sketch and derive the equation for hydraulic efficiency L2 12M

UNIT-V

10 a) What is priming of a pump? L1 4M
   b) A centrifugal pump delivers water against a net head of 14.5 m and a design speed of 1000 r.p.m. The vanes are curved back to an angle of 30° with the periphery. The Impeller diameter is 300mm and outlet width is 50mm. Determine the discharge of the pump if manometric efficiency is 95%. L3 8M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations May 2023
ELECTRONIC DEVICES AND CIRCUITS
(EEE & ECE)
Time: 3 Hours   Max. Marks: 60
Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

1 a) Illustrate the action of PN junction diode under forward bias and reverse   L2   6M
       bias and sketch its V-I Characteristics.
   b) Determine the expression for Diffusion capacitance of a PN Junction   L3   6M
       Diode.

OR

2 a) Analyze the current components in a PN diode and determine the   L3   6M
       expression for diode current equation.
   b) Discuss the Positive and Negative Diode Clippers with neat waveforms.   L2   6M

UNIT-II

3 a) Construct the circuit diagram of a Full wave rectifier and explain its   L3   6M
       operation with the help of input and output waveforms.
   b) Explain Liquid Crystal Display. Illustrate dynamic scattering LCD and   L2   6M
       field effect LCD with neat diagram.

OR

4 a) Discuss the principle involved in working of Varactor diode and give its   L2   6M
       characteristics.
   b) Demonstrate the construction, working and characteristics of UJT with   L2   6M
       neat diagram.

UNIT-III

5 a) Describe the Input and Output characteristics of BJT in CE   L2   6M
       Configuration.
   b) Explain the operation and characteristics of n-channel enhancement type   L2   6M
       MOSFET with the help of a neat diagram.

OR

6 a) Compare the performance of JFET with MOSFET.   L4   6M
   b) Derive the relation between α, β and γ of a Transistor.   L3   6M

UNIT-IV

7 a) Determine the expressions for the stability factors S, S' and S'' of a BJT   L3   6M
       fixed bias.
   b) Discuss Diode Compensation Technique for the parameters V_{BE} and I_{CO}. L2   6M

OR

8 a) Discuss about Thermal Runaway and Thermal Resistance.   L2   6M
   b) Calculate the Q-point values for the circuit shown in the Fig.   L4   6M

UNIT-V
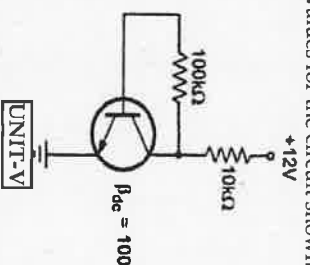
9 a) Obtain the expressions for current gain, voltage gain, input impedance   L3   6M
       and output impedance of CB amplifier using simplified hybrid model.
   b) Discuss the frequency response of an amplifier.   L2   6M

OR

10   A CE amplifier is driven by a voltage source of internal resistance Rs =   L3   12M
       800Ω and the load impedance of R_L=1000Ω. The h-parameters are h_{ie}=1k,
       h_{fe}=50, h_{oe} = 25μA/V and h_{re} = 2 × 10⁻⁴. Calculate current gain, voltage
       gain, input impedance and output impedance using exact analysis and
       approximate analysis.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations May 2023
BUILDING MATERIALS AND CONSTRUCTION
(CE)
Time: 3 Hours   Max. Marks: 60
Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

1		Explain classification of bricks and ingredients of bricks.	L3	12M
		OR		
2	a)	What are the characteristics of good timber in building industry.	L2	6M
	b)	Explain the methods of precautions of stones.	L2	6M

UNIT-II

3		Explain the manufacturing of wet and dry process of ordinary Portland cement With flow chart.	L3	12M
		OR		
4	a)	Explain the workability of concrete and explain any two methods.	L1	6M
	b)	Explain laboratory tests of cement.	L1	6M

UNIT-III

5	a)	How do you differentiate between fine and coarse aggregates.	L1	6M
	b)	Explain the test procedure for aggregate impact value test.	L1	6M
		OR		
6	a)	What are steps involved in process of painting a plastered surface.	L1	6M
	b)	How do you conduct sieve analysis on coarse aggregate in laboratory?	L1	6M

UNIT-IV

7		Explain the types of bonds in stone masonry.	L2	12M
		OR		
8	a)	Differentiate brick and stone masonry.	L1	6M
	b)	Discuss the remedial measures of foundation failures.	L1	6M

UNIT-V

9		Explain classification of stairs with examples.	L3	12M
		OR		
10	a)	Discuss the defects in plastering and pointing briefly?	L2	6M
	b)	Draw a neat diagram of lintels and name the parts and explain.	L2	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations May 2023
ELECTRICAL MACHINES-I
(EEE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

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

OR

2	a)	What are the causes for the failure of self-excitation?	L2	6M
	b)	Distinguish between Lap and Wave windings?	L2	6M

UNIT-II

3		Explain the principle of operation of a D.C motor. Derive the equation for the torque Developed by a D.C. motor?	L2	12M

OR

4		Why is a starter necessary for a DC motor? Explain the working of a three-point starter with the help of a neat diagram?	L1	12M

UNIT-III

5	(a)	Enumerate the losses in DC machine.	L1	6M
	(b)	Derive the condition for maximum efficiency.	L1	6M

OR

6		A Shunt generator delivers 195A at terminal Voltage of 250V. The armature resistance and shunt Field resistances are 0.02 Ω and 50 Ω respectively. The iron and friction losses equal 950W. Find (a) EMF generated (b) Copper losses (c) output of the prime mover (d) commercial, mechanical and electrical Efficiencies	L5	12M

UNIT-IV

7	(a)	In a transformer, derive the condition for maximum efficiency and thus find the load current at which the efficiency is maximum:	L3	6M
	(b)	A 20KVA,2000/200V single phase transformer has the Following parameters H.V winding: R1=3Ω, X1=5.3Ω, L.V winding: R2=0.05 Ω, X2=0.1 Ω. Find the Voltage Regulation at (i) p.f of 0.8 lagging (ii) UPF (iii) 0.707 p.f leading.	L3	6M

OR

8	a)	What is an ideal transformer? Also explain the operation of an ideal single phase transformer under no load condition.	L2	6M
	b)	An ideal 25KVA transformerhas 500 turns on the primary winding and 40 turns on the secondary winding. The primary is connected to 3000V, 50HZ supply. Calculate (i) primary and secondary currents at full load (ii) secondary emf and (iii) the maximum core flux.	L2	6M

UNIT-V

9		Explain the Scott connection of two single phase transformers with neat circuit diagram.	L2	12M

OR

10	a)	Determine load shared by two transformers are each transformer when connected in parallel With equal voltage ratios	L2	6M
	b)	Draw and explain the Connection diagram of Y-Δ & Δ-Y connected 3-phase transformer.	L2	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations May 2023
SIGNALS SYSTEMS RANDOM PROCESSES
(ECE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	Illustrate the following system is (i)Static or dynamic (ii) Linear or Non-Linear (iii) Time invariant or time variant $d^3y(t)/dt^3+2d^2y(t)/dt^2+4\ dy(t)/dt+3y^2(t)=x(t+1)$	L3	12M

OR

2	a)	Define various elementary signals in continuous time indicate them graphically.	L1	6M
	b)	Define various elementary signals in discrete time and indicate them graphically	L1	6M

UNIT-II

3	Exponential Fourier Series for the signal given below.	L3	12M
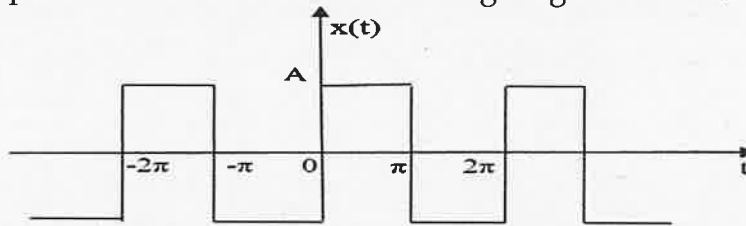
OR

4	a)	Explain about representation of a signal in exponential Fourier series.	L4	6M
	b)	Illustrate the Exponential Fourier series coefficient.	L4	6M

UNIT-III

5	a)	State and prove time convolution theorem with Fourier transform.	L1	6M
	b)	State and prove frequency convolution theorem with Fourier transforms.	L1	6M

OR

6	a)	Determine the Transfer function, impulse response and step response of an LTI system.	L3	6M
	b)	Differentiate LTI system and LTV system.	L2	6M

UNIT-IV

7		Illustrate the Laplace transform of the following signals using properties of Laplace transform. (i) $x(t)=t\ e^{-t}\ u(t)$ (ii) $x(t)=t\ e^{-2t}\ sin2t\ u(t)$	L3	12M

OR

8	a)	Discuss about the Linearity, Time Shifting and Time Reversal Properties of Laplace transform.	L2	6M
	b)	Find the Laplace transform for any 3 standard signals.	L5	6M

UNIT-V

9		Define ACF? State and explain any four properties of ACF?	L1	12M

OR

10	a)	Explain the concept of cross power density spectrum.	L2	6M
	b)	Demonstrate the properties of cross power density spectrum.	L2	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations May 2023
DATABASE MANAGEMENT SYSTEMS
(CSE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	a)	Explain the Architecture of Database with a neat diagram.	L4	6M
	b)	Write a short note on Database users and administrators?	L3	6M

OR

2	a)	Explain about ER model and Component of ER Diagram.	L4	6M
	b)	Implementthe DML Commands – Insert, Select Commands,update& delete Commands.	L6	6M

UNIT-II

3	a)	Develop the working of union, intersection and except operations.	L3	6M
	b)	Distinguish between two set theoretic operations of relational algebra with an example.	L2	6M

OR

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

UNIT-III

5	a)	Illustrate redundancy and the problems that it can cause.	L2	6M
	b)	Explain about Functional Dependency.	L4	6M

OR

6	a)	Consider the schema: R (A, B, C, G, H, I) and the set of FD's $(A \to B, A \to C, CG \to H, CG \to I, B \to H)$. Prove the members of F^+: A $\to$ H, CG $\to$ HI, AG $\to$ I with axioms is true.	L3	6M
	b)	Consider the relation scheme R = {E, F, G, H, I, J, K, L, M, M} and the set of functional dependencies {{E, F} -> {G}, {F} -> {I, J}, {E, H} -> {K, L}, K -> {M}, L -> {N} on R. What is the key for R?	L5	6M

UNIT-IV

7	a)	Discuss How do you implement Atomicity and Durability.	L6	6M
	b)	What is a Transaction? Explain the properties of the transaction. Explain the States of the transaction with a neat sketch.	L4	6M

OR

8	a)	What are the states of transaction?	L1	6M
	b)	What are the two statements regarding transaction?	L1	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 about failure with loss of non-volatile storage.	L2	6M
	b)	What are the methods that are used in log based recovery?	L1	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations APRIL 2023
LINUX PROGRAMMING
(CSE)

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

UNIT-I

1 Discuss about the Following Commands?   L3   12M
   a) date   b) who   c) passwd   d) bc   e) script
                              OR

2 a) Describe in detail about the structure of UNIX   L3   6M
   b) Illustrate the user and group in Unix? Explain the related commands   L3   6M
      for changing ownership and group.

UNIT-II

3 Explain the following options?   L4   12M
   (a) emacs   (b) noglob
   (c) verbose   (d) xtrace   (e) ignoreeof
                              OR

4 a) What is redirection? Explain it in detail.   L2   6M
   b) Explain in detail about command line editing with basic vi   L2   6M
      commands.

UNIT-III

5 a) How text manipulation is done in vi? Explain.   L3   6M
   b) Explain about comparing files with examples?   L3   6M
                              OR

6 a) How files with duplicate lines are handled in Unix.   L3   6M
   b) Write a shell program for counting characters, words and line? L3   6M

UNIT-IV

7 Illustrate (i) Atoms   ii) Operators   L4   12M
                              OR

8 a) Define the grepfamily ?   L4   6M
   b) Mention the primary difference between fgrep and the other two L4   6M
      members of the family ?

UNIT-V

9 Detail about the variables associated with C shell.   L1   12M
                              OR

10 a) Explain the startup scripts in the C Shell?   L3   6M
   b) what are the shutdown scripts in the C Shell?   L3   6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations May 2023
MANAGEMENT SCIENCE
(CSE)

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

UNIT-I

1		Define Management. Describe nature and importance of Management	L6	12M

OR

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

UNIT-II

3		Discuss and Explain the various types plant layout with suitable examples?	L6	12M

OR

4	a)	Explain the functions of marketing.	L2	6M
	b)	Define the term "work study" and state its objectives.	L1	6M

UNIT-III

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

OR

6	a)	Write short notes on: a) Placement and Employee Induction.	L1	6M
	b)	Write short notes on: a) Job analysis	L1	6M

UNIT-IV

7		Explain SWOT analysis and its components by taking an industry example.	L4	12M

OR

8	a)	Differentiate between PERT and CPM.	L2	6M
	b)	Define PERT and importance in Network analysis	L1	6M

UNIT-V

9		Elaborate the how modern concepts like JIT, MRP, Six Sigma changed the production environment?	L6	12M

OR

10	a)	What is TQM and its importance?	L1	6M
	b)	What is balanced score card? How it is useful for a company?	L1	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B. Tech III Year I Semester Supplementary Examinations May 2023
ESTIIMATION, COSTING AND VALUATION
(CE)
Time: 3 Hours   Max. Marks: 60
Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

1	Explain Types of estimate in detail.	L3	12M
	OR		
2	a)	Explain long wall and short wall method and center line method.	L3	6M
	b)	Calculate detailed estimate of single room building using individual wall method or center line method. Assume necessary data.	L3	6M

UNIT-II

3	(i). Explain mid and mean sectional area method with tabular form. (ii). Explain Prismoidal and trapezoidal formula	L3	12M
	OR		
4	a)	Estimate the quantity of earthwork for an embankment 120 m long, 6 m wide at crest, side slope is 2:1, the central height from 0 to 120 m at every 30 m interval are 0.6, 1.2, 1.6, 2, 1.3.	L5	6M
	b)	Calculate the quantity of earth work for 150 m length for a portion of a road in an uniform ground the heights of banks at the two ends being 1.20 m and 1.80 m. The formation width is 9 metre and side slopes 2:1 [Horizontal : Vertical]. Assume that there is no transverse slope.	L5	6M

UNIT-III

5	a)	(i) Explain bar-bending schedule with example. (ii) Determine unit weight of steel of different diameters.	L3	6M
	b)	Draw the sketch of the steel bars and derive the additional length in two cases one bent up of 45 degree cranked bar and one bent up of 30 degree cranked bar.	L3	6M
	OR		
6	a)	Explain the quantity of steel for any type of RCC Slab with an illustrative example.	L5	6M
	b)	Explain the quantity of steel for any type of RCC beam and column with an illustrative example.	L5	6M

UNIT-IV

7	(i) What do you mean by Analysis of Rate? Write its purpose. (ii) What do you mean by overhead cost? (iii) List out general overheads and job overheads.	L4	12M
	OR		
8	a)	Prepare analysis of rates for the following item of work: Plain cement concrete 1 : 5 : 10 in foundation or floor with brick ballast 40 mm gauge – Unit one cubic metre.	L4	6M
	b)	Prepare analysis of rates for the following item of work: RCC work in column 1:1.5:3 – Unit one cubic metre.	L4	6M

UNIT-V

9	Explain detailed specification for the following (i) Reinforced Cement Concrete and (ii) Brick work	L3	12M
	OR		
10	a)	What is Valuation? Write the purpose of valuation.	L3	6M
	b)	Explain method of calculating depreciation.	L3	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations May 2023
POWER ELECTRONICS
(EEE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	Explain the Types of Power Semiconductor Devices and Mention Advantages, Applications of Power Semi-Conductor Devices?	L2	12M

OR

2	Draw and explain V-I characteristics of SCR and Its working.	L4	12M

UNIT-II

3	Explain the operation of single phase half wave converter with R load at $\alpha=60$ with necessary waveforms. Also derive the output voltage, output current and RMS output voltages.	L3	12M

OR

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

UNIT-III

5	Explain about Control Techniques of choppers in details	L2	12M

OR

6	Explain the boost converter operation with help of diagram and also draw the output waveforms.	L2	12M

UNIT-IV

7	Explain the operation of single phase to single phase bridge type step-down cyclo converter with R-L Load for continuous conduction mode.	L2	12M

OR

8	Draw and explain bridge type step-up cyclo converter with R-L Load for discontinuous conduction mode	L4	12M

UNIT-V

9	Draw and Explain the operation of single phase full wave AC voltage controller with R-L load.	L2	12M

OR

10	Explain about the single phase half wave AC voltage controller with resistive load	L2	12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B. Tech III Year I Semester Supplementary Examinations May 2023
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   Derive the expression for Electric and Magnetic Fields radiated   L3   12M
       by Quarter Wave Monopole $(\frac{\lambda}{4})$ and Sketch its Field Strength
       pattern.

OR

2 a) Explain the antenna beam efficiency with suitable equations   L2   6M
   b) Explain briefly Radiation Intensity and Antenna Gain.   L2   6M

UNIT-II

3 a) Design Yagi-Uda antenna of six elements to provide a gain of   L4   6M
       12dB if the operating frequency is 200.
   b) Discuss advantages, disadvantages and applications of Yagi-Uda   L4   6M
       antenna.

OR

4 a) What are the applications of helical antennas?   L1   6M
   b) Discuss about the horn antenna types & its characteristics.   L2   6M

UNIT-III

5 a) Explain the gain measurement using absolute method.   L2   6M
   b) Determine the HPBW, BWFN and Diameter of a parabolic dish   L4   6M
       antenna provides, if it provides a power gain of 50 dB at 10 GHz
       with 70% efficiency.

OR

6 a) Draw the parabolic reflector and explain its principle.   L2   6M
   b) Explain Cassegrain feed system and mention its advantages.   L2   6M

UNIT-IV

7   Compare the Broadside and End-fire uniform linear arrays.   L4   12M

OR

8 a) Derive the directivity expression of an end fire array.   L3   6M
   b) Explain the pattern multiplication with suitable examples.   L2   6M

UNIT-V

9   For a flat earth assume that at 400 km reflection takes place. The   L4   12M
       maximum density of ionosphere corresponds to a refractive
       index of 0.9 at 10 MHz. Calculate i) Range for which maximum
       usable frequency is 10 MHz and ii) Maximum usable frequency
       for a critical frequency of 20 MHz and an angle of incidence of
       35^0.

OR

10 a) Explain the ground wave propagation with the necessary diagram   L2   6M
   b) Derive the skip distance and explain   L3   6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations May 2023
DESIGN OF MACHINE ELEMENTS-I
(MECH)

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

UNIT-I

1   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   12M

OR
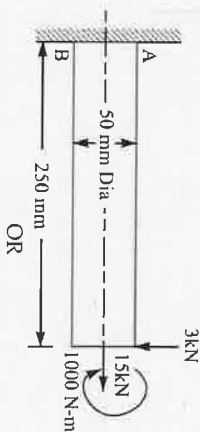
2 a) How do you classify materials for engineering use?   L3   6M
   b) Draw the stress-strain diagram for mild steel. Explain.   L2   6M

UNIT-II

3   Define the following terms
   i) Theoretical Stress concentration factor
   ii) Fatigue Stress concentration factor
   iii) Endurance limit with the effect of size, load and surface factors
   Fatigue failure   L3   12M

OR

4 a) Define the term "stress concentration" with suitable diagram and "stress concentration factor" also.   L2   6M
   b) A machine component is subjected to a fluctuating stress that varies from 40N/mm² to 100 N/mm². The corrected endurance limit of the machine component is 270 N/mm². The ultimate stress and yield point stress of the material are 600 and 400N/mm² respectively. Find the factor of safety using: (i) Gerber formula. (ii)Soderberg line. (iii) Goodman line.   L2   6M

UNIT-III

5 a) Explain Stress in screw fasteners due to Combined Forces?   L5   6M
   b) Two machine parts are fastened together tightly by means of a 24 mm tap bolt. If the load tending to separate these parts is neglected, find the stress that is set up in the bolt by the initial tightening.   L5   6M

OR

6   A plate 75 mm wide and 12.5 mm thick is joined with another plate by a single transverse weld and a double parallel fillet weld as shown in Fig. The maximum tensile and shear stresses are 70 MPa and 56 MPa respectively. Find the length of each parallel fillet weld, if the joint is subjected to both static and fatigue loading.   L5   12M

UNIT-IV

7   Design and draw a cotter joint to support a load varying from 30 kN in compression to 30 kN in tension. The material used is carbon steel for which the following allowable stresses may be used. The load is applied statically. Tensile stress = compressive stress = 50 MPa ; shear stress = 35 MPa and crushing stress = 90 MPa.   L1   12M

OR
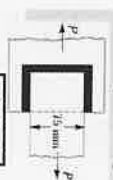
8 a) What type of stresses are induced in shafts?   L2   6M
   b) A solid circular shaft is subjected to a bending moment of 3000 N-m and a torque of 10 000 N-m. The shaft is made of 45 C 8 steel having ultimate tensile stress of 700 MPa and a ultimate shear stress of 500 MPa. Assuming a factor of safety as 6,determine the diameter of the shaft.   L3   6M

UNIT-V

9   Design a cast iron protective type flange coupling to transmit 15 kW at 900 r.p.m. from an electric motor to a compressor. The service factor may be assumed as 1.35. The following permissible stresses may be used :Shear stress for shaft, bolt and key material = 40 MPaCrushing stress for bolt and key = 80 MPa
   Shear stress for cast iron = 8 MPa
   Draw a neat sketch of the coupling.   L3   12M

OR

10 a) What is a key? State its function with neat sketch.   L3   6M
   b) Design the rectangular key for a shaft of 50 mm diameter. The shearing and crushing stresses for the key material are 42 MPa and 70 MPa.   L3   6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations May 2023
HYDRAULIC ENGINEERING
(CIVIL)

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

UNIT-I

1		Explain specific force curve in detail and obtain the condition for critical state of flow.	L1	12M

OR

2	a)	Derive the condition for a trapezoidal channel to be most economical.	L1	8M
	b)	A rectangular channel carries water at a rate of 350 liter/sec when bed slope is 1 in 2500. Find the most economical dimensions of the channel if C = 50.	L1	4M

UNIT-II

3		What is back water curve and afflux? Derive the expression for length of back water curve?	L1	12M

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	8M
	b)	Derive an expression for loss of energy due to hydraulic jump.	L3	4M

UNIT-III

5	a)	Derive the equation for force exerted by a jet on stationary inclined flat plate.	L3	6M
	b)	Find the force exerted by a jet of water of diameter 90mm on a stationary flat plate, when the jet strikes the plate normally with velocity of 25m/s.	L3	6M

OR

6	a)	Derive the condition for force on the inclined plate moving in the direction of the jet.	L3	6M
	b)	Derive the condition for force on the flat vertical plate moving in the direction of jet.	L3	6M

UNIT-IV

7		Explain any three different types of similarity laws with derivation.	L3	12M

OR

8	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		What is a turbine and give the classification in detail	L1	12M

OR

10	a)	List out various types of efficiencies of a turbine in detail	L3	6M
	b)	Explain Radial flow reaction turbine with a neat diagram	L3	6M

R19

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations May 2023
ELECTRICAL POWER GENERATION & TRANSMISIION SYSTEMS
(EEE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

| 1 | | Explain the function of the following in thermal power plant and explain the principle of operation of each. a)economizer b)Electrostatic precipitaior c)condenser d)super heater e) Cooling tower. | L2 | 12M |

OR

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

UNIT-II

| 3 | | Write a short note on following (i) Chain reaction (ii) Nuclear fission (iii) List demerits of a nuclear power plant. | L1 | 12M |

OR

| 4 | a) | What is the classification of nuclear reactors? | L1 | 6M |
| | b) | Explain about the boiling water reactor. | L2 | 6M |

UNIT-III

| 5 | a) | What is Skin effect? Explain. | L3 | 4M |
| | b) | Determine the inductance/phase/km of a double circuit 3-phase line. The radius of each conductor is 30mm and the conductors are placed on the circumference of an imaginary circle at a distance of 10m forming a regular hexagonal figure. | L6 | 8M |

OR

| 6 | a) | Derive the expression for flux linkages of one conductor in a group of n-conductors. | L3 | 6M |
| | b) | Determine the inductance per km per phase of a single circuit 20kVline of given configuration as shown in fig. The conductors are transposed and have a diameter of 4.5cm. | L2 | 6M |

4.5 cm

5.5 m

5.5 m

UNIT-IV

| 7 | | An overhead 3-phase transmission line delivers 350KW at 10KV at 0.85 pf lagging. The resistance and reactance of earth conductors are 1.5Ω and 4Ω per phase respectively. Determine (i) The sending end voltage.(ii) percentage regulation.(iii) Transmission efficiency. | L2 | 12M |

OR

| 8 | | Evaluate the generalized circuit constants for (i) short transmission line (ii) medium line nominal T method (iii) medium line nominal Π method. | L5 | 12M |

UNIT-V

R19

| 9 | a) | Derive the expression for sag and tension when the supports are at unequal heights. | L2 | 6M |
| | b) | An overhead transmission line at a river crossing is supported from two towers at heights of 50m and 100 m above water level. The horizontal distance between the towers being 500m.If the allowable tension is 1000kg, find the clearance between the conductor and water at a point mid-way between the towers. Weight of conductor is 1kg/ m. | L3 | 6M |

OR

| 10 | a) | Explain various types of insulators with neat diagrams and compare them? | L2 | 6M |
| | b) | What are the factors affecting corona? And derive the expressions for critical disruptive and visual critical voltage. | L1 | 6M |

Q.P. Code: 19EC0415

R19

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations May 2023
DIGITAL COMMUNICATION
(ECE)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

1	Derive the quantization noise and SNR of PCM.	L3	12M
	OR		
2 a)	Consider an audio signal consisting of the sinusoidal term given as $x(t) = 3\cos(500\pi t)$	L3	6M
	i) Determine the SNR noise ratio. When this is quantized using 10 bits PCM.		
	ii) How many bits of quantization are needed to achieve a SNR ratio of at least 40dB?		
b)	Explain the Process of Quantization through one Example?	L2	6M

UNIT-II

3	Derive the expression for the Nyquist criterion for distortion less baseband Transmission in the absence of noise in terms of time domain & Frequency domain.	L3	12M
	OR		
4 a)	Explain the matched filter.	L2	6M
b)	Explain in detail about Inter symbol interference and its effects?	L2	6M

UNIT-III

5 a)	Investigate on signal constellation diagram with example.	L5	6M
b)	Comment on the importance of Gram-Schmidt orthogonalization procedure in signal space analysis.	L5	6M
	OR		
6 a)	Validate the geometrical representation of signals with an example.	L5	6M
b)	Explain the concept of AWGN channel.	L2	6M

UNIT-IV

7	Draw the block diagram of QPSK transmitter & receiver and explai each block in detail.	L1	12M
	OR		
8 a)	How will you differentiate binary PSK and M-PSK, explain with block diagrams?	L2	6M
b)	Illustrate the pass band transmission model with neat diagram?	L3	6M

UNIT-V

9	For a systematic (7, 4) linear block code the sub matrix 'P' is given as $$P = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 0 \\ 1 & 0 & 1 \\ 0 & 1 & 1 \end{bmatrix}$$ (i) Find out minimum distance & weight of the code. (ii) Find the generator matrix (G).	L3	12M

Q.P. Code: 19EC0415

R19

OR

10 a)	The Generator matrix(G) for a (7, 4) block code is given below $$\begin{bmatrix} 1 & 0 & 0 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 0 & 1 & 1 & 1 \\ 0 & 0 & 1 & 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 & 0 & 1 & 1 \end{bmatrix}$$ Determine the Parity check matrix (H).	L3	6M
b)	A generator matrix for a (6, 3) block code is given below $$\begin{bmatrix} 1 & 0 & 0 & 0 & 1 & 1 \\ 0 & 1 & 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & 1 & 1 & 0 \end{bmatrix}$$ Find out minimum distance & weight of the code.	L3	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations May 2023
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)	What is an algorithm?	L1	6M
	b)	Write the For LOOP general format.	L1	6M

UNIT-II

3    $A=\begin{bmatrix} 9 & 4 & 6 & 7 \\ 7 & 8 & 1 & 4 \\ 4 & 3 & 2 & 6 \\ 5 & 3 & 0 & 2 \end{bmatrix}$ $B=\begin{bmatrix} 7 & 6 & 2 & 1 \\ 3 & 9 & 0 & 3 \\ 2 & 5 & 2 & 9 \\ 3 & 2 & 4 & 7 \end{bmatrix}$.   L6   12M

Create Stassen's matrix multiplication on A and B find the Resultant matrix.

OR

4	a)	Compare between BFS and DFS techniques.	L4	6M
	b)	Solve an algorithm for techniques of binary trees with examples.	L3	6M

UNIT-III

5	a)	Explain in detail about greedy method and its applications.	L2	6M
	b)	Simplify the algorithm for Knapsack problem and analyze time complexity.	L4	6M
		OR		
6		Analyze the minimum cost tour forgiven problem using travelling sales person Concepts.	L4	12M
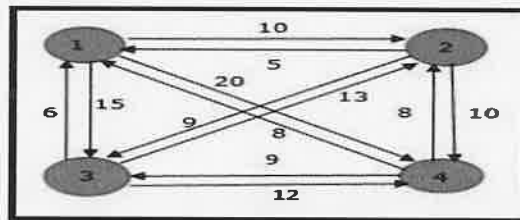
UNIT-IV

7		Select any one application of backtracking with an example.	L3	12M
		OR		
8	a)	Explain the principles of FIFO branch and bound.	L2	6M
	b)	Recall the graph coloring. Explain in detail graph coloring with an example.	L4	6M

UNIT-V

9		State and explain cook's theorem?	L2	12M
		OR		
10	a)	Define NP- hard problem.	L1	6M
	b)	What is Non-deterministic algorithm?	L1	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations May 2023
GEOTECHNICAL ENGINEERING
(CIVIL)

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

UNIT-I

1 a) Using three phase diagram of soil, develop an expression for Void ratio, water   L2   6M

   b) The moist unit weight of soil sample is 19.2 kN/m³ and has water content of 9.8%. The specific gravity of soil particles is 2.69. Determine dry unit weight, void ratio and porosity and degree of saturation.   L3   6M

OR

2 Determine the average coefficient of permeability in the horizontal and vertical direction for a deposit consisting of three layers of thickness 5m, 1m, and 2.5m and having the coefficient of permeability of 3×10^{-2}mm/sec, 3×10^{-5}mm/sec and 4×10^{-2}mm/sec respectively.   L3   12M

UNIT-II

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

OR

4 In a consolidation test the following results have been obtained. When the load was changed from 50 kN/m² to 100 kN/m², the void ratio changed from 0.70 to 0.65. Determine compression index, coefficient of volume change and coefficient of Consolidation in mm²/sec.   L3   12M

UNIT-III

5 Develop an expression for the vertical stress at a point due to a point load, using Boussinesq's theory.   L2   12M

OR

6 Explain the procedure of unconfined compression test with neat sketch.   L2   12M

UNIT-IV

7 Analyze the slope, if it is made of clay having $c' = 30$ kN/m², $\Phi' = 20°$, e = 0.65 and G=2.67 and under the following conditions:(i)When the soil is dry (ii)When water seeps parallel to the surface of the slope (iii)When the slope is submerged slope angle = 25°.   L3   12M

OR

8 a) What are the factors causes the slope failures.   L1   6M

   b) Explain different types of slope failures with neat sketches.   L1   6M

UNIT-V

9 Explain in detail how plate load Test is conducted with neat sketch.   L2   12M

OR

10 a) Explain various types of soil samples.   L2   6M

    b) List out various design features affecting the sample disturbance.   L1   6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations May 2023
CONTROL SYSTEMS
(Common to ECE & EEE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1 Using Block diagram reduction technique find the Transfer Function of the   L1   12M
   system.
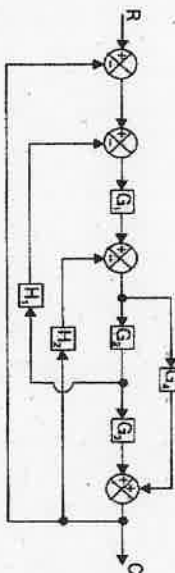
OR

2 Obtain the overall gain C(S)/R(S) from signal flow graph shown in below.   L1   12M

Fig 1
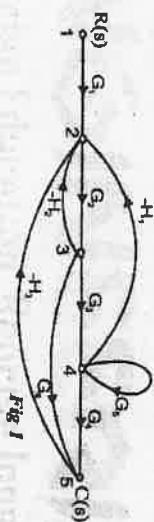
UNIT-II

3 List out the time domain specifications and derive the expressions for Rise   L1   12M
   time, Peak time and Peak overshoot.

OR

4 a) A For servo mechanisms with open loop transfer function given below   L3   6M
       what type of input signal give rise to a constant steady state error and
       calculate their values.

       $$G(s)H(s) = \frac{20(s+2)}{s(s+1)(s+3)}$$

   b) Consider a unity feedback system with a closed loop transfer function   L1   6M

       $$\frac{C(s)}{R(s)} = \frac{Ks+b}{(s^2+as+b)}$$. Calculate open loop transfer function G(s). Show that

       steady state error with unit ramp input is given by $\frac{(a-K)}{b}$.

UNIT-III

5 With the help of Routh's stability criterion determine the stability of the following   L5   12M
   systems represented by the characteristic equations:
   (a) $s^5 + s^4 + 2\, s^3 + 2\, s^2 + 3s + 5 = 0$
   (b) b) $9s^5 - 20s^4 + 10\, s^3 - s^2 - 9s - 10 = 0$

OR

6 Develop the root locus of the system whose open loop transfer function is   L3   12M
   $G(s) H(s) = \frac{K(s^2+6s+25)}{s(s+1)(s+2)}$

UNIT-IV

7 (a) Define and derive the expression for resonant frequency.   L1   6M
   (b) Develop the magnitude bode plot for the system having the following   L3   6M
        transfer function: $G(s) H(s) = \frac{2000\,(S+1)}{s(s+10)\,(s+40)}$

OR

8 Draw the Nyquist plot for the system whose transfer function is, G(s) H(s)   L5   12M
   = $\frac{k}{s(s+2)(s+10)}$. Determine the range of "K" for which closed loop
   system is stable.

UNIT-V

9 (a) Find a state model for the system whose Transfer function is given by   L3   6M

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

   (b) Find the state model of the differential equation is   L3   6M

        $$\dddot{y} + 2\,\ddot{y} + 3\,\dot{y} + 4y = u$$

OR

10 Diagonalize the following system matrix A = $\begin{pmatrix} 0 & 1 & 0 \\ 3 & 0 & 2 \\ -12 & -7 & -6 \end{pmatrix}$ L1   12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations May 2023
TRANSPORTATION ENGINEERING
(CE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1   Calculate the minimum sight distance required to avoid a head   L3   12M
    on collision of two cars approaching from opposite directions at
    90 and 60 kmph. Assume a reaction time of 2.5 seconds,
    coefficient of friction of 0.7 and a brake efficiency of 50 per cent,in
    either case.

OR

2   a)   Explain any four highway cross-sectional elements?   L1   6M
    b)   What are the engineering surveys conducted to fix the alignment L1   6M
         of a highway?

UNIT-II

3   A fixed time 2-phase signal is to be provided at an intersection   L3   12M
    having four arms. The design hour traffic and saturation flow are

	North	South	East	West
Design flow (pcu/hr) Hour	800	400	750	600
Saturation flow (pcu/hr)	2400	2000	3000	3000

OR

4   a)   Explain the various types of on-street parking patterns possible. L1   6M
    b)   Explain the various road user characteristics to be considered in L1   6M
         road design.

UNIT-III

5   a)   Differentiate flexible pavements and rigid pavements.   L1   6M
    b)   Classify different types of joints in CC pavements and mention   L1   6M
         the objects of each

OR

6   a)   What are the factors should be considered for the design of   L1   6M
         flexible and rigid pavements Discuss the significance of each.
    b)   What are the functions of tie bars and dowel bars in rigid   L1   6M
         pavements? What is the design principle?

UNIT-IV

7   Explain the role of chairs, keys and fish plates as track fitt   L1   12M
    fastenings. Support your Answer with neat sketch.

OR

8   a)   Explain the concept of creep using percussion theory.   L2   6M
    b)   Draw a typical cross section of permanent way and show various   L3   6M
         components.

UNIT-V

9   Calculate the maximum permissible speed on a curve of high speed for L3   12M
    the following data on a B.G track. Degree of curve 1.2 , amount of super
    elevation 8.0 cm, length of transition curve 125 m, maximum speed of
    the section likely sanction speed = 150 kmph.

OR

10 a)   Discuss the various components of turnouts.   L3   6M
    b)   Explain the classification of gradient in railways.   L3   6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations May 2023
ELECTRICAL MEASUREMENTS
(EEE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	Explain the construction and working of permanent magnet moving coil instruments.	L2	12M

OR

2	How do you extend the range of an Ammeter? Explain Aryton Shunt with diagram.	L3	12M

UNIT-II

3	Explain how insulation resistance of a cable can be measured with a help of Loss of charge method.	L2	12M

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	12M

UNIT-III

5	Explain the constructional details of electro dynamometer type wattmeter with a neat sketch.	L2	12M

OR

6	a)	Derive the torque equation for electro dynamo meter type wattmeter.	L2	6M
	b)	Explain stray magnetic field errors in electro dynamometer type wattmeter.	L2	6M

UNIT-IV

7	Explain the construction of (i) Current transformer (ii) Potential transformer.	L1	12M

OR

8	a)	What are the parameters to be considered in selecting a transducer for a particular application?	L2	6M
	b)	Describe the working principle of thermocouple.	L2	6M

UNIT-V

9	Describe the construction and working of a moving coil ballistic galvanometer	L2	12M

OR

10	a)	List the advantages & applications of C R O.	L2	6M
	b)	Draw a neat figure and explain the working of a C R O.	L2	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations May 2023
ELECTRONIC MEASUREMENTS AND INSTRUMENTATION
(ECE)

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

UNIT-I

1	a)	Explain about static characteristics of measuring instrument.	L2	6M
	b)	Define the terms in dynamic characteristics i) Speed of Response ii) Fidelity iii) Lag.	L1	6M

OR

2	a)	Explain and Derive the Series Type Ohmmeter.	L3	6M
	b)	A shunt type ohmmeter uses a5 mA basis D'Arsonval movement with an internal resistance of 50Ω. The battery voltage is 3V. It is desired to modify the circuits by adding appropriate shunt resistance Across the movement.so that the instrument indicates 5Ω at the midpoint scale. Calculate: i) The value of shunt resistance. ii) Value of current limiting resistance R1.	L2	6M

UNIT-II

3	Draw the block diagram of a general-purpose oscilloscope (CRO) and explain function of each block.	L2	12M

OR

4	a)	Explain with the help of block diagram, how the digital frequency and time period can be measured using counter/meter instrument .	L2	6M
	b)	Discuss in detail, the construction and working of a Trigger sweep generator.	L2	6M

UNIT-III

5	a)	Describe the diagram with operation of a harmonic distortion analyzer using Wein Bridge and frequency selective type.	L2	6M
	b)	Explain the working of a standard sweep generator with diagram.	L2	6M

OR

6	a)	Discuss in detail about pulse generator.	L2	6M
	b)	With help of a neat sketch, explain the working of any one of wave analyzer.	L2	6M

UNIT-IV

7	Explain any Two ac bridges to measure unknown Inductance	L2	12M

OR

8	a)	Compute the expression for Schering bridge circuit & write its applications.	L3	6M
	b)	An A.C bridge as the following constants Arm AB-capacitor of 0.1µF in parallel with 2KΩ resistor, Arm AD-resistance of 5KΩ, Arm BC capacitor of 0.25 µF, Arm CD-unknown capacitor CX and RX in series f-2KHz.Determine the unknown capacitance.	L3	6M

UNIT-V

9	Describe the operation of i) Resistive transducers ii)Capacitive transducers iii) Inductive transducers.	L2	12M

OR

10	a)	Explain the operation of thermocouples and thermistors.	L3	6M
	b)	Convert linear variable displacement into electrical voltage using transducer.	L2	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations May 2023
THERMAL ENGINEERING
(ME)

Time: 3 Hours

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

Max. Marks: 60

UNIT-I

| 1 | a) | Explain the working of a single stage single acting reciprocating air compressor with a neat sketch. | L2 | 6M |
| | b) | Derive the expression for work required by a single stage compressor neglecting clearance volume. | L2 | 6M |

OR

| 2 | | A single stage reciprocating air compressor is required to compressor 1 kg of air from 1 bar to 4 bar. The initial temperate is 27°C. Compare the work requirement in the following cases.
Isothermal compression
Compression with PV1.2= Const
Isentropic compression | L3 | 12M |

UNIT-II

| 3 | a) | Explain the working of a closed cycle gas turbine with the help of P-V & T-S diagrams. | L2 | 7M |
| | b) | List the merits of gas turbine over IC engines. | L2 | 5M |

OR

| 4 | | The air enters the compressor of an open cycle constant pressure gas turbine at a pressure of 1 bar and temperature of 20° C. The pressure of the air after compression is 4 bar. The isentropic efficiencies of compressor and turbine are 80% and 85% respectively. The air-fuel ratio used is 90:1. If the flow rate of air is 3 kg/s. find, (i) Power developed (ii)Thermal efficiency of the cycle. | L3 | 12M |

UNIT-III

| 5 | a) | Explain the working various types of nozzles with neat sketches | L2 | 6M |
| | b) | The dry sat steam at a pressure of 5 bar is expanded Isentropically in a convergent nozzle to a pressure of 1 bar and dryness fraction of 0.94. Find the velocity of steam at the exit of the nozzle. | L3 | 6M |

OR

| 6 | | Dry saturated steam enters a steam nozzle at a pressure of 15 bar and is discharged at a pressure of 2 bar. If the dryness fraction of discharged steam is 0.96, what will be final velocity of steam? Neglect initial velocity. If 10% of heat drop is lost in friction, find the percentage reduction in the final velocity. | L3 | 12M |

UNIT-IV

| 7 | | In a D-Lavel turbine, the steam enters the wheel through a nozzle with a velocity of 500 m/s and at an angle of 20° to the direction of motion of the blade. The blade speed is 200 m/s and the exit angle of the moving blade is 25°. Find the inlet angle of the moving blade, exit velocity of steam and its direction and work done per kg of steam. | L3 | 12M |

OR

| 8 | a) | Explain the working of an Impulse turbine through pressure and velocity diagrams. | L2 | 6M |
| | b) | List out various losses Involved in steam turbines? Explain them briefly. | L2 | 6M |

UNIT-V

| 9 | a) | Classify the IC engines based on any six categories. | L2 | 6M |
| | b) | Draw the valve timing diagram of a 4-stroke Diesel engine and explain salient features. | L2 | 6M |

OR

| 10 | | Following observations were recorded during a test on a single cylinder oil engine: Bore = 300 mm, Stroke = 450 mm, Speed = 300 rpm, IMEP = 6 bar, Net brake laod = 1.5 kN, Brake drum diameter = 1.8 m and Brake rope diameter = 2 cm. Calculate: i) Indicated power, ii) Brake power and iii) Mechanical efficiency. | L3 | 12M |

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations May 2023
SOFTWARE ENGINEERING
(CSE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	Explain how Framework activities helps to solve a problem using umbrella Activities.	L3	12M

OR

2	a)	What is Agility? Illustrate any four Agile Process Models.	L3	6M
	b)	Write a note on Agile Unified Process.	L2	6M

UNIT-II

3	List various analysis rules of thumb in requirement analysis? Discuss Domain analysis in detail.	L3	12M

OR

4	a)	Explain how to create a Behavioral Model with a use case diagram.	L2	6M
	b)	List number of problems encountered in Elicitation? Explain.	L2	6M

UNIT-III

5	a)	How to assess alternate Architectural design.	L5	6M
	b)	Identify Architectural patterns.	L5	6M

OR

6	a)	What is the Design process? Discuss software quality guidelines and attributes .	L5	6M
	b)	Explain common characteristics in the evolution of software design.	L2	6M

UNIT-IV

7	Explain the following: (i) Briefly explain about user interface design. (ii) Explain interface design workflow for WebApps.	L1	12M

OR

8	a)	Define five quality attributes of WebApp Design.	L2	6M
	b)	Discuss set of Design goals in WebApp.	L3	6M

UNIT-V

9	Explain about the importance of test strategies in conventional software.	L3	12M

OR

10	a)	Discuss the process of Art of debugging.	L3	6M
	b)	What is the need of beta testing?	L3	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations May 2023
ELEMENTS OF ROAD TRAFFIC SAFETY
(MECH,ECE,CSE)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

1   Analyze various road geometric design elements and how they are related to cause of Road accidents.   L4   12M

OR

2   a)   Explain about engineering uses in collection of accident data?   L2   6M
    b)   Explain about enforcement uses in collection of accident data?   L2   6M

UNIT-II

3   Identify various common methods in design of on-street parking with sketches.   L3   12M

OR

4   a)   List out various Traffic Laws as per Indian motor vehicle Act.   L1   6M
    b)   What are the various ill-effects of parking in detail?   L1   6M

UNIT-III

5   a)   What are the various objectives in general principles of traffic signing?   L2   6M
    b)   Briefly explain about traffic signs situation in India.   L2   6M

OR

6   a)   Briefly explain about Indication signs with neat sketch.   L1   6M
    b)   Write the conditions for placing the overhead signs.   L2   6M

UNIT-IV

7   A fixed time 2 phase signal is to be provided at an intersection having a North-South & East-West road where only straight ahead traffic is permitted. The design hour flows from various arms and the saturation flows for these arms are given: L5   12M

Type of flow	North	South	East	West
Design hour flow (q) in PCU s/hour	700	500	750	1000
Saturation flow (s) in PCU s/hour	2500	2100	3200	3200

Calculate optimum cycle time & green times for the minimum overall delay. The Intergreen time should be the minimum necessary for efficient operation. The time lost per phase due to starting delays can be assumed to be 2 seconds. The value of the amber period is 2 seconds. Sketch timing diagram for each phase.

OR

8   a)   What is meant by Signal Face, explain it with neat sketch?   L1   6M
    b)   Why co-ordination of signals is needed   L1   6M

UNIT-V

9   Explain briefly about the following terms with neat sketches:
    a) Carriageway width with reduction transition markings.   L2   12M
    b) Obstruction approach markings.

OR

10 a)   Explain briefly about commonly used Materials and Colours in road markings.   L2   6M
    b)   What is meant by pedestrian crossings and explain with neat sketch   L1   6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations May 2023
NON-CONVENTIONAL ENERGY RESOURCES
(CE,EEE,ECE)

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

UNIT-I

1		How do you classify the energy sources and brief them.	L1	12M

OR

2	a)	Define briefly about Hydro Electric Energy.	L1	6M
	b)	" Economic growth of a country depends on Energy". Justify.	L2	6M

UNIT-II

3		Explain the process of generation of power in solar pond with a neat sketch and also mention its merits and demerits.	L5	12M

OR

4	a)	Explain the process of solar photo voltaic conversion.	L2	6M
	b)	How do you convert saline water into potable water? Explain.	L2	6M

UNIT-III

5	a)	Explain briefly the functioning of Darrieus Wind Turbine.	L2	6M
	b)	Differentiate between HAWT and VAWT.	L5	6M

OR

6	a)	Discuss about Savonius wind turbine with neat sketch.	L6	6M
	b)	Explian the factors to be considered in the selection of site for wind energy.	L2	6M

UNIT-IV

7		Explain the function of Deenbandhu biogas digester with a neat sketch and also mention its merits and demerits.	L2	12M

OR

8	a)	How do you classify the gasifiers? Explain anyone in detail.	L2	6M
	b)	Classify the Biomass energy conversion systems and explain them in brief.	L3	6M

UNIT-V

9		What is tide? Explain the basic components of a tidal power plant and state their merits and demerits.	L2	12M

OR

10	a)	Explain the hydrogen production through Electrolysis process.	L2	6M
	b)	Explain the working of fuel cell and their applications.	L3	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Supplementary Examinations May 2023
ENTREPRENEURSHIP DEVELOPMENT
(CSE,ECE)

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

UNIT-I

1		Elucidate the characteristics and functions of Entrepreneurs.	L3	12M
		OR		
2	a)	Briefly explain various types of Entrepreneurs.	L3	6M
	b)	Distinguish between Entrepreneurship vs. Intrapreneurship.	L2	6M

UNIT-II

3		Discuss the need and classification of MSMEs.	L3	12M
		OR		
4	a)	Summarize the role of the Government in supporting MSMEs in India.	L2	6M
	b)	Briefly explain Sole Proprietorship, Partnership and Joint Stock Company.	L2	6M

UNIT-III

5	a)	Creativity and Innovation are interrelated or different- Comment.	L5	6M
	b)	Explain various Methods of generating ideas and Opportunities.	L5	6M
		OR		
6	a)	How many types of e-commerce businesses are there and write suitable examples.	L5	6M
	b)	What are the different sources of information for Start-up Entrepreneurship in India?	L2	6M

UNIT-IV

7		Role of government agencies in small business financing-Discuss	L1	12M
		OR		
8	a)	What is meant by Motivation? Explain Maslow's Need Hierarchy Theory in detail.	L2	6M
	b)	Construct the motivational factors influencing the entrepreneurial spirit.	L3	6M

UNIT-V

9		What are the criteria for selecting a particular project? What are the subject matters behind preliminary project report preparation?	L3	12M
		OR		
10	a)	How to write a project proposal?	L3	6M
	b)	Examine the results of the technical feasibility study	L3	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Supplementary Examinations May 2023
MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
(CIVIL)

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

UNIT-I

1	a)	Managerial economics is closely linked with many other disciplines-comment.	L5	6M
	b)	How do you measure elasticity of demand? Illustrate How you interpret the different type of elasticity.	L3	6M

OR

2	a)	What do you mean by demand forecasting?	L1	6M
	b)	Evaluate various methods of demand forecasting techniques.	L4	6M

UNIT-II

3	a)	"Economies occur as a result of increase in scale of production" comment.	L3	6M
	b)	State the dis-economies of scale.	L3	6M

OR

4	a)	State the Break-even point with graph.	L4	6M
	b)	Illuminate the BEP assumptions.	L1	6M

UNIT-III

5	a)	Explain how the price is determined in case of perfect competition.	L3	6M
	b)	Explain different methods of pricing.	L2	6M

OR

6	a)	What do you understand by economic liberalization?	L2	6M
	b)	Do you think 'privatization' is an effective measure to turn around an ailing economy such as India's?	L5	6M

UNIT-IV

7	Consider the case of the company with the following two investment alternatives each costing Rs.9 lakhs. The details of cash inflows are as follows:	L3	12M

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

Estimated the cost of capital is 10% per year. Determine NPV for the two projects

OR

8	How the discounting models differ from non- discounting models?	L5	12M

UNIT-V

9	a)	Write short notes on interest coverage ratio.	L2	6M
	b)	Explain inventory turnover ratio and debtor's turnover ratio.	L1	6M

OR

10	a)	What is meant by Ratio analysis?	L1	6M
	b)	Explain briefly about various types of ratios.	L2	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Supplementary Examinations May 2023
UTILIZATION OF ELECTRICAL ENERGY
(EEE)
Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	a)	Draw and explain the operation of sodium vapour lamp with neat diagram and enumerate its advantages and disadvantages.	L1	6M
	b)	A lamp having a uniform cp of 100 in all direction is provided with a reflector which directs 60% of the light uniformly on to a circular area of 10m diameter. The lamp is hung 5m above the area. Calculate the illumination at the center.	L2	6M

OR

2	a)	Explain with sketch the principle and operation of fluorescent lamp	L3	6M
	b)	Write short notes on flood lighting	L2	6M

UNIT-II

3	a)	What are the different types of heating? Write advantages of electric heating.	L3	6M
	b)	A low frequency induction furnace whose secondary voltage is maintained constant at 10 volts, takes 400 kW at 0.6 pf, when the hearth is full. Assuming the resistance of the secondary to vary inversely as the height of the charge and reactance to remain constant, height up to which the hearth should be filled to obtain maximum heat.	L3	6M

OR

4	a)	Briefly discuss the welding electrodes of various metals.	L2	6M
	b)	Explain briefly the types of electric arc welding.	L2	6M

UNIT-III

5	a)	What is the Classification of Electrical Drives?	L5	6M
	b)	What are the advantages and disadvantages of Electric drives?	L5	6M

OR

6	a)	What is load equalization?	L3	6M
	b)	what are the advantages of group drive?	L3	6M

UNIT-IV

7	a)	What are the special features of traction motors?	L1	6M
	b)	A goods trains weighing 300 tonnes is to be hauled by a locomotive up a gradient of 2% with an acceleration of 1 kmphps. Coefficient of adhesion is 20%. Track resistance = 45 W/Ton and effect of rotational masses is 15% of dead weight. If axle load is not to exceed by 20 tonnes, determine the weight of locomotive and number of axles.	L3	6M

OR

8	a)	Discuss the speed-time curves for main line services.	L1	6M
	b)	A train has schedule speed of 60 km/hr between the stops which are 6 km apart. Determine the crest speed over the run assuming	L1	6M

trapezoidal speed time curve. The train accelerates at 2 km/hr/sec and retards at 3 km/hr/sec. Duration of stops is 60s.

UNIT-V

9	a)	Write short notes on specific energy consumption.	L3	6M
	b)	What factors affect the specific energy consumption?	L3	6M

OR

10		An electric train of weight 250 ton has eight motors geared to driving wheels, each is 85 cm diameter. The tractive resistance is of 50/ton. The effect of rotational inertia is 8% of the train weight, the gear ratio is 4–1, and the gearing efficiency is 85% determine. The torque developed by each motor to accelerate the train to a speed of 50 kmph in 30 s up a gradient of 1 in 200.	L3	12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Supplementary Examinations May 2023
OPERATION RESEARCH
(MECH)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

1 Solve the following by using Big-M method. Maximize $Z=2X_1+3X_2+4X_3$,
Subjected to $3X_1+X_2+4X_3 \leq 600$, $2X_1+4X_2+2X_3 \geq 480$, $2X_1+3X_2+3X_3 = 540$
and $X_1, X_2, X_3 \geq 0$.   L3   12M

OR

2 a) What are the characteristics of operation Research   L1   6M
   b) Discuss the types of operation Research models   L2   6M

UNIT-II

3 Solve the following transportation problem Determine the Shipping   L3   12M
scheme by the Northwest corner Rule.

	A	B	C	D	Availabl e
P	4	6	8	13	50
Q	13	11	10	8	70
R	14	4	10	13	30
S	9	11	13	8	50
Required	25	35	105	20	

OR

4 A Department has 5 employees, and five jobs are to be performed. The   L2   6M
time each man will take to perform each job is given in the following
table below. How the job should be Allocated one per employee,
to minimize the total man-hours.

MACHINES JOBS	A	B	C	D	E
1	9	3	10	13	4
2	8	17	13	20	5
3	5	14	8	11	6
4	11	13	9	12	3
5	12	8	14	16	7

UNIT-III

5 Use the relation of Dominance to solve the game matrix.   L5   6M

		Firm B					
FirmA		B1	B2	B3	B4	B5	B6
	A1	4	2	0	2	1	1
	A2	4	3	1	3	2	2
	A3	4	3	7	-5	1	2
	A4	4	3	4	-1	2	2
	A5	4	3	3	-2	2	2

OR

6 a) What is Queuing Theory? List and explain the elements of Queuing   L1   6M
system?
   b) Discuss the following i) Server ii) Arrival rate iii) Service rate   L2   6M

UNIT-IV

7 A project has the following schedule. Construct PERT network and   L3   12M
compute the total float for each activity. Find critical path with its
duration.

Activity	Time in mont h	Activity	Time in month	Activity	Time in month
1-2	2	3-6	8	6-9	5
1-3	2	3-7	5	7-8	4
1-4	1	4-6	3	8-9	3
2-5	4	5-8	1		

OR

8 a) Explain the Forward Pass computations for Earliest Event Time in detail.   L2   6M
   b) Discuss the Backward pass computations for Latest Allowable Time in detail.   L2   6M

UNIT-V

9 A truck owner from his past records that the maintenance costs per year   L5   12M
of a truck whose Purchase price is Rs.8000 are as given below. When
should the machine be replaced?

Year (n)	1	2	3	4	5	6	7	8
Running cost MC in Rs.	1000	1300	1700	2000	2900	3800	4800	6000
Resale Price(Rs)	4000	2000	1200	600	500	400	400	400

OR

10 a) What are the sequential steps involved in sequencing jobs?   L3   6M
    b) Discuss briefly about Individual Replacement model.   L3   6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Supplementary Examinations May 2023
FOUNDATION ENGINEERING
(CE)
Time: 3 Hours   Max. Marks: 60
Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

1	A cantilever retaining wall of 7mts height retains sand. The properties of sand are e=0.5, φ=300 and G=2.7m. Using Rankine's theory Determine the active earth pressure at the base when the backfill is (i) dry (ii) saturated (iii)submerged and also the resultant active force in each case.	L3	12M

OR

2	With the help of neat sketch explain design of gravity retaining walls.	L2	12M

UNIT-II

3	Discuss the various methods of determination of allowable soil pressure in cohesion less soils?	L2	12M

OR

4	a)	With neat sketches explain different types of shear failures.	L2	6M
	b)	Determine the ultimate bearing capacity of a strip footing, 1.20 m wide, and having the depth of foundation of 1.0 m. Use Terzaghi's theory and assume general shear failure. Take φ = 35o, γ = 18 kN/m3, and C' = 15 kN/m2. Take (Nc=57.8, Nγ=42.4, Nq=41.4).	L3	6M

UNIT-III

5	a)	A 30cm diameter concrete pile is driven into a homogeneous consolidated clay deposit (cu=40kN/m2, α=0.7). If the embedded length is 10m, estimate the safe load (F.S. =2.5).	L3	6M
	b)	A square concrete pile (30cm side) 10 m long is driven into coarse sand (γ=18.5 kN/m3, N=2.0). Determine the allowable load (F.S. =3.0).	L2	6M

OR

6	Explain settlement of pile groups in (a) cohesion less soils (b) cohesive soils.	L2	12M

UNIT-IV

7	Describe the various components of pneumatic caisson with the help of neat sketch.	L2	12M

OR

8	What are the advantages and disadvantages of Floating caisson and discuss stability of floating caisson during flotation?	L1	12M

UNIT-V

9	Explain the pressure distribution and stability of free cantilever sheet pile with neat sketch.	L3	12M

OR

10	What are different anchors used in sheet pile walls? Explain the design of anchor pates and beams with neat sketch.	L2	12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B. Tech IV Year I Semester Supplementary Examinations May 2023
ELECTRICAL DISTRIBUTION SYSTEMS
(EEE)

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

UNIT-I

1 Draw a schematic single line diagram of an electrical distribution   L3   12M
   system and explain its typical parts in detail.

OR

2 A generating station has a maximum demand of 20MW, a load factor of 60%, a L3   12M
   plant capacity factor of 50% and a plant use factor of 72%. Find (i) the reserve
   capacity of the plant (ii) the daily energy produced and (iii) maximum energy
   that could be produced daily if the plant while running as per schedule, were
   fully loaded.

UNIT-II

3 Derive the expression for power factor referred to receiving end Voltage in L3   12M
   A.C. distributor with vector diagram.

OR

4 A 2 wire DC distributor cable AB is 2 KM long supplies loads of 100A,150A,200A and L2   12M
   50A situated 500m,1000m,1600m and 2000m from the feeding point A. Each
   conductor has a resistance of 0.01ohm per 1000m.calculate potential difference at
   each load point if a potential difference of 300V is maintained at point A.

UNIT-III

5 Explain the classification of Substations?   L5   12M

OR

6 Draw the layout and schematic connection Underground Sub Station?   L5   12M
   Give the advantages and Disadvantages.

UNIT-IV

7 A single phase A.C. Generator supplies the following loads: L1   12M
   (i) Lighting load of 20 kW at unity power factor.
   (ii) Induction motor load of 100 kW at P.F. 0.707 lagging. (iii)Synchronous
   motor load of 50 kW at P.F 0.9 leading. Calculate the total KW and KVA
   delivered by the generator and the power factor at which it works.

OR

8 a) Define power factor? explain voltage and current relationship for different L2   6M
      loads.
   b) Explain Phase advancers.   L3   6M

UNIT-V

9 Explain distribution automation? Give the various functions of distribution L3   12M
   automation.

OR

10 a) What are the fundamental requirements of communication infrastructure?   L3   6M
   b) what are the communication methods?   L3   6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Supplementary Examinations May 2023
MODERN MACHINING METHODS
(MECH)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1		Analyze the effects of the following parameters on MRR as applied to the Ultrasonic Machining Process (USM).Amplitude & Frequency of Vibrations, Grain Size Applied Static Load Effect of Slurry.	L3	12M

OR

2	a)	Discuss the Modern Machining Methods with their advantages in the current industry.	L3	6M
	b)	Differentiate between Traditional and Non-Traditional Machining Processes.	L2	6M

UNIT-II

3		With a Neat Sketch Explain the parts and working principle of EDM (Electrical Discharge machining).	L2	12M

OR

4	a)	List out the Parameters that effect EDG and limitations.	L2	6M
	b)	What are the functions of dielectric fluid in EDM (Electrical Discharge Machining).	L2	6M

UNIT-III

5	a)	Explain the working principle of Electro Chemical Machining (ECM) process.	L5	6M
	b)	List out the major techniques used in the Chemical machining process.	L2	6M

OR

6	a)	Explain the working principle of the Electro Chemical Grinding (ECG) process with a schematic diagram.	L1	6M
	b)	Write a short note on electrochemical honing (ECH) and the tool construction process.	L2	6M

UNIT-IV

7		Draw the schematic layout of the Electron Beam Machining (EBM) set-up and explain the major parts in it.	L1	12M

OR

8	a)	Write the advantages, disadvantages, applications of Plasma Arc Machining (PAM).	L2	6M
	b)	Explain the parts of Laser Beam Machining (LBM) briefly.	L3	6M

UNIT-V

9		Explain about Nanofabrication Techniques- Scanning Probe Technique with neat diagram.	L3	12M

OR

10	a)	Discuss about the Micro Fabrication Technique-Doping.	L1	6M
	b)	Discuss briefly on microfabrication techniques used in Industrial sectors.	L2	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Supplementary Examinations May 2023
WIRELESS COMMUNICATIONS
(ECE)

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

UNIT-I

1	a)	Write briefly about evolution of mobile radio communication system.	L2	6M
	b)	Explain the two full duplex systems in wireless communication systems.	L2	6M

OR

2	a)	Explain third generation wireless networks.	L2	6M
	b)	Illustrate a mobile handoff scenario at the cell boundary while a conversation is in progress.	L3	6M

UNIT-II

3	a)	Explain about any one of the path loss models.	L2	6M
	b)	Derive the relation between vertical and horizontal field components at a dielectric boundary in matrix form.	L3	6M

OR

4	a)	Illustrate with diagram of Fresnel zones for different knife-edge diffraction scenarios?	L3	6M
	b)	Explain radar cross section model.	L2	6M

UNIT-III

5	a)	Explain parameters of mobile multipath channels and time dispersion parameters.	L2	6M
	b)	Describe the factors influencing small scale fading in the radio propagation channel.	L2	6M

OR

6	a)	Explain briefly the types of small scale fading.	L2	6M
	b)	Summarize the relation between the various multipath parameters and the type of fading experienced by the signal.	L2	6M

UNIT-IV

7	a)	Briefly explain the equalizers in a communication receiver.	L2	6M
	b)	Explain Maximum likelihood sequence estimation (MLSE) Equalizer.	L2	6M

OR

8	a)	Derive an expression for selection diversity improvement.	L3	6M
	b)	Explain about maximal ratio combining and equal gain diversity.	L2	6M

UNIT-V

9	a)	Describe the features of time division multiple access (TDMA) scheme.	L2	6M
	b)	Explain various hybrid spread spectrum techniques in CDMA.	L2	6M

OR

10	a)	Differentiate between Pure ALOHA and slotted ALOHA.	L4	6M
	b)	Derive the expression for capacity in fading channels.	L3	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Supplementary Examinations May 2023
CONCRETE TECHNOLOGY
(CIVIL)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

1	Define the term "Bulking of aggregates". Explain its significance with reference to concrete making. Explain the simple field test to determine the bulking of aggregates.	L3	12M

OR

2	a)	How would you grade the aggregates by conducting sieve analysis on aggregates in laboratory? Explain the procedure with appropriate table.	L3	6M
	b)	What is alkali-aggregate reaction? And how will it affect the concrete properties.	L2	6M

UNIT-II

3	Explain the relation between compression strength and tensile strength of concrete.	L3	12M

OR

4	a)	Explain the procedure for determination of flexural strength of hardened concrete.	L2	6M
	b)	What is curing? What are the different methods of curing	L2	6M

UNIT-III

5	Explain in detail about the rebound hammer test (NDT) that is conducted on existing structure to assess its strength with a neat diagram.	L5	12M

OR

6	a)	Explain the various factors affecting shrinkage of concrete	L5	6M
	b)	What are the factors that affect the creep and shrinkage of concrete?	L2	6M

UNIT-IV

7	How would you improve the quality of concrete by doing surface treatment. Explain with appropriate examples.	L1	12M

OR

8	a)	Explain briefly about chloride attack on concrete	L2	6M
	b)	Write and explain the effects of materials on durability.	L3	6M

UNIT-V

9	Design a concrete mix of M35 grade for a roof slab. Take a standard deviation of 5.0. The specific gravities of Coarse Aggregate and Fine Aggregate are 2.67 and 2.73 respectively. The bulk density of coarse aggregate is 16020 Kg/m3 and Fineness Modulus of Fine Aggregate is 2.76. A slump of 75mm is necessary. The water absorption of coarse aggregate is 1% and free moisture in fine aggregate is 3%. Design the concrete mix using ACI method. Assume any missing data suitably.	L3	12M

OR

10	a)	Explain the mix design procedure of concrete as per ACI code Method.	L3	6M
	b)	Briefly discuss various methods of the mix design available in literature.	L3	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Supplementary Examinations May 2023
POWER QUALITY
(EEE)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

1		What are the responsibilities of end users and suppliers of electric power supply?	L3	12M

OR

| 2 | a) | What is meant by dc offset and What is meant by surge? | L3 | 6M |
| | b) | What are the power quality standards? | L2 | 6M |

UNIT-II

| 3 | | What are the conventional devices available for the voltage regulation? | L3 | 12M |

OR

| 4 | a) | What are the sources of transient over voltages? | L2 | 6M |
| | b) | What are the principles of over voltage protection? | L2 | 6M |

UNIT-III

| 5 | a) | Explain harmonic distortion evaluation procedure? | L5 | 6M |
| | b) | Explain the principles of controlling harmonics. | L5 | 6M |

OR

| 6 | a) | What are the harmonics sources from commercial loads? | L5 | 6M |
| | b) | Explain the brief description about the harmonic distortion evaluation. | L2 | 6M |

UNIT-IV

| 7 | | Explain the applications for system maintenance, operation and reliability. | L1 | 12M |

OR

| 8 | a) | Write a short note on power quality monitoring standards. | L2 | 6M |
| | b) | Explain about smart power quality monitors. | L3 | 6M |

UNIT-V

| 9 | | What are the advantages of static var compensators? Discuss the operation of Static Series Compensators? | L3 | 12M |

OR

| 10 | a) | Draw and explain the schematic diagram of a right shunt UPQC? | L3 | 6M |
| | b) | Explain the principle of DVR operation used for sag mitigation? | L3 | 6M |

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Supplementary Examinations May 2023
AUTOMOBILE ENGINEERING
(MECH)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	a)	With a neat sketch, explain in detail about the Rear wheel drive in automobiles	L2	6M
	b)	List any three components of an I.C engine and explain their functions	L4	6M

OR

2	a)	Classify the different types of combustion processes	L6	6M
	b)	Explain in detail about different types of Automobiles.	L2	6M

UNIT-II

3	a)	Explain the various needs of alternative fuels	L2	6M
	b)	What are the various types of alternate fuels available and mention their importance?	L1	6M

OR

4	a)	State the necessity of Engine cooling system	L1	6M
	b)	What is meant by Engine cooling system? List out the different types of Cooling systems used in Engines	L1	6M

UNIT-III

5	a)	What is the function of Engine Lubrication?	L1	6M
	b)	List the properties of Engine lubricants	L2	6M

OR

6	a)	Write the uses of various components used in Horn System.	L1	6M
	b)	State the necessity of Bendix Drive in Automobiles	L2	6M

UNIT-IV

7		Explain in details about Differential used in automobile with neat diagram.	L2	12M

OR

8	a)	Explain in details about Rear Axle with neat diagram	L2	6M
	b)	Discuss in detail about propeller shaft	L2	6M

UNIT-V

9		Briefly explain about the Davi's Steering Mechanism with neat sketch	L3	12M

OR

10	a)	Elucidate about Torque Bar	L2	6M
	b)	Discuss about shock absorber in detail	L2	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Supplementary Examinations May 2023
EMBEDDED SYSTEMS AND IOT
(ECE)

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

UNIT-I

1		Explain the role of following circuitry in embedded system	L2 12M
		i) Reset Circuit ii) Real Time Clock iii) Watchdog Timer	

OR

2	a)	Explain in brief about the programming languages used for the development of Embedded systems	L2 6M
	b)	Explain the following interfaces:	L1 6M
		i) IEEE1394 ii) IrDA iii) Bluetooth	

UNIT-II

3		Describe how the environment can be more protected with the help of IoT technology in the following categories:	L2 12M
		(i) Air pollution monitoring (ii) Noise pollution monitoring	
		(iii) Forest fire detection (iv) River flood detection	

OR

4	a)	Classify the protocols associated with network/internet layer of IoT.	L2 6M
	b)	Explain the various link layer protocols of IoT.	L2 6M

UNIT-III

5	a)	Develop a program for LCD and Keyboard programming interface for an Arduino.	L3 6M
	b)	Construct a program in Arduino to work as a counter.	L3 6M

OR

6	a)	Describe the structure of Network function Virtualization for IoT.	L2 6M
	b)	Explain the key elements of Network function Virtualization for IoT.	L2 6M

UNIT-IV

7		Describe the following steps involved in IoT system design methodology:	L2 12M
		(i) Information model Specification (ii) Service Specifications	

OR

8	a)	Describe the packages used in python.	L2 6M
	b)	Explain the function with default arguments, passing by reference, keyword Arguments and variable length arguments with an example each.	L2 6M

UNIT-V

9	a)	With the help of neat diagram explain the basic building blocks of IoT device.	L2 6M
	b)	Justify how Raspberry Pi is different from a desktop computer.	L4 6M

OR

10	a)	Illustrate how to interface a Light sensor (LDR) with Raspberry Pi.	L3 6M
	b)	Design an automatic lightening system with LDR, Light and Raspberry Pi and write a python program to support the working of that design.	L3 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Supplementary Examinations May 2023
VLSI DESIGN
(ECE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1		Illustrate the steps involved in NMOS fabrication process with neat sketches.	L3	12M

OR

2	a)	Derive the expression for threshold voltage for MOS transistors.	L3	6M
	b)	Explain in detail about Transconductance.	L2	6M

UNIT-II

3		Illustrate design rules for wires and MOS transistors. Also, Construct stick diagram for $Y = (AB + CD)$ in NMOS design style.	L3	12M

OR

4	a)	Summarize 2μm based design rules with neat sketches.	L2	6M
	b)	Draw the layout diagram for 2-input CMOS NAND gate.	L2	6M

UNIT-III

5	a)	Evaluate the CMOS implementation of 4X1 mux using transmission gates?	L5	6M
	b)	Evaluate the Power Estimation in CMOS circuit.	L5	6M

OR

6	a)	Interpret pseudo NMOS logic using an example	L5	6M
	b)	Explain the implementation of AOI using CMOS design style with neat sketches.	L2	6M

UNIT-IV

7		Write a short on the following. (i) Unsigned magnitude comparator.(ii) Asynchronous Counters.	L1	12M

OR

8	a)	Differentiate Comparator and Magnitude Comparator with example.	L2	6M
	b)	Construct and explain the circuit diagram of 3-bit LFSR with example.	L3	6M

UNIT-V

9		Design the following functions in PLA structure. (i) Y1=A'B'C'+ABC+A'B+ABC' (ii) Y2=ABC+A'B'C+AC (iii) Y3=A'BC'+AB'C+B'C'	L3	12M

OR

10	a)	By using suitable logic circuit, categorize stuck-at-'1' fault and stuck-at-'0' faults.	L3	6M
	b)	Illustrate controllability and observability with suitable examples.	L3	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Supplementary Examinations May 2023
POWER PLANT ENGINEERING
(ME)

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

UNIT-I

1		Explain the layout of steam power plant with neat sketch.	L2	12M
		OR		
2	a)	Define demand factor and diversity factor.	L1	6M
	b)	What is meant by load curve? Explain its importance in power generation.	L2	6M

UNIT-II

3		Explain with a neat diagram the process of coal handling from coal mines to combustion chamber.	L2	12M
		OR		
4	a)	Examine the pollutants and methods used to measure them.	L2	6M
	b)	Illustrate the working of an electrostatic precipitator.	L2	6M

UNIT-III

5		Explain the working of a diesel power plant with a neat sketch.	L2	12M
		OR		
6		List out the advantages and disadvantages of combined cycle power plant.	L3	12M

UNIT-IV

7		Explain the need for flow measurement and the methods for flow measurement.	L2	12M
		OR		
8		Explain governing mechanism of turbines with a neat sketch.	L2	12M

UNIT-V

9		Explain a nuclear reactor with neat diagram.	L2	12M
		OR		
10		Draw a fast breeder reactor and explain.	L2	12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Supplementary Examinations May 2023
ENVIRONMENTAL IMPACT ASSESSMENT AND MANAGEMENT
(CE)

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

UNIT-I

1		Explain in detail about EIA Procedure?	L2	12M

OR

| 2 | a) | Write in detail about the impact evaluation and analysis. | L1 | 6M |
| | b) | What are the analytical functions associated with the EIA? | L1 | 6M |

UNIT-II

3		Discuss in detail about the criteria for the selection of EIA methodology.	L2	12M

OR

| 4 | a) | Write short notes on matrix method. | L1 | 6M |
| | b) | Make a note on impact interpretation and evaluation. | L3 | 6M |

UNIT-III

| 5 | a) | List the conceptual approach to study surface water environment impacts. | L4 | 6M |
| | b) | What are the physical and chemical characteristics of water? Brief it. | L1 | 6M |

OR

| 6 | a) | With flow chart, mention the area and point sources of air pollution. | L1 | 6M |
| | b) | List the WHO and CPCB standards on air quality. | L3 | 6M |

UNIT-IV

7		Explain about the regulatory mitigation measures for the mitigation of biological impacts?	L2	12M

OR

| 8 | a) | Make a note on noise measurement. | L2 | 6M |
| | b) | With a table format, mention the OSHA noise exposure limits for the work environment. | L2 | 6M |

UNIT-V

9		Define the Wild life act and its implementations.	L1	12M

OR

| 10 | a) | Prepare the environmental impact of land clearing project in upland forest giving priority to physical resources. | L3 | 6M |
| | b) | Write short notes on water act. | L3 | 6M |

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Supplementary Examinations May 2023
POWER SEMICONDUCTOR DRIVES
(EEE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

| 1 | For firing angle α=90°, draw voltage and current waveforms of 3-Ø semi converter fed by DC series motor | L5 | 12M |

OR

| 2 | With neat diagram, explain 1-Ø fully controlled converter fed by separately excited motor in continuous conduction mode. | L4 | 12M |

UNIT-II

| 3 | A 400V,750 rpm,70A,dc shunt motor has an armature resistance of 0.3Ω, when running under rated condition ,the motor is to be braked by plugging with armature current limited to 90A .what external resistance should be connected in series with the motor .calculate the initial braking torque and its value when the speed is increased to 300 rpm. | L3 | 12M |

OR

| 4 | a) | Draw and explain operation of current limit control. | L2 | 6M |
| | b) | Draw and explain operation of torque control by using closed loop control of DC Drives. | L2 | 6M |

UNIT-III

| 5 | a) | A separately excited dc motor with armature resistance of 0.02Ω with dc supply 220V,100A,1000rpm is fed with chopper control for its motoring and braking operations. Assuming continuous conduction calculate (i) the duty ratio of the chopper at rated torque with speed of 400 rpm for its motoring operation (ii) the duty ratio of the chopper at rated torque with speed of 400 rpm for its braking operation. | L3 | 6M |
| | b) | Explain the closed loop speed control of dc motor and show how it can be achieved by a chopper. | L5 | 6M |

OR

| 6 | Discuss the operation of motoring & regenerative braking of series excited DC motor? | L2 | 12M |

UNIT-IV

| 7 | a) | Explain stator- frequency control method? | L2 | 6M |
| | b) | A 3-Ø, 400V,50Hz,6 pole star connected induction motor has the following parameters (referred to stator): R1=R2=0.12Ω,X1=X2=0.6Ω,determine the initial braking torque if the motor is braked by plugging the full load the slip is 0.02. | L3 | 6M |

OR

| 8 | Explain why the static Kramer drive can't be used for high speed ranges with neat sketch. | L4 | 12M |

UNIT-V

| 9 | Discuss using a block diagram the operation of a voltage source inverter fed synchronous motor in the true synchronous mode. | L2 | 12M |

OR

| 10 | a) | Explain the operation of self - control of synchronous motor. | L2 | 6M |
| | b) | Discuss the operation of separate -control of synchronous motor. | L2 | 6M |

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Supplementary Examinations May 2023
DIGITAL IMAGE PROCESSING
(ECE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	a)	Discuss the method for representation of a digital image.	L2	6M
	b)	Explain the image sampling and quantization process with proper steps.	L2	6M

OR

2	a)	Compute the array product and matrix product for the following two images and comment the result. $A = \begin{bmatrix} 1 & -1 \\ -1 & 1 \end{bmatrix} \& B = \begin{bmatrix} 2 & -2 \\ -2 & 2 \end{bmatrix}$	L3	6M
	b)	Illustrate the adjacency, connectivity, regions and boundaries.	L2	6M

UNIT-II

3	a)	Compute 2D – Discrete Fourier Transform for the following image. $f(x,y) = \begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \end{bmatrix}$	L3	6M
	b)	Prove the Separable property of 2D – Discrete Fourier Transform.	L4	6M

OR

4	a)	Evaluate Walsh transform for the given image. $f(m, n) = \begin{bmatrix} 2 & 4 \\ 2 & 5 \end{bmatrix}$	L4	6M
	b)	Estimate the basis matrix of Walsh Transform for N = 4.	L2	6M

UNIT-III

5	a)	Give the importance of the Color Models and explain the RGB models	L1	6M
	b)	Discuss the smoothing filters in frequency domain along with the required expressions.	L2	6M

OR

6	a)	Explain the procedure for histogram process and uses of histogram.	L2	6M
	b)	Illustrate the contrast stretching in image enhancement with suitable example.	L2	6M

UNIT-IV

7	a)	Give the importance of image segmentation in image processing.	L1	6M
	b)	Explain the method of inverse filtering for image restoration.	L2	6M

OR

8	a)	Discuss the concept of Laplacian of Gaussian (LoG) operator for edge detection.	L2	6M
	b)	Explain the concept of Watershed transform for image segmentation.	L2	6M

UNIT-V

9	a)	Justify Huffman coding is a uniquely decodable coding	L4	6M
	b)	Apply Huffman coding for the following probabilities.	L3	6M

Symbol	a_1	a_2	a_3	a_4	a_5	a_6
Probability	0.1	0.4	0.06	0.1	0.04	0.3

OR

10	a)	Summarize the procedure of Bit plane coding with suitable example.	L2	6M
	b)	Compare the adaptive transform coding and non- adaptive transform coding.	L2	6M

Estimate Compression ratio and Redundancy.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Supplementary Examinations May 2023
MECHATRONICS & ROBOTICS
(MECH)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1		List out the displacement transducers. Explain with neat sketch any one of displacement transducer.	L3	12M

OR

| 2 | a) | Illustrate the open loop control system with neat sketch in detail. | L3 | 6M |
| | b) | List the various benefits and applications of mechatronics. | L2 | 6M |

UNIT-II

3		Illustrate the characteristics of actuator.	L2	12M

OR

| 4 | a) | What are the mechanical actuation system functions? | L2 | 6M |
| | b) | What is filter? Classify the filters in detail. | L3 | 6M |

UNIT-III

5		List the different types of joints used in robots with neat sketch.	L4	12M

OR

| 6 | a) | What is degree of freedom? Briefly explain it. | L5 | 6M |
| | b) | Classify robots based on the configurations with neat diagrams | L4 | 6M |

UNIT-IV

7		Briefly explain the D-H notation joint coordinates with diagram.	L2	12M

OR

| 8 | a) | Summarize the steps involved in trajectory planning | L2 | 6M |
| | b) | Describe the principle of Reverse transformation | L3 | 6M |

UNIT-V

9		Define Robot program. What is the purpose of it and what are the various methods used for programming robots?	L3	12M

OR

| 10 | a) | Illustrate the installation steps of robot programming | L2 | 6M |
| | b) | Discuss the various applications of robot | L2 | 6M |

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Supplementary Examinations May 2023
DATA SCIENCE
(CSE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	a)	Explain in detail each stages of Data Analytics Lifecycle.	L2	8M
	b)	Define dirty data.	L1	4M

OR

2	a)	Illustrate the importance of visualizing data before analysis.	L2	6M
	b)	Describe the Array function in R.	L2	6M

UNIT-II

3		Suppose everyone who visits a retail website gets one promotional offer or no promotion at all. We want to see if making a promotional offer makes a difference. What statistical method would you recommend for this analysis?	L5	12M

OR

4	a)	Give the difference between Validation and Testing?	L4	6M
	b)	How evaluations of Candidate Rules are done?	L2	6M

UNIT-III

5	a)	Discuss confusion matrix with suitable example.	L1	6M
	b)	Describe Decision Tree in detail with example..	L2	6M

OR

6		Discuss the following with respect to linear regression.	L2	12M

         a. Categorical Variables.
         b. Confidence Intervals on the Parameters
         c. Confidence Intervals on the Expected Outcome
         d. Prediction Interval on a Particular Outcome

UNIT-IV

7	a)	List and explain time series components.	L1	6M
	b)	Discriminate the steps involved in Box-Jenkins Methodology.	L5	6M

OR

8	a)	What is meant by k-means?	L1	4M
	b)	Describe k-means algorithm to find k clusters.	L2	8M

UNIT-V

9	a)	Define TFIDF.	L1	4M
	b)	Describe the usage of TFIDF to compute the usefulness of each word in the texts.	L2	8M

OR

10	a)	Sketch flow diagram of Text analysis process.	L5	6M
	b)	Illustrate in detail the steps involved in the process of Text analysis done by organizations.	L3	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Supplementary Examinations May 2023
FIBER OPTIC COMMUNICATIONS
(ECE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	Explain the Elements of Optical Communication System with neat sketch.	L3	12M

OR

2	Describe in detail about (i) Single mode and (ii) Multimode fibers.	L3	12M

UNIT-II

3	a)	Illustrate the working principle of an edge emitter LED with neat diagram.	L3	6M
	b)	List the advantages and disadvantages of LED.	L2	6M

OR

4	a)	Illustrate about external quantum efficiency of LASER.	L2	6M
	b)	Compute the rate equation for LASER diode.	L2	6M

UNIT-III

5	a)	Explain about avalanche multiplication noise in APD diode.	L5	6M
	b)	Summarize the comparisons of photo detectors	L5	6M

OR

6	a)	Illustrate how noises are entered into photo detector.	L5	6M
	b)	Analyze photo detector receiver with simple model and equivalent circuit.	L2	6M

UNIT-IV

7	a)	What is bandwidth budget?	L1	6M
	b)	Describe about power budget with examples	L3	6M

OR

8	a)	Summarize on system performance using rise time budget of digital systems.	L2	6M
	b)	Explain the significance of system consideration in point-to-point fiber links.	L3	6M

UNIT-V

9	Explain in detail about Optical network topologies	L3	12M

OR

10	Explain in detail about wave length routed networks.	L3	12M