

UNIT-I

1 a) Reduce the matrix $A = \begin{bmatrix} 1 & 2 & 1 \\ -1 & 0 & 2 \\ 2 & 1 & -3 \end{bmatrix}$.

L3 6M

b) Find whether the following system of equations is consistent if so solve $x + y + 2z = 4$; $2x - y + 3z = 9$; $3x - y - z = 2$.

L3 6M

OR

2 Verify Cayley-Hamilton theorem for the matrix $A = \begin{bmatrix} 1 & -2 & 2 \\ 1 & 2 & 3 \\ 0 & -1 & 2 \end{bmatrix}$ and hence find A^{-1} .

L3 12M

UNIT-II

3 a) State Rolle's theorem and hence verify it for the function

L3 6M

$f(x) = \log \left[\frac{x^2 + ab}{x(a+b)} \right]$ in $[a, b]$, $a > 0, b > 0$.

b) Expand \log_2 in powers of $(x-1)$ and hence find \log_2 correct up to 4 decimal places.

L3 6M

OR

4 a) If $x = r \cos \theta$, $y = r \sin \theta$, find $J \left(\begin{matrix} x, y \\ r, \theta \end{matrix} \right)$.

L2 6M

b) Discuss the maxima and minima of the function $f(x, y) = x^3 y^2 (1 - x - y)$.

L2 6M

UNIT-III

5 a) Evaluate $\int_0^1 \int_0^z e^x dy dx$.

L5 6M

b) Evaluate $\int_{-1}^1 \int_0^{z+x} \int_0^{z+x} (x+y+z) dx dy dz$.

L5 6M

OR

6 Change the order of integration in $I = \int_0^{1-x} \int_0^x xy dy dx$ and hence evaluate.

L5 12M

UNIT-IV

7 a) Find the directional derivative of $2xy + z^2$ at $(1, -1, 3)$ in the direction of a vector $i + 2j + 3k$.

L3 6M

b) Show that $\vec{F} = (x + 3yz)i + (y - 2xz)j + (5xy - 2z)k$ is a solenoid vector.

L3 6M

OR

8 Define curl of a vector point function. Show that the vector point function $\vec{F} = (x^2 - yz)i + (y^2 - xz)j + (z^2 - xy)k$ is irrotational and hence find its scalar potential.

L3 12M

UNIT-V

9 a) If $\vec{F} = (5xy - 6x^2)j + (2y - 4x)i$, evaluate $\int_C \vec{F} \cdot d\vec{r}$ along the curve $y = x^2$ in xy -plane from $(1, 1)$ to $(2, 8)$.

L3 6M

b) Evaluate $\int_S \vec{F} \cdot \vec{n} ds$ where $\vec{F} = 12x^2 yj - 3yzj + 2zk$ and S is the portion of the plane $x + y + z = 1$ located in the first octant.

L3 6M

OR

10 Verify Green's theorem for $\oint_C [(2x^2 - y^2)dx + (x^2 + y^2)dy]$ where C is the curve enclosed by the x -axis and upper half of the circle $x^2 + y^2 = a^2$.

L3 12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech I Year I Semester Regular & Supplementary Examinations March - 2023

APPLIED PHYSICS
(CSE, CAD, CIA & CSM)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

- 1 a) Define interference and summarizing the important conditions to get sustained interference. L2 4M
b) Explain the theory of Newton's rings. L3 8M

OR

- 2 a) Define diffraction? Distinguish between Fraunhofer and Fresnel's diffraction. L3 4M
b) Explain Fraunhofer diffraction due to single slit and derive the conditions for principal maxima, secondary maxima and minima. L2 8M

UNIT-II

- 3 a) Define the following electrical properties of a metal (i) Drift Velocity (ii) Mean free path (iii) Relaxation time L1 6M
b) Derive an expression for electrical conductivity in a metal by Quantum free electron theory. L4 6M

OR

- 4 a) Classify the solids into conductors, semiconductors and insulators based on band theory of solids. L2 6M
b) State and Explain Gauss's theorem for divergence. L2 6M

UNIT-III

- 5 a) Define laser and describe the important characteristics of a laser beam. L2 4M
b) Describe the construction and working principle of He-Ne Laser with the help of a neat diagram. L2 8M

OR

- 6 a) Explain about Step index and Graded index optical fibers. L4 8M
b) An optical fiber has a core and cladding refractive index of 1.44 and 1.40. Find its Numerical Aperture and Acceptance angle. L3 4M

UNIT-IV

- 7 a) Explain about P-type and N-type extrinsic semiconductors. L3 8M
b) Enumerate the expression for intrinsic carrier concentration. L2 4M

OR

- 8 a) Explain the expression for Einstein's relation. L2 8M
b) Explain the formation of P-N junction. L2 4M

UNIT-V

- 9 a) Explain the Type-I and Type-II superconductors. L2 8M
b) Write the properties of superconductors. L2 4M

OR

- 10 a) Explain Ball milling technique for synthesis of nanomaterials. L2 8M
b) Explain the applications of nanomaterials in different fields. L1 4M

APPLIED CHEMISTRY

(EEE & ECE)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

- 1 a) Write short note on Hydrogen-Oxygen fuel cell. L2 6M
b) Explain about Potentiometric redox titrations L2 6M

OR

- 2 a) What is primary Battery? Write a brief note on Zinc-Air battery. L1 6M
b) Write a short note on Ni-Cd (NICAD) battery. L2 6M

UNIT-II

- 3 a) Explain π - molecular orbital of Benzene with a neat sketch. L2 8M
b) Differentiate bonding and anti-bonding molecular orbitals. L3 4M

OR

- 4 a) Explain the salient features of Crystal Field Theory. L2 6M
b) Write short notes on Wave-Particle duality of matter L2 6M

UNIT-III

- 5 a) Define polymerization? Write the types of polymerizations with examples L2 8M
b) What are conducting polymers? How are they classified? L1 4M

OR

- 6 a) Write the synthesis and engineering applications of Poly acetylene Conducting polymer L2 8M
b) Describe the preparation, and uses of Bakelite L3 4M

UNIT-IV

- 7 a) Write a short note on Beer-Lambert's Law L2 6M
b) Describe the methods of separation Gaseous mixture. L2 6M

OR

- 8 Explain the working principle and instrumentation of Atomic Absorption Spectrometer (AAS). L2 12M

UNIT-V

- 9 a) Write the Properties of Nano materials L2 6M
b) Define Dielectric materials. Write the good characteristics of dielectrics. L1 6M

OR

- 10 a) Define Super conductors. L1 2M
b) Discuss about the principle and application of Super conductors and their applications? L1 10M

B.Tech I Year I Semester Regular & Supplementary Examinations March 2023
ENGINEERING CHEMISTRY
(ME)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

- 1 a) Describe the Ion exchange process for demineralization of water L1 4 M
b) What are the advantages and disadvantages of Ion exchange process? L2 8 M

OR

- 2 Explain various steps involved in municipal solid waste water Treatment. L2 12 M

UNIT-II

- 3 a) What are the differences between primary and secondary batteries? L1 6 M
b) Explain the Construction and working of Lead acid battery. L2 6 M

OR

- 4 Define corrosion. Give an account of oxidation corrosion with relevant chemical equation involved. L3 12 M

UNIT-III

- 5 Describe the preparation, properties and uses of Bakelite L3 12 M

OR

- 6 a) What are significance of the Fuels for IC Engines L2 6 M
b) Write a note on Octane value and Cetane value. L2 6 M

UNIT-IV

- 7 Write short notes on:

- a) Define composites. L1 6 M
b) Classify the composites materials. L1 6 M

OR

- 8 a) What is cement? How do you classify the cement? L1 6 M
b) Explain in detail about setting and hardening of Portland cement L2 6 M

UNIT-V

- 9 Write an account Synthesis and Stabilization of Colloids L1 12 M

OR

- 10 What is Nanotechnology and explain its applications? L2 12 M

BASIC ELECTRONICS ENGINEERING

(CSE, CSM, CAD & CIA)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

- 1 a) Discuss the conduction properties of semiconductors and explain the process of electron-hole pair generation and recombination L2 8M
b) Intrinsic materials are not widely used, Explain the reasons? L2 4M

OR

- 2 a) List the advantages of n-type over p-type semiconductors L1 4M
b) Compare p-type and n-type semiconductors. L2 8M

UNIT-II

- 3 a) Define PN Junction and Explain how Depletion layer is formed in open circuited PN junction diode. L2 6M
b) Define and discuss the barrier potential of a PN junction diode with a neat sketch L2 6M

OR

- 4 a) List the applications of PN junction diode and Zener diode. L1 6M
b) Define Breakdown voltage and draw the symbol of Zener Diode L1 6M

UNIT-III

- 5 a) List the advantages of full wave rectifier over the half wave rectifier L1 6M
b) Determine the ripple factor for both half wave and full wave rectifier L3 6M

OR

- 6 a) Determine the value of capacitance to be used in a capacitor filter connected to a full wave rectifier operating at a standard aircraft power frequency of 400 Hz, if the ripple factor is 10% for a load of 500Ω. L3 4M
b) Explain the working principle of rectifiers with and without capacitors L2 8M

UNIT-IV

- 7 a) Explain the concept of DC and AC Load lines and discuss the criteria for Fixing the Q-point. L2 6M
b) Define Stability Factor S. Derive the expressions for the stability factors S, S' and S'' of a BJT bias. L1 6M

OR

- 8 a) List the different types of Biasing. L1 4M
b) Define Transistor Biasing and explain the need for Biasing L2 8M

UNIT-V

- 9 a) List the differences between N-channel JFET and P-channel JFET L1 6M
b) Sketch the transfer characteristics of P-channel JFET L2 6M

OR

- 10 a) List the differences between depletion and enhancement MOSFET. L1 4M
b) With the help of neat diagram, Explain the operation and characteristics of N-channel Depletion type MOSFET under Depletion mode. L2 8M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech I Year I Semester Regular & Supplementary Examinations March 2023

ENGINEERING MATERIALS

(CE)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

1 What are the substances which harm the qualities of good bricks in their manufacturing? Explain any five substances. L1 12M

OR

- 2 a) Write the various uses of stones. L2 6M
b) List the characteristics of good building stones. L2 6M

UNIT-II

3 What is meant by workability of concrete? How is it tested in field and in laboratory? L4 12M

OR

- 4 a) List the characteristics of good mortar. L2 6M
b) State the functions of ingredients in mortar. L2 6M

UNIT-III

- 5 a) What are the various ingredients of paints? State the functions of each of them. L1 6M
b) Explain the procedure to prepare the oil paint. L2 6M

OR

- 6 a) Explain the classification of trees. L2 6M
b) Distinguish between softwood and hard wood. L4 6M

UNIT-IV

7 What are smart materials? Explain their applications in civil engineering field? L3 12M

OR

- 8 a) Explain briefly about Aluminum. L2 6M
b) Explain briefly about Copper L2 6M

UNIT-V

9 Describe the penetration test on bitumen? L2 12M

OR

- 10 a) Discuss the characteristics of good aggregates. L1 6M
b) Write short notes on M sand. L1 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech I Year I Semester Regular & Supplementary Examinations March 2023
ENGINEERING GRAPHICS
(ECE, MECH & EEE)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit ($5 \times 12 = 60$ Marks)**UNIT-I**

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

OR

- 2 a) Construct a parabola in a parallelogram of sides 100 x 60 with an included angle of 75° L6 6M
b) Develop the involute of a regular hexagon of side 20 mm. Draw a tangent and normal to the curve at a distance of 100 mm from the centre of the hexagon L3 6M

UNIT-II

- 3 A point A is 20mm above the HP and 50mm in front of the VP. Another point B is 40mm below the HP and 15mm behind the VP. The distance between the projectors of the points, measured parallel to xy, is 75mm. Draw the projections of the points. Draw lines joining their FVs and TV L1 12M

OR

- 4 Draw the projections of a straight line AB of 70 mm long, in the following positions: L2 12M
a) Inclined at 30° to VP, in HP and one end on VP
b) Inclined at 45° to HP, one end 20 mm above HP and parallel to and 30 mm in front of VP
c) Inclined at 60° to VP, one end 20 mm in front of VP and parallel to and 25 mm above HP

UNIT-III

- 5 A cylinder of base diameter 50mm and axis 70 mm has a generator in the VP and inclined at 45° to the HP. Draw its projections L5 12M

OR

- 6 An equilateral triangular plane ABC of side 40mm has its plane parallel to VP and 20mm away from it. Draw the projections of the plane when one of its sides is (i) perpendicular to HP (ii) parallel to HP and (iii) inclined to HP at an angle of 45° . L5 12M

UNIT-IV

- 7 A cone of 50 mm diameter and axis 70 mm long. Its base is on HP. It is cut by a sectional plane perpendicular to VP and inclined to HP at 45° from apex 32mm. Draw the Front view, Sectional Top view and the True shape of the section. L1 12M

OR

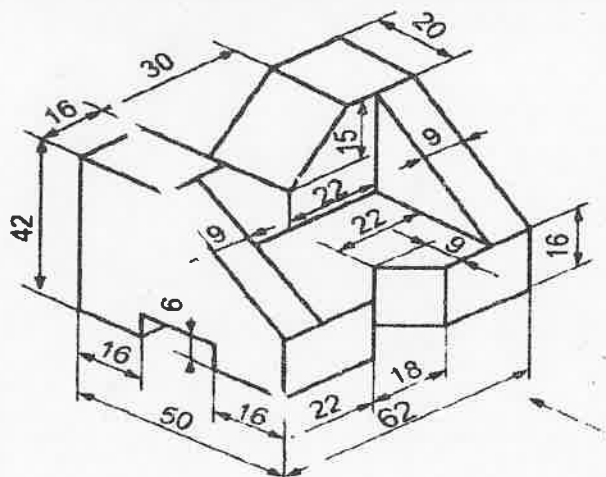
- 8 A cylinder of diameter of base 40 mm and axis 55 mm long, is resting on its base on HP. It is cut by a section plane, perpendicular to VP and inclined at 45° to HP. The section plane is passing through the top end of an extreme generator of the cylinder. Draw the development of the lateral surface of the cut cylinder. L2 12M

UNIT-V

- 9 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 12M

OR

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



SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech I Year I Semester Regular & Supplementary Examinations March 2023

C PROGRAMMING AND DATA STRUCTURE

(Common to CE, CSE, CSM, CAD & CIA)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

- 1 a) Define a variable. Write the variable declaration. What are the rules for declaring a variable? L2 6M
b) Describe the Structure of C Program with an example. L2 6M

OR

- 2 Write the syntax and illustrate the following statements with example L3 12M
i) if Statement ii) if else Statement iii) else if ladder
iv) Nested if statements v) Switch Case

UNIT-II

- 3 a) Define an Array. Write the syntax for declaring and initializing array with example. L1 6M
b) Write a C program to perform matrix addition. L6 6M

OR

- 4 a) Examine the types of storage class available in C. L5 6M
b) Describe about type qualifiers used in C. L2 6M

UNIT-III

- 5 a) Explain the concept of pointer to pointers with examples. L2 6M
b) Explain the concept of void pointers with examples. L2 6M

OR

- 6 a) Define structure and give the general syntax for structure. Write a suitable example program. L1 6M
b) Explain to declare and initialize a structure? Mention with an example. L2 6M

UNIT-IV

- 7 List the various operations that can be performed on stack? Explain with suitable example. L2 12M

OR

- 8 a) Explain briefly about various types of linked lists with suitable examples. L2 6M
b) List the applications of linked list. L1 6M

UNIT-V

- 9 What do you mean by Searching? Explain sequential search and binary search with suitable example. L1 12M

OR

- 10 Explain the algorithm for quick sort and give a suitable example. L2 12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech I Year I Semester Regular & Supplementary Examinations March 2023

THERMAL AND FLUID ENGINEERING

(EEE)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

1 Explain the various elements of hydroelectric power station with a neat sketch? L3 12M

OR

2 a) State the following terms state, path, process, cycle, intensive property and extensive property L3 6M

b) Describe in detail about Quasi Static Process with schematic diagram? L2 6M

UNIT-II

3 Draw and explain a P.V, P-T and T-S diagram for a pure substance L3 12M

OR

4 Describe the construction of Cochran boiler with neat sketch. L2 12M

UNIT-III

5 a) Write a short note on Vapour Pressure, surface tension and capillarity. L2 6M

b) The surface tension of water in contact with air at 20°C is 0.0725 N/m. the pressure inside a droplet of water is to be 0.02 N/cm² greater than the outside pressure. Calculate the diameter of droplet of water L4 6M

OR

6 What is manometer and classify it? Explain U tube manometer with neat diagram L4 6M

UNIT-IV

7 Derive Continuity equation in one dimensional form Euler's equation of motion and Bernoulli's energy equation? L3 12M

OR

8 Derive an expression for the loss of head due to sudden enlargement of a pipe. L3 12M

UNIT-V

9 A jet of water of diameter 50mm moving with a velocity of 25 m/s impinges on a fixed curved plate tangentially at one end at an angle of 30° to the horizontal. Calculate the resultant force of the jet on the plate if the jet is reflected through an angle of 50°. Take $g = 10 \text{ m/s}^2$ L3 12M

OR

10 a) Jet of 50 mm diameter delivers a stream of water at 20 m/s perpendicular to a plate that moves away from the jet 5 m/s. Find the force on the plate, work done and efficiency of jet. L5 6M

b) Differentiate between Kaplan turbine and Francis turbine L2 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech I Year I Semester Regular & Supplementary Examinations March 2023
PRINCIPLES OF ELECTRICAL CIRCUITS

(ECE)

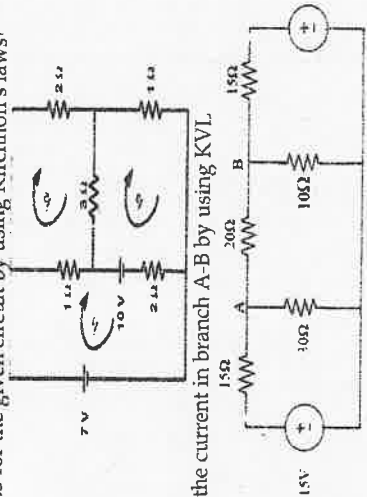
Time: 3 Hours

Max. Marks: 60

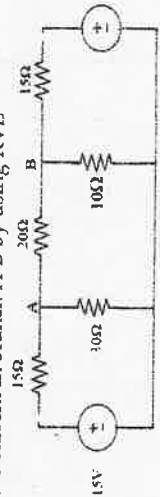
Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

1 a) Find i_1, i_2, i_3 for the given circuit by using Kirchoff's laws? L3 6M



b) Determine the current in branch A-B by using KVL L3 6M

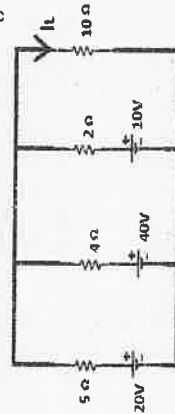


OR

- 2 a) State and explain Ohm's law with limitations. L2 6M
- b) State and prove Kirchoff's voltage law with suitable examples. L3 3M
- c) State and prove Kirchoff's current law with suitable examples. L3 3M

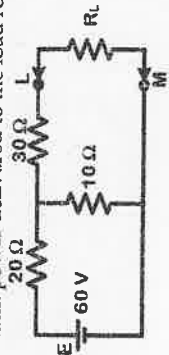
UNIT-II

- 3 a) State and explain Millman's theorem L3 6M
- b) Find the current I_L , use millman's theorem as shown in figure below. L3 6M



OR

- 4 a) State and prove maximum power transfer theorem. L3 6M
- b) Determine the maximum power delivered to the load resistance R_L L3 6M



UNIT-III

- 5 a) A series RL circuit with $R=30\Omega$ and $L=15H$ has a constant voltage $V=60V$ applied at $t=0$. Determine the current "i", voltage across resistor and voltage across inductor. L4 6M
- b) A Series RL circuit with $R=50\Omega$ and $L=10H$ has constant voltage $V=100V$ applied at $t=0$ by the closing the switch find the complete current. L4 6M

OR

- 6 a) The Circuit Consists Of Resistance= 20Ω Ohm, Inductance = $0.05H$, Capacitance = $20\mu F$ in Series With a $100V$ Constant at $t=0$. Find The Current Transient. L5 6M
- b) What is Laplace transform. Write the advantages. L2 6M

UNIT-IV

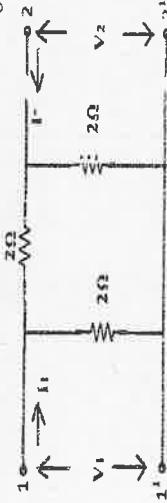
- 7 A coil of resistance 10Ω and inductance of $0.1H$ is connected in series with a $150\mu F$ capacitor across a $200V, 50Hz$. Calculate (i) inductive reactance (ii) capacitive reactance (iii) impedance (iv) current (v) power factor (vi) power in the circuit. L1 12M

OR

- 8 a) Derive an expression for average values of sine wave form L4 6M
- b) An alternating current is expressed as $I = 14.14 \sin 314t$. Determine. L2 6M
 - (i) Maximum current (ii) RMS current (iii) Frequency
 - (iv) Instantaneous current when $t = 0.02msec$.

UNIT-V

- 9 Explain about Constant-K low-pass filter in detail. L2 12M
- 10 a) Explain about ABCD-parameters L2 6M
- b) Find the transmission parameters for the circuit shown in figure. L2 6M



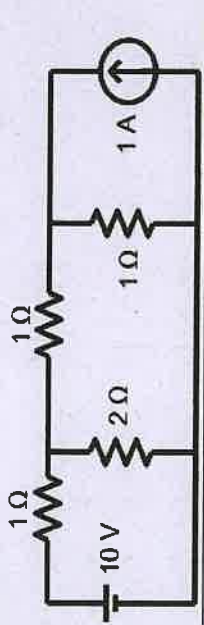
PART-A

(Answer all Three units, 3 x 10 =30 Marks)

UNIT-I

- 1 State and prove Kirchoff's laws and explain with suitable example. L2 10M
- 2 Explain in detail about RMS value, Average value, and Form Factor and Peak factor, peak value. L2 10M
- 3 a) State Super position theorem L2 2M
b) Calculate the current in 2Ω resistor in the given circuit using superposition theorem. L3 8M

UNIT-II



OR

- 4 a) Explain Long Shunt Compound Generator and short shunt generator with neat diagram L3 5M
b) List the applications of different types of dc generators L5 5M
- 5 a) Derive Torque equation of dc motor. L3 5M
b) The counter EMF of Shunt motor is 227 V. The field resistance is 160Ω and field current is 1.5A. If the line current is 36.5A, find the armature resistance also find armature current when the motor is stationary. L5 5M

OR

- 6 a) Explain the constructional details of transformer. L2 5M
b) A 20 kVA, 2000/200V, 50Hz transformer has 66 secondary turns. Calculate the number of primary turns and primary and secondary currents. Neglect losses. L4 5M

PART- B

(Answer all Three units, 3 x 10 =30 Marks)

UNIT-I

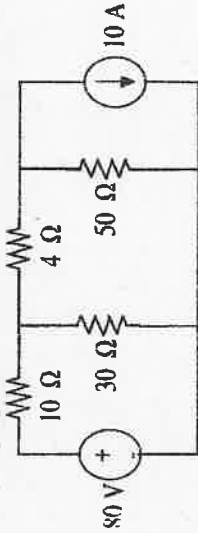
- 1 a) Define Doping and explain about P-and N-type semiconductors. L2 5M
b) Explain in detail about diffusion current. L3 5M
- 2 a) Explain the working principle of Bridge Rectifier with neat circuit diagram. Also draw its input and output waveforms. L4 5M
b) Explain the working principle of Full wave rectifier with a capacitor filter. L2 5M
- 3 a) What is a Bipolar junction Transistor? Mention its types. L1 5M
b) Discuss the operation of NPN transistor with neat schematic diagram. L2 5M
- 4 a) List the applications of a transistor and explain how transistor acts as a Switch. L1 5M
b) Explain in detail how the transistor works as an amplifier. L2 5M

UNIT-III

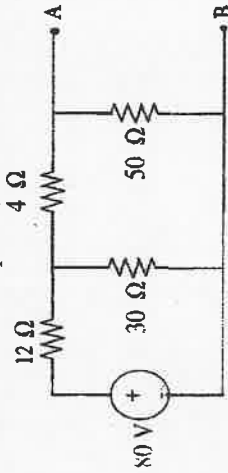
- 5 a) Compare between BJT and JFET. L3 5M
b) Explain working principle of EMOSFET with neat diagram. L3 5M
- 6 a) With a neat diagram, explain the Transfer characteristics of N-channel JFET. L4 5M
b) Sketch the transfer characteristics of P-channel JFET. L2 5M

UNIT-I

1 a) Verify Superposition Theorem for 4Ω resistor for the following circuit. L4 6M



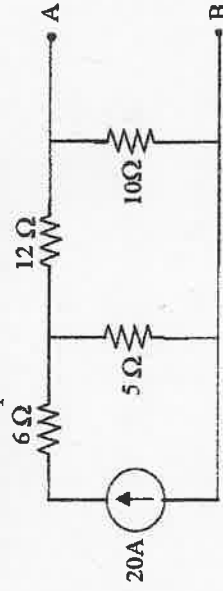
b) Find the Thevenin's equivalent for the circuit shown below. L4 6M



OR

2 a) State and explain Norton's Theorem? L1 6M

b) Find the Norton's equivalent for the circuit shown below. L4 6M



UNIT-II

3 a) A resistor of 50Ω and inductance of 100mH are connected in series across 200V , 50Hz supply. Determine the following L2 6M

(i) Impedance

(ii) current flowing through the circuit

(iii) power factor

b) Derive an expression for the current and impedance for a series RL circuit excited by a Sinusoidal alternating voltage. Draw the phasor diagrams. L3 6M

OR

4 A series RLC circuit of $R=40\Omega$, $L=50.07\text{mH}$ and a capacitor is connected across a 400V , 50Hz , A.C supply. This RLC combination draws a current of 10A . Calculate L2 12M

(i) Power factor of the circuit.

(ii) Capacitor value.

UNIT-III

5 Explain the working operation of a DC Motor in detail. L2 12M

OR

6 a) A D.C shunt generator has shunt field winding resistance of 100Ω . It is supplying a load of 5KW at a voltage of 250V . If its armature resistance is 0.22Ω . Calculate the induced emf of the generator. L4 6M

b) Define Torque and derive the expression for torque in a DC Motor. L2 6M

UNIT-IV

7 Draw and Explain the constructional diagram of a single phase transformer. L2 12M

OR

8 Explain construction and Working Principle of 3- ϕ Alternator. L1 12M

UNIT-V

9 Define torque. Explain various types of torques in measuring instruments. L1 12M

OR

10 Explain construction and operation of attraction type Moving Iron Instrument. L2 12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Regular & Supplementary Examinations March 2023
COMMUNICATIVE ENGLISH

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

1 a) Write a paragraph on "My Role Model".

b) Make six "wh" questions with examples.

OR

2 a) Write a letter to the Municipal Commissioner complaining about the open man holes in your area and requesting him to take immediate action.

b) *Half a Rupee Worth* describes human greed and corruption. Discuss.**UNIT-II**

3 a) Fill in the blanks with suitable articles.

i) Ramanathan is _____ one eyed man.

ii) Tom is _____ University graduate.

iii) _____ Ramayana is an epic.

iv) Ravi Sankar plays _____ flute.

v) _____ apple a day keeps the doctor away.

vi) _____ Sun rises in the east.

b) Fill in the blanks with suitable cohesive Devices.

(whereas, besides, while, and, before, though)

i) Ram _____ Sita lived in forest.

ii) The thief had escaped _____ the police arrived.

iii) Sanjay met his classmate _____ he was leaving abroad.

iv) Karthik owns a car _____ a bike.

v) _____ he is physically challenged, he helps his friends.

vi) I left for Delhi _____ my father left for Mathura.

OR

4 a) Convert the following sentences into appropriate voice.

i) Ilayaraja plays music.

ii) Sudheer is teaching Electronics.

iii) Jyoshna has eaten a chocolate.

iv) The bell was rung by the peon.

v) Rama killed Ravana.

vi) Chandra can complete this job.

b) Describe *The Thief's Well* by Munshi Premchand depicting the Indian society of his time.**UNIT-III**

5 a) Write the difference between summarizing and Report Writing.

b) What are the different strategies adopted for effective reading?

OR

6 a) "*I am not that Woman*" is a poem with a theme of revolutionary ideas. Write the themes that justify the title.

b) What are the differences between Attentive Listening and Focused Listening?

UNIT-IV

7 a) Write a paragraph on your friend's daily routines

b) Correct the following with appropriate adjective forms.

i) Nikhil is the cleverer boy in the class.

ii) Aarathi's barbie is prettier than Sania's doll.

iii) Copper is useful than any other metal.

iv) This winter is coldest than the previous winter.

v) Which is the bigger city in the world?

vi) Vikas is best than Leela.

OR

8 a) Give suitable synonyms to the following words.

i) Suspicion

ii) Wealthy

iii) Sumptuous

iv) Sacred

v) Simple

vi) Dexterous

b) Priorities define who you are. How do you prioritize tasks in life?

UNIT-V

9 a) Prayer is the key to tap universal intelligence. How did it reflect in Kalam's family?

b) Abdul Kalam's life is to be imbibed and emulated. What are the qualities that you adore in him?

OR

10 a) Correct the following sentences with suitable preposition.

i) Saraswathi lives at Australia

ii) The girls have been waiting since two hours.

iii) Osho is suffering with fever.

iv) Indians celebrate Republic Day in 26th January.

v) Anantha Krishna owns a car beside a moped.

vi) He swam into the river.

b) Write an essay on the effect of Social media on youth.

L2 6M
L1 6M

L2 6M

L1 6M

L2 6M

L1 6M

L1 6M

L2 6M

L2 6M

L1 6M

L2 6M

L1 6M

L1 6M

L1 6M

L2 6M

L1 6M

L2 6M

L1 6M

L2 6M

L1 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Regular & Supplementary Examinations March 2023
MATHEMATICAL AND STATISTICAL METHODS
(Common to CSM, CAD & CIA)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

- 1 a) Using the principle of mathematical induction, show that $3^{4n+2} + 5^{2n+1}$ is a multiple of 14, for all non-negative integers. L3 6 M
b) Find the general solution of $63x - 23y = -7$ by using Euclidean algorithm. L1 6 M
- OR
- 2 a) Multiply $(11101)_2$ & $(110001)_2$ and also convert $(1111101011100)_2$ as a hexadecimal. L1 6 M
b) Factorize 809009 by applying Fermat's method of factorization. L3 6 M
- 3 a) Solve the system of linear equations $3x + 4y \equiv 5 \pmod{13}$; $2x + 5y \equiv 7 \pmod{13}$ L3 6 M
b) Define Fermat's little theorem and find the remainder of 17! When it is divided by 23. L1 6 M

OR

- 4 a) Write the statement of Wilson's theorem and prove that $63! \equiv -1 \pmod{71}$ L3 6 M
b) Define Euler phi function and compute the least residue of $2^{340} \pmod{341}$. L1 6 M
- UNIT-II**
- 5 a) Prove that $S^2 = \frac{1}{n} \sum_{i=1}^n \{(x_i - \bar{x})^2\}$ is not unbiased estimator, but $\frac{1}{n-1} \sum_{i=1}^n \{(x_i - \bar{x})^2\}$ is unbiased estimator of the parameter σ^2 for a random sample x_1, x_2, \dots, x_n . L3 6 M
b) What is the size of the smallest sample required to estimate an unknown proportion to within a maximum error of 0.06 with at least 95% confidence? L2 6 M

OR

- 6 a) Show that $\frac{ns^2}{n-1}$ is a consistent estimator of σ^2 . L3 6 M
b) Obtain the maximum likelihood estimation of θ in $f(x, \theta) = (1 + \theta)x^\theta$, $0 < x < 1$ based on an independent sample of size n . Examine whether this estimate is sufficient for θ . L2 6 M

UNIT-IV

- 7 a) Let $P = \begin{pmatrix} 0.1 & 0.5 & 0.4 \\ 0.6 & 0.2 & 0.2 \\ 0.3 & 0.4 & 0.3 \end{pmatrix}$ be the transition probability matrix with the initial distribution $P^{(0)} = (0.1, 0.2, 0.1)$, then find $P(X_2 = 3, X_1 = 3, X_0 = 2)$, $P(X_2 = 3)$ L1 6 M
b) Explain the different states of Markov chain with examples. L4 6 M

OR

- 8 a) Three boys A, B, C are throwing a ball to each other. A always throws the ball to B and B always throws to C but C is just as likely to throw the ball to B as to A. Show that the process is Markovian. Find the transition matrix and classify the states. L4 6 M
b) Define n step transition probability and Markov process. L1 6 M

UNIT-V

- 9 One person barber shop has six chairs to accommodate people waiting for haircut. Assume that customers who arrive when all the six chairs are full leave without entering the shop. Customers arrive at the average of 3 per hour and spend an average of 15 minutes for service. Find (i). The probability that a customer can get directly into the barber chair upon arrival. (ii). Expected number of customers waiting for a haircut. (iii). Effective arrival rate. (iv). The time a customer can expect to spend in the shop. L5 12 M
- OR
- 10 At a railway station only one train is handled at a time. The railway yard is sufficient only for two trains to wait while other is given signal to leave the station. Trains arrive at the station at an average rate of 6 per hour and the railway station can handle them on an average of 12 per hour. Assuming Poisson arrivals and exponential service distribution, find the steady state probabilities for the various number of trains in the system. Find also the average waiting time of a new train coming into the yard. L5 12 M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year I Semester Regular & Supplementary Examinations March 2023

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

(CSE & CIVIL)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

- 1 What is Managerial Economics? Briefly explain the Role and Responsibilities of managerial economist in business decision making. L2 12M
- 2 a) What is demand analysis? Discuss in detail. L1 6M
b) The demand for a particular product depends on several factors - Discuss. L2 6M

OR

UNIT-II

- 3 From the following information relating to Hi-Tech publishers, you are required to find out (A) Break-even point in units (B) Margin of Safety. L5 12M

	Year 1 (in Rs.)	Year 2 (in Rs.)
Sales	50000	120000
Fixed cost	10000	20000
Variable cost	30000	60000

OR

- 4 a) "Economies occur as a result of increase in scale of production" comment. L4 6M
b) State the dis-economies of scale. L1 6M

UNIT-III

- 5 a) Define market structure. L1 6M
b) How markets are classified based on degree of competition? L4 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: L5 12M

Year	Project1 (Rs.)	Project2 (Rs.)
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 a) Explain the types of Capital Budgeting methods. L2 6M
b) Write short notes on Long term capital. L1 6M

UNIT-V

- 9 Write short notes on Inventory Turnover Ratio and Inventory holding periods. And also calculate with following data. A Firm sold goods worth Rs 5,00,000 and its gross profit is 20 percent of sales value. The inventory at the beginning of the year was Rs 16000 and at end of the year was 14000. L3 12M

OR

- 10 a) Write short notes on Working capital. L1 6M
b) Write short notes on Journal and Ledger with format. L1 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year I Semester Regular & Supplementary Examinations March 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 a) A class consists of 6 girls and 10 boys. If a committee of 3 is chosen at random from the class, find the Probability that (i) 3 boys are selected (ii) Exactly 2 girls are selected
 - b) Two cards are selected at random from 10 cards numbered 1 to 10. Find the probability that the sum is even if (i) The two cards are drawn together. (ii) The two cards drawn one after other with replacement.
- OR
- 2 a) State Baye's theorem.
 - b) In a certain college 25% of boys and 10% of girls are studying maths. The girls constitute 60% of the student body.
(a) What is the probability that maths is being studied?
(b) If a student is selected at random and is found to be studying maths, find the probability that the student is a girl?
(c) a boy?

UNIT-II

- 3 Find the root of the equation $x \log_{10}(x) = 1.2$ using False position method.
- 4 a) Apply Newton's forward interpolation formula and the given table of values obtain the value of $f(x)$ when $x=1.4$.

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 $f(25)=0.2707, f(30)=0.3027, f(35)=0.3386, f(40)=0.3794$

UNIT-III

- 5 Using R-K method of 4th order, find $y(0.1)$ and $y(0.2)$ given that $\frac{dy}{dx} = x + y, y(0) = 1$.

OR

Evaluate $\int_0^1 \frac{1}{1+x} dx$ by

(i) By Trapezoidal rule and Simpson's $\frac{1}{3}$ rule.

(ii) Using Simpson's $\frac{3}{8}$ rule and compare the result with actual value.

UNIT-IV

- 7 a) Find the Laplace transform of $f(t) = e^{3t} - 2e^{-2t} + \sin 2t + \cos 3t + \sinh 3t - 2\cosh 4t + 9$.
 - b) Find the Laplace transform of $\frac{1 - \cos at}{t}$.
- OR
- 8 a) Find $L^{-1} \left\{ \log \left(\frac{s-a}{s-b} \right) \right\}$
 - b) Find the Inverse Laplace transform of $\frac{1}{s(s^2+a^2)}$
- OR
- 9 Using Laplace transform method to solve $y'' + 7y' + 10y = 4e^{-3t}$ where $y(0) = 0, y'(0) = -1$
- OR
- 10 a) State Damping Rule
 - b) Using Z-transform solve $y_{n+2} - 3y_{n+1} + 2y_n = 0, y_0 = 0, y_1 = 1$

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year I Semester Regular & Supplementary Examinations March 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 a) Define Algebraic equation and Transcendental equation L1 4M
 b) Find a positive root of the equation $x^3 - x - 1 = 0$ by Bisection method L3 8M
- OR
- 2 a) Using Newton-Raphson method, find reciprocal of 12. L3 6M
 b) Find a real root of the equation $x \tan x + 1 = 0$ using Newton - Raphson method. L3 6M

UNIT-II

- 3 a) State Taylor's series formula for first order differential equation L1 2M
 b) Tabulate $y(0.1)$ and $y(0.2)$ using Taylor's series method given that L1 10M
 $\frac{dy}{dx} = Y^2 + X$ and $y(0) = 1$
- OR
- 4 a) Evaluate $\int_0^4 e^x dx$ by Simpson's $\frac{3}{8}$ rule with 12 sub divisions L2 6M
 b) Evaluate $\int_0^{\frac{\pi}{2}} \sin x dx$ using Trapezoidal rule and compare with exact value. L5 6M

UNIT-III

- 5 a) Using Laplace transform, evaluate $\int_0^{\infty} \frac{\cos at - \cos bt}{t} dt$ L3 6M
 b) Find the Laplace transform of $\int_0^t e^{-t} \cos t dt$ L3 6M
- OR
- 6 a) Find the Inverse Laplace transform of $\frac{1}{s(s^2 + a^2)}$ L3 6M
 b) Using Convolution theorem, Find $L^{-1} \left\{ \frac{1}{(s+a)(s+b)} \right\}$ L3 6M

UNIT-IV

- 7 Using Laplace transform method to solve L6 12M
 $Y'' - 3Y' + 2Y = 4t + e^{3t}$ where $Y(0)=1, Y'(0)=1$.
- OR
- 8 a) Find the half range cosine series expansion of $f(x) = x(2-x)$ in $0 \leq x \leq 2$ L1 6M
 b) Using Laplace transform method to solve $Y' - Y = t, Y(0) = 1$. L3 6M

UNIT-V

- 9 Find the Fourier sine and cosine transforms of $f(x) = \frac{e^{-ax}}{x}$ and deduce that L1 12M

$$\int_0^{\infty} \frac{e^{-ax} - e^{-bx}}{x} \sin Px dx = \tan^{-1} \left(\frac{P}{a} \right) - \tan^{-1} \left(\frac{P}{b} \right)$$

OR

- 10 a) Find the Fourier cosine transform of $e^{-ax} \cos ax, a > 0$ L1 6M
 b) If $F(p)$ is the complex Fourier transform of $f(x)$, then prove that the complex Fourier transform of $f(x) \cdot \cos ax$ is $\frac{1}{2} [F(p+a) + F(p-a)]$ L5 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

II B.Tech I SEM (R20) Regular & Supplementary Examinations of MARCH-2023
NUMERICAL METHODS, PROBABILITY & STATISTICS
(MECH)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

- 1 a) Define Algebraic equation and Transcendental equation. L1 2M
b) Find a positive root of the equation $x^3 - x - 1 = 0$, correct to 4 decimals L3 10M
using the bisection method.
- 2 a) Write the formula for Newton's forward interpolation. L1 2M
b) From the following table values of x and $y = \tan x$. Interpolate the values L5 10M
of y when $x = 0.12$ and $x = 0.28$.

OR

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

UNIT-II

- 3 Solve $\frac{dy}{dx} = x + y$, given $y(0) = 0$, find $y(1.1)$ and $y(1.2)$ by Taylor's series L3 12M
method.

OR

- 4 a) Evaluate $\int_0^1 e^x dx$ by Simpson's $\frac{3}{8}$ th rule with 12 sub divisions. L5 6M
b) Evaluate $\int_0^1 \frac{dx}{1+x}$ by Trapezoidal rule. L5 6M

UNIT-III

- 5 a) i). The weights of 6 competitors in a game are given below 58, 62, 56, 63, L3 3M
55, 61 kgs. Find arithmetic mean of weight of competitors. L1 3M
ii). Find the median of the following values 26, 8, 6, 12, 15, 32.
b) Find arithmetic mean to the following data. L1 6M

Marks	10-20	20-30	30-40	40-50	50-60
frequency	5	8	25	22	10

OR

- 6 a) State Baye's theorem. L1 2M
b) Determine (i) $P(B/A)$; (ii) $P(A/B)$; if A and B are events with L5 10M
 $P(A) = \frac{1}{3}$; $P(B) = \frac{1}{4}$ and $P(A \cap B) = \frac{1}{2}$.

UNIT-IV

- 7 A random variable X has the following probability function. L5 12M

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

Determine (i) k (ii) Mean (iii) variance (iv) if $P(X \leq c) > 1/2$, find the Minimum value of c.

OR

- 8 The probability density function of a random variable X is L6 12M
$$f(x) = \begin{cases} \frac{1}{2} \sin x, & \text{for } 0 \leq x \leq \pi \\ 0, & \text{elsewhere} \end{cases}$$

Find the mean, mode and median of the distribution and also find the probability between 0 and $\pi/2$.

UNIT-V

- 9 a) If 2% of light bulbs are defective. Find the probability that L3 6M
(i) At least one is defective (ii) $P(1 < x < 8)$ in a sample of 100.
b) If for a Poisson variate $2P(X=0) = P(X=2)$ Find the probability that i) L3 6M
 $P(X \leq 3)$ ii) $P(2 < X \leq 5)$ iii) $P(X \geq 3)$.

OR

- 10 Ten competitors in a musical test were ranked by the three judges A, B and L3 12M
C in the following order:

Ranks by A	1	6	5	10	3	2	4	9	7	8
Ranks by B	3	5	8	4	7	10	2	1	6	9
Ranks by C	6	4	9	8	1	2	3	10	5	7

Using rank Correlation coefficient method, discuss which pair of judges has the nearest approach to common likings in music.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year I Semester Regular & Supplementary Examinations March 2023
COMPUTER ORGANIZATION & ARCHITECTURE
(CSE)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

- 1 a) Differentiate between Primary Memory and Secondary Memory. L2 6M
b) Identify and explain various Phases of instruction cycle L3 6M

OR

- 2 a) What is Addressing Mode and List Different Addressing Modes L3 6M
b) If Accumulator A = 0000 1011, B = 0000 1100 and Carry bit C = 1 then find the value after the execution of the following Instructions L2 6M
i) NEG A ii) ADD A,B iii) SHR A
iv) SHLA A v) AND A,B vi) RORC A.

UNIT-II

- 3 Develop flowchart for the Multiplication of floating-point number and illustrate with an example. L6 12M

OR

- 4 a) What is the General Form of Floating-point representation and give the significance of each part L5 6M
b) Discuss the ASCII Code for the representation of Characters L2 6M

UNIT-III

- 5 a) What is Hardwired Control? Explain in detail with a neat diagram. L2 6M
b) Differentiate between Hardwired Control and Micro-programmed control L2 6M

OR

- 6 a) Define Routine and mapping in address sequencing. L2 6M
b) Describe the Address Sequencing for control memory with neat block diagram. L3 6M

UNIT-IV

- 7 Explain how memories connected with CPU with diagram. L3 12M

OR

- 8 a) What is cache memory What is hit and miss in the cache memory? L2 6M
b) List and Explain different mapping in Cache memory L3 6M

UNIT-V

- 9 a) Anticipate three types of hazards (conflicts) in instruction pipelining L3 6M
b) Construct 4-segment Instruction Pipeline and explain L2 6M

OR

- 10 a) Explain the three major difficulties caused by the branch instruction in the instruction pipeline. L3 6M
b) Explain the following with neat sketch L3 6M
i) UMA Multiprocessor ii) NUMA multiprocessor

Time: 3 Hours

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

UNIT-I

- 1 a) What is the difference between a plain scale and diagonal scale? L2 2 M
- b) What do you mean by significant figures and rounding off numbers? How these affect the computations? L2 4 M
- c) The measured sides of a rectangular tract are 30.270 m and 56.070 m. The measurement was made using a 30 m metallic tape, too short by 0.025 m. What would be the error in the area of the tract? 6 M

OR

- 2 a) Write a short note on survey of an area using chain and compass. L3 6 M
- b) The observed bearings of a traverse survey are shown below: L4 6 M

Line	AB	BC	CD	DA
FB	124°30'	68°15'	310°30'	200°15'
BB	304°30'	246°00'	135°15'	17°45'

At what stations local attraction is suspected? Determine the correct bearings of lines and also calculate the included angles.

UNIT-II

- 3 a) What do you mean by balancing of sights? How it helps in reducing the errors in levelling? L2 4 M
- b) Find the RLs of the stations 1 to 6 on the ground level from the following data. If a uniform upward gradient of 1 in 20 for the formation level starts at station 1, having elevation of 150 m, find the height of embankment and depth of cutting at stations 1,2,3,4,5 and 6. L4 8 M

Chain age	Station	B.S.	I.S.	F.S.	R.L.	Remarks
0	B.M.	10.11				153.46 m
100	1		3.25			
200	2		1.10			
300	3	6.89		0.35		
400	4		3.14			
500	5	11.87		3.65		
	6			5.98		

OR

- 4 a) Differentiate between direct and indirect methods of contouring. L4 4 M
 - b) What do you mean by contour gradient? Explain its importance in route alignment for a road in hilly area. L2 8 M
- UNIT-III**
- 5 a) Explain the station adjustments made while using a theodolite. L2 6 M
 - b) Explain the method of vertical angle measurement in using a theodolite. L2 6 M

OR

To determine the gradient between two points C and D, the following data were collected: L4 12 M

Instrument station	H.I. (m)	R.L. (m)	Instru. Coordinates		Staff station	Bearing	Staff readings	Vertical angle
			L	D				
A	1.50	1020.60	800	1800	C	15°14'	1.10, 1.85, 2.60	8°09'
B	1.53	1021.21	950	2500	D	340°18'	1.32, 1.91, 2.50	2°03'

The tachometer was fitted with an anallactic lens and the instrument constant was 100. Find the gradient from C to D and bearing of CD.

UNIT-IV

- 7 a) What purpose do curves serve? What are the elements of a simple circular curve? How a simple circular curve is designated? L2 4 M
 - b) Two roads having a deviation of 52°30' are to be joined by simple 8° curve. Chainage at the intersection point is 7820 m, calculate the necessary data for setting the curve by Rankine's method of deflection angles. L3 8 M
- OR
- 8 a) A compound curve, consisting of two simple circular curves of radii 350 m and 500 m, is to be laid out between two straights. The angles of intersection between the tangents and the two straights are 25° and 55°. Calculate the various elements of the compound curve L4 6 M
 - b) A reverse curve is to join two straights having a very acute angle of intersection. The common tangent of length 140 m, makes an angle of intersection of 120° and 130° with the main straights. Calculate the suitable common radius. L4 6 M

UNIT-V

- 9 A line AB was measured using EDM. The instrument was set up at P in line with AB on the side of A remote from B. The wavelength of frequency 1 (f₁) is 10 m exactly. Frequency 2 (f₂) is (9/10)f₁ and that of frequency 3 (f₃) is (99/100)f₁. Calculate the accurate length of AB that is known to be less than 200 m, from the phase difference readings given below. L4 12 M

Line	Phase difference (m)		
	f ₁	f ₂	f ₃
PA	4.337	7.670	0.600
PB	7.386	1.830	9.911

OR

- 10 a) Describe the role of GPS and its applications in surveying. L1 6 M
- b) Describe the various parts and functions of Electronic Theodolite. L1 6 M

ANALOG ELECTRONIC CIRCUITS

(EEE)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

- 1 Summarize the expressions of Gain, input and output resistances for a current shunt feedback amplifier with necessary derivations. L2 12M

OR

- 2 a) Show that how a negative feedback reduces gain of an amplifier. L1 6M
b) An amplifier has open loop gain 1000 and feedback ratio of 0.04, if the open loop gain changes by 10% due to temperature, find the percentage change in the gain of the amplifier feedback. L3 6M

UNIT-II

- 3 a) Draw the circuit diagram of Hartley oscillator using BJT and derive the expression for frequency of oscillations. L1 8M
b) In the Hartley oscillator $L_2=0.4\text{mH}$ and $C=0.004\mu\text{F}$. If the frequency of the oscillator is 120kHz, find the value of L_1 . Neglect mutual inductance. L3 4M

OR

- 4 a) Interpret the various types of oscillators. L3 6M
b) Explain with circuit diagram of Wein-bridge oscillator using BJT L2 6M

UNIT-III

- 5 a) What is frequency compensation and explain how the frequency response is varied with respect to External Compensation technique. L1 8M
b) Explain how the frequency response is varied with respect to internal Compensation technique. L2 4M

OR

- 6 a) Explain the basic information and pin configuration of an op-amp. L2 6M
b) Draw the equivalent circuit diagram of Op-amp and list out the ideal characteristics of an operational amplifier. L1 6M

UNIT-IV

- 7 a) Design a differentiator to differentiate an input signal that has $f_{\text{max}}=100\text{Hz}$. L2 6M
b) Explain the operation of integrator using op-amp with a neat circuit diagram. L3 6M

OR

- 8 a) Design and explain the operation of inverting summing amplifier. L3 6M
b) Explain sample and hold circuit using op-amp. L2 6M

UNIT-V

- 9 Design a low pass filter at a cut-of frequency of 15.9kHz with pass band gain of 1.5 and draw the frequency response. L3 12M

OR

- 10 a) Explain the weighted resistor DAC with a neat diagram. L2 6M
b) An 8-bit Analog to Digital converter has a supply voltage of +12 volts. Calculate: (i) The voltage step size for LSB. L4 6M
(ii) The value of analog input voltage for a digital output of 01001011.

UNIT-I

- 1 a) Describe the construction of PN Junction Diode. L1 4M
- b) Illustrate the working of a PN junction diode under forward bias and reverse bias with neat schematic diagrams L1 8M
- OR
- 2 a) Analyze the current components of a PN Junction Diode and derive the diode current equation. L4 6M
- b) When a reverse bias is applied to a germanium PN Junction Diode, the reverse saturation current at room temperature is $0.3\mu\text{A}$. Determine the current flowing in the diode when 0.15V forward bias is applied at room temperature. L3 6M

UNIT-II

- 3 a) Define the following terms: i) Ripple factor ii) Efficiency iii) Peak inverse voltage L1 3M
- b) Derive the expressions for Average DC current, RMS Value of Current, DC Power Output and AC Power input for a Full Wave Rectifier. List the advantages. L3 9M

OR

- 4 a) With a neat circuit diagram and waveforms, illustrate the working of a Bridge rectifier. L2 6M
- b) A $5\text{k}\Omega$ load is fed from a bridge rectifier connected across a transformer secondary whose primary is connected to 460V , 50Hz supply. The ratio of number of primary turns to secondary turns is 2:1. Estimate DC load current, ripple voltage and PIV rating of diode. L2 6M

UNIT-III

- 5 a) Define a transistor. Draw the circuit symbols of PNP and NPN transistor and label all terminals. L1 3M
- b) Explain the Input and Output characteristics of a BJT in CE Configuration. L5 9M

OR

- 6 a) Define FET and explain different types of FET. L5 6M
- b) Explain the construction and working principle of N-Channel JFET. L2 6M

UNIT-IV

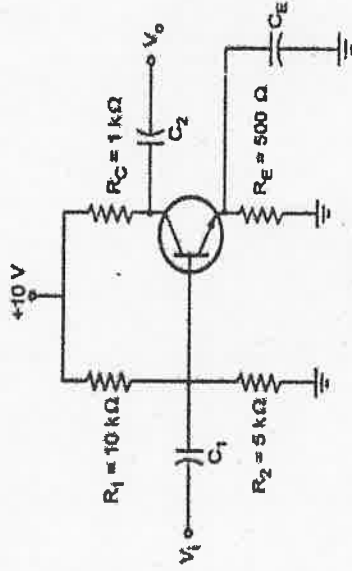
- 7 a) Define Stability Factor, S. Derive the stability factor, S for collector to base bias of BJT. L3 6M

- b) Design a collector to base bias circuit for the specified conditions: $V_{CC} = 15\text{V}$, $V_{CE} = 5\text{V}$, $I_C = 5\text{mA}$ and $\beta = 100$. L3 6M

OR

- 8 a) Illustrate Thermistor Compensation Technique for stabilization against variations in Q-point. L2 6M

- b) For the circuit shown in Figure, $\beta = 100$ for the silicon transistor. Calculate V_{CE} and I_C . L3 6M



UNIT-V

- 9 a) Using low frequency h-parameter model, evaluate the expressions for voltage gain, current gain, input impedance and output admittance for a BJT Amplifier in CE configuration. L3 6M
- b) A CE amplifier is driven by a voltage source of internal resistance $R_s = 800\Omega$ and the load impedance of $R_L = 1000\Omega$. The h-parameters are $h_{ie} = 1\text{k}\Omega$, $h_{oe} = 50$, $h_{fe} = 25\mu\text{A/V}$ and $h_{re} = 2 \times 10^{-4}$. Find current gain, voltage gain, input impedance and output impedance using exact analysis. L3 6M

OR

- 10 a) Analyze CE amplifier with emitter resistance using simplified h-parameter model. L3 6M
- b) For a CB transistor, amplifier driven by a voltage source of internal resistance $R_s = 1200\Omega$, the load Impedance of $R_L = 1000\Omega$. The h- parameters are $h_{ib} = 22\Omega$, $h_{rb} = 3 \times 10^{-4}$, $h_{fb} = -0.98$, $h_{ob} = 0.5\mu\text{A/V}$. Find current gain, voltage gain, input impedance and output impedance using approximate analysis. L3 6M

Time: 3 Hours

Max. Marks: 60

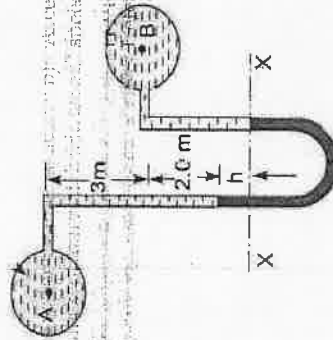
Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- 1 a) Define surface tension. Derive an expression for the surface tension on liquid droplet. L1 3M
- b) The surface tension of water in contact with air at 20°C is 0.072 N/m . The pressure inside of water droplet of water is to be 0.02 N/cm^2 greater than the outside pressure. Calculate the diameter of the droplet of water. L3 4M

OR

- 2 A differential manometer is connected at two points A and B of two pipes as shown in the figure. The pipe A contains a liquid of specific gravity 1.5 while pipe B contains a liquid of specific gravity 0.9 pressure at A and B are 1 kgf/cm^2 and 1.80 kgf/cm^2 respectively. Find the difference in Mercury level in a differential manometer. L3 12M

**UNIT-II**

- 3 Water flows through a pipe AB 1.2 m diameter at 3 m/s and then passes through a pipe BC 1.5 m diameter. At C, the pipe branches. Branch CD is 0.8 m in diameter and carries one third of the flow in AB. The flow velocity in branch CE is 2.5 m/s. Find the volume rate of flow in AB, the velocity in BC, the velocity in CD and the diameter of CE. L3 12M

OR

- 4 a) Explain Energy gradient line and Hydraulic gradient line. L2 4M
- b) Water is flowing through a pipe has diameter 300 mm and 200 mm at the bottom and upper end respectively. The intensity of pressure at the bottom end is 24.525 N/cm^2 and the pressure at the upper end is 9.81 N/cm^2 . Determine the difference in datum head if the rate of flow through pipe is 40 lit/s . L3 8M
- 5 a) Derive an expression for the rate of flow through an orifice meter. L2 8M
- 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. L5 4M

OR

- 6 a) What is pitot tube? Explain the method of finding flow velocity using pitot tube. L2 6M
- b) Recall the concept of pipes in series and parallel. L1 6M

UNIT-IV

- 7 A jet of water moving at 12 m/s impinges on vane shaped to deflect the jet through 120° when stationary. If the vane is moving at 5 m/s , find the angle of the jet so that there is no shock at inlet. What is the absolute velocity of the jet at exit in magnitude and direction and the work done per second per unit weight of water striking per second? Assume that the vane is smooth. L3 12M

OR

- 8 a) Classify different types of hydroelectric power stations. L1 6M
- b) Discuss the factors to be considered for selection of site for hydroelectric power plant. L2 6M

UNIT-V

- 9 Explain the Classification and efficiencies of turbines in detail. L2 12M

OR

- 10 a) Why is priming required in pumps? 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 of curved back to an angle of 30° with the periphery. The impeller diameter is 300 mm and outlet width is 50 mm . 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 Regular & Supplementary Examinations March 2023

DATABASE MANAGEMENT SYSTEMS

(CSE, CIA, CSM & CAD)

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. L2 6M
b) Differentiate database users and administrators L4 6M

OR

- 2 Explain about ER model and Components of ER Di L2 12M

UNIT-II

- 3 What is a Join? Discuss about various joins used in SQL. L2 12M

OR

- 4 a) Illustrate Set comparison operator L3 6M
b) Distinguish different types of aggregate operators with examples in SQL L5 6M

UNIT-III

- 5 a) Illustrate redundancy and the problems that it can cause. L3 6M
b) Explain about Functional Dependency. L2 6M

OR

- 6 a) What is the use of Fourth normal form? Explain by listing some of its major advantages. L2 6M
b) Differentiate 4NF and MVD with example L4 6M

UNIT-IV

- 7 a) Define a Transaction. List the properties of transaction L1 6M
b) How do you implement Atomicity and Durability L2 6M

OR

- 8 a) Compare serializability and non-serializability L5 6M
b) List out the types of failures. L1 6M

UNIT-V

- 9 a) Illustrates the basic principle of media recovery on a database. L3 6M
b) Discuss about Times tamp based locking protocols? L2 6M

OR

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

Time: 3 Hours

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

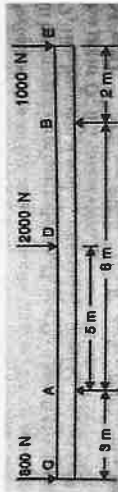
UNIT-I

- 1 A simply supported beam with over hanging ends carries transverse loads as shown in figure. If $W = 10w$, what is the overhanging length on each side, such that the bending moment at the middle of the beam, is zero? Sketch the shear force and bending moment diagrams.



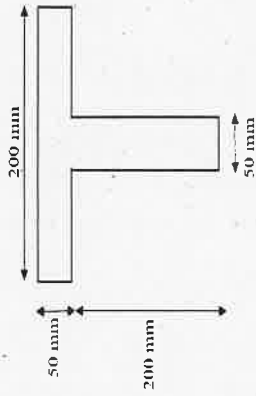
OR

- 2 Draw the S.F. and B.M. diagrams for the beam which is loaded as shown in figure. Determine the points of contra flexure within the span AB.



UNIT-II

- 3 A T - shaped cross section of a beam shown in figure is subjected to a vertical shear force of 100 kN. Calculate the shear stress at important points and draw shear stress distribution diagram. Moment of inertia about the horizontal neutral axis (I) = $113.4 \times 10^6 \text{ mm}^4$.



OR

- 4 A circular log of timber has diameter 'D'. Find the dimensions of the strongest rectangular section to resist moment, one can cut from this log.

UNIT-III

- 5 Two shafts of the same material and same lengths are subjected to the same torque, if the first shaft is of a solid circular section and second shaft is of hollow circular section, whose internal diameter is 2/3 of the outside diameter and the maximum shear stress developed in each shaft is the same, compare the weights of the shafts.

OR

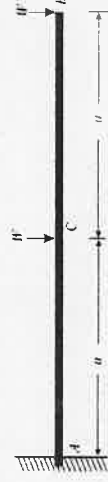
- 6 A carriage spring is to be 600 mm long and made of 9.5 mm thick steel plates and 50 mm broad. How many plates are required to carry a load of 4.5 kN, without the stress exceeding 230 MN/m². What would be central deflection and the initial radius of curvature, if plates straighten under the load? $E = 200 \text{ GN/m}^2$.

UNIT-IV

- 7 A timber beam of rectangular section has a span of 4.8 m and is simply supported at its ends. It is required to carry a total load of 45kN uniformly distributed over the whole span. Find the value of the breadth (b) and depth (d) of the beam, if maximum bending stress is not to exceed 7 Mpa and maximum deflection is limited to 9.5 mm. Take E for the timber as 10.5 GPa.

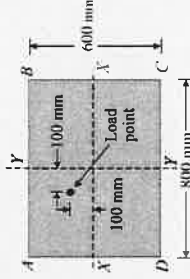
OR

- 8 A cantilever of length 2a is carrying a load of W at the free end, and another load of W at its centre as shown in the figure. Determine, by Moment Area Method, the slope and deflection of the cantilever at the free end.



UNIT-V

- 9 A column 800 mm x 600 mm is subjected to an eccentric load of 60 kN as shown in figure. What are the maximum and minimum intensities of stresses in the column?



OR

- 10 A slender pin ended aluminum column 1.8 m long and of circular cross-section is to have an outside diameter of 50 mm. Calculate the necessary internal diameter to prevent failure by buckling if the actual load applied is 13.6 kN and the critical load applied is twice the actual load. Take E for aluminum as 70 GN/m².

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year I Semester Regular & Supplementary Examinations March 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 a) Explain the uses of compensating winding. L3 6M
b) A 400V 800A lap wound dc machines has 10 poles and 860 armatures conductors. calculate the number of conductors in the pole face to give full compensation if the pole face covers 60% pole span L3 6M

OR

- 2 a) Define armature reaction and Explain the demagnetizing effects of a DC Generator L3 6M
b) Explain the cross magnetizing effects of a DC Generator L3 6M

UNIT-II

- 3 a) What are the causes for failure to self-excitation of DC generator L3 6M
b) Explain the remedial Measures for failure to self-excitation of DC generator L3 6M

OR

- 4 Two 200 V dc generators each having linear external characteristic operation in parallel. One machine has a terminal voltage of 250 V on no load and 200 at a load current of 30A while the other has a voltage of 260V at no load and 20V at 50A. Calculate the output current of each machine and the bus bar voltage when the total load is 50A. what is the kW output of each machine under this condition. L4 12M

UNIT-III

- 5 Explain Ward- Leonard method of speed control. L4 12M

OR

- 6 a) Explain the field flux control method for the Speed control of a DC Motor. L3 6M
b) A 250 v dc shunt motor has armature resistance of 0.20 ohm on load it takes an armature current of 60A and runs at 800rpm. If the flux of motor is reduced by 10% without changing the load torque. L2 6M
Find the new speed of the motor.

UNIT-IV

- 7 A 250V 14.92 kW shunt motor has a maximum efficiency of 80% and a speed of 750 rpm. When delivering 80% of its rated output. The resistance of its shunt field is 100 ohm. Determine the efficiency and speed when the motor draws a current of 70A from the mains L4 12M

OR

- 8 a) Explain retardation test for DC machine in detail L3 6M
b) In retardation test on a separately excited motor the induced emf in the armature falls from 200V to 180V in 20 seconds on disconnecting the armature from the supply. The same fall takes place in 10 seconds if immediately after disconnection, armature is connected to a resistance which takes 8A during this fall. Find stray losses of the motor L3 6M

UNIT-V

- 9 Explain variable reluctance stepper motor in detail L4 12M

OR

- 10 a) Compare VR stepper motor and SRM motor L2 6M
b) Explain the advantage and disadvantage of SRM L2 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year I Semester Regular & Supplementary Examinations March 2023

SWITCHING THEORY AND LOGIC DESIGN

(ECE)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

- 1 Simplify the following Boolean expressions: i) $(X'+Z')(X+Y'+Z')$ ii) $(X'Y' + Z)'$ + $Z + XY + WZ$ iii) $A'B(D' + C'D) + B(A + A'CD)$ iv) $(A'+C)(A'+C')(A + B + C'D)$ L3 12M

OR

- 2 a) Prove De Morgan's theorems using Perfect Induction Method L3 6M
b) Simplify the given Boolean expression to a sum of 3 terms. $A'C'D' + AC' + BCD + A'CD' + A'BC + AB'C'$ L4 6M

UNIT-II

- 3 Simplify the Boolean function using Five Variable K-Map. $F = \sum m(0, 1, 2, 4, 7, 8, 12, 14, 15, 16, 17, 18, 20, 24, 28, 30, 31)$ L4 12M

OR

- 4 a) Explain the structure of Ex-OR gate by K-Map using 4 Variable L2 6M
b) Explain the Quine-McCluskey method of minimizing the Boolean functions. Also mention its limitation L2 6M

UNIT-III

- 5 a) Define Combinational Circuit and Explain the analysis procedure of a combinational logic circuit using suitable example L2 6M
b) Explain the procedure of designing a combinational logic circuit with an example L2 6M

OR

- 6 a) Design a 4 bit parallel adder/ Subtractor using full adders L4 6M
b) Design & implement a 4-bit Binary-to-Gray code converter L4 6M

UNIT-IV

- 7 Explain about the following counters in detail. i) Ring counter ii) Johnson counter L2 12M

OR

- 8 a) Derive the excitation tables for SR, D, JK, and T Flip-Flops L3 6M
b) Define a Shift register and explain its types L2 6M

UNIT-V

- 9 Explain the following related to sequential circuits with suitable examples: a) State diagram b) State table c) State assignment L2 12M

OR

- 10 a) Compare ROM and RAM L2 6M
b) Classify various types of RAMs L2 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year I Semester Regular & Supplementary Examinations March 2023

MECHANICS OF SOLIDS

(ME)

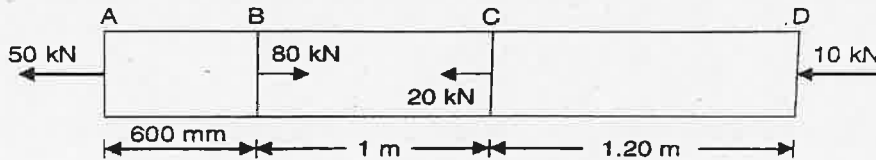
Time: 3 Hours

Max. Marks: 60

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

UNIT-I

- 1 A brass bar, having cross-sectional area of 1000 mm^2 , is subjected to axial forces as shown in figure. Find the total elongation of the bar. Take $E=1.05 \times 10^5 \text{ N/mm}^2$. L3 12M



OR

- 2 a) Explain maximum principal strain theory L1 6M
b) Explain maximum strain energy theory L1 6M

UNIT-II

- 3 Draw the shear force and bending moment diagram for a simply supported beam of length 9m and carrying a uniformly distributed load of 10 KN/m for a distance of 6 m from the left end. Also calculate the maximum bending moment in the section L3 12M

OR

- 4 a) Derive the simple bending equation L2 6M
b) A beam is simply supported and carries a uniformly distributed load of 40 KN/m run over the whole span. The section of the beam is rectangular having depth as 500 mm. If the maximum stress in the material of the beam is 120 N/mm^2 and moment of inertia of the section is $7 \times 10^8 \text{ mm}^4$, find the span of the beam. L2 6M

UNIT-III

- 5 Draw the shear stress distribution across: (a) Rectangular section. (b) Triangular section. (c) Circular section. (d) I & T Sections L5 12M

OR

- 6 A closely coiled helical spring made of 10 mm diameter steel wire has 15 coils of 100 mm mean diameter. The spring is subjected to an axial load of 100 N. Calculate : (i) The maximum shear stress induced, (ii) The deflection, and (iii) Stiffness of the spring. (iv) Take modulus of rigidity, $C = 8.16 \times 10^4 \text{ N/mm}^2$ L3 CO3 12M UNIT I

UNIT-IV

- 7 Derive the relation between slope, deflection and radius of curvature L1 12M

OR

- 8 Using Euler's formula, calculate the critical stresses for a series of struts having slenderness ratio of 40, 80, 120, 160 and 200 under the following conditions : (i) Both ends hinged and (ii) Both ends fixed. Take $E = 2.05 \times 10^5 \text{ N/mm}^2$ L3 12M

UNIT-V

- 9 Determine the maximum and minimum hoop stress across the section of a pipe of 400 mm internal diameter and 100 mm thick, when the pipe contains a fluid at a pressure of 8 N/mm^2 . Also sketch the radial pressure and hoop stress distribution across the section. L3 12M

OR

- 10 a) Derive expression for circumferential stress in thin cylinder. L3 6M
b) A cylindrical pipe of diameter 1.5m and thickness 1.5cm is subjected to an internal fluid pressure of 1.2 N/mm^2 . Determine: i) Longitudinal stress developed in the pipe, and ii) Circumferential stress developed in the pipe. L3 6M

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

1 Describe the List and its Methods with example. L3 12M

OR

2 a) What is Set? Explain set operations. L3 6M

b) What is Dictionary? Explain the Methods available in Dictionary. L2 6M

UNIT-II

3 Classify various types of Operators in Python and write any 4 types of Operators. L3 12M

OR

4 a) Discuss the Membership and Identity operators with example. L2 6M

b) write a python program to find biggest number among three numbers L2 6M

UNIT-III

5 a) Define function and explain the types of functions with an example. L5 6M

b) Discuss about key word arguments with example. L5 6M

OR

6 a) Create Recursive function to find factorial of a number. L5 6M

b) Express function to do all arithmetic operations. L2 6M

UNIT-IV

7 What is package in Python? Explain the use of packages in your program with an example code. L1 12M

OR

8 a) Write a python code using try-except-else-finally statement in python. L2 6M

b) Illustrate matching with example program. L3 6M

UNIT-V

9 Express about Mathematical functions in python. L3 12M

OR

10 a) What is Data Management and Object Persistence? Explain in detail. L3 6M

b) Describe the Turtle using python program. L3 6M

Q.P. Code: 20CS0506

R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year I Semester Regular & Supplementary Examinations March 2023

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

(CSE)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

- 1 a) What is meant by paradigm? List the programming paradigms. L3 6M
b) How type casting implemented in java? Explain with an example L2 6M

OR

- 2 a) State what is a variable? Give the declaration of variable in java and specify the rules to be followed over the same? L1 6M
b) Create a java program to read and display the array elements. L6 6M

UNIT-II

- 3 a) Create and explain java program for the implementation of single, multi-level and hierarchical inheritance L3 6M
b) Distinguish method Overriding and method Overloading L5 6M

OR

- 4 a) Illustrate Garbage collector in Java and explain the behavior when used L3 6M
b) Differentiate between the usages of static, final keywords with example. L4 6M

UNIT-III

- 5 a) Illustrate about try, catch, and throw statements using a java program L3 6M
b) Explain about Nested try statements with an example. L2 6M

OR

- 6 a) Discriminate what is Daemon threads and its implementation with an example. L5 6M
b) Illustrate the ways to create multiple threads in java. L2 6M

UNIT-IV

- 7 a) List and describe about collection class in java. L1 6M
b) Discuss about the file input stream and file output stream in java with examples. L2 6M

OR

- 8 a) Interpret how to create a file in java with example program. L2 6M
b) Develop a java program to show read and write a file in java with an example program. L3 6M

UNIT-V

- 9 a) Write the features of swing in java. L3 6M
b) Discuss about swing controls with examples. L2 6M

OR

- 10 a) Distinguish between AWT and SWING? L3 6M
b) Interpret the usage of Date and Time API with an example program. L3 6M

BUILDING TECHNOLOGY

(CE)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

1 What is masonry? Describe briefly the different terms used in masonry. L1 12M

OR

2 a) Define foundation. What are the essentials of a good foundation? L1 6M

b) Write the objectives of foundations and list the types of foundations. L1 6M

UNIT-II

3 Draw a neat sketch of an arch and explain various technical terms used in its Construction. L2 12M

OR

4 a) Define Plastering. What are the objectives or requirements of Plastering? L1 6M

b) Write short notes on types of mortars for plastering. L1 6M

UNIT-III

5 a) Write short notes on the location of doors and windows L1 6M

b) List out types of doors and explain briefly about Framed and Panelled doors with neat sketches. L2 6M

OR

6 a) State briefly the essential requirements of a good roof. L2 6M

b) Explain in brief, with neat sketches L2 6M

i) Madras Terrace roof

ii) Bengal Terrace roof

UNIT-IV

7 Summarize the fire-resisting properties of common building materials. L2 12M

OR

8 a) What are the functional requirements of a good ventilating system? L1 6M

b) Describe briefly various types of filters for Air-conditioning. L1 6M

UNIT-V

9 Describe briefly the factors to be considered for planning lift installation in various civil engineering structures. L2 12M

OR

10 a) Write the importance of security installations for various buildings. L3 6M

b) Describe briefly micro switch and magnetic reed detectors. L2 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B. Tech II Year I Semester Regular & Supplementary Examinations March 2023

GENERATION OF ELECTRICAL POWER

(EEE)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

- 1 a) What are the differences between thermal and hydro power plant L2 6M
b) What are the factors considered, while selecting the site for a thermal power station? L1 6M

OR

- 2 a) Explain the function of the following in thermal power plant. L3 6M
a) Economizer b) Electrostatic Precipitator c) Condenser
b) Write a short note on (i) Surge tank (ii) Penstock L2 6M

UNIT-II

- 3 Write short note on a) FBR b) PWR L2 12M

OR

- 4 Compare thermal, hydro and nuclear power plants on the basis of technical, mechanical and economical aspects. L3 12M

UNIT-III

- 5 a) Explain Pitch and Yaw control in wind turbine. L2 6M
b) What are the merits and demerits wind power systems L1 6M

OR

- 6 a) What is solar energy storage? Explain their methods. L3 12M

UNIT-IV

- 7 a) How biomass conversion takes place? L2 6M
b) Explain any one type of biogas digester with neat diagram and their advantages and disadvantages L1 6M

OR

- 8 a) Explain the factors affecting bio-digestion of gas L2 6M
b) Write some applications of biogas L3 6M

UNIT-V

- 9 Write short notes on the following (a) Load factor (B) Demand Factor (C) Diversity factor? L3 12M

OR

- 10 A Generating station has the following daily load cycle L3 12M
Time (hrs) 0-6 6-10 10-12 12-16 16-20 20-24

Load (MW) 30 40 20 70 50 40

Draw the load curve and find i) Maximum demand ii) Units generated per day iii) Average load and load factor.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II B.Tech I SEM Regular & Supplementary Examinations of March-2023
SIGNALS, SYSTEMS AND RANDOM PROCESSES
(ECE)

Time: 3 Hours

Max. Marks: 60

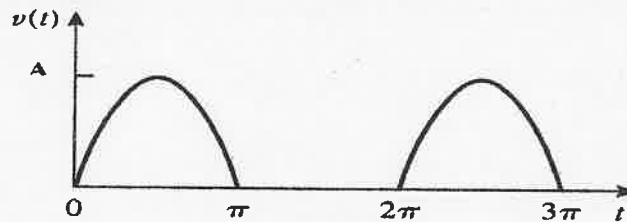
Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- 1 Define a System. Classify the Systems with an example for each. L3 12M
- OR
- 2 a) Sketch the different signals. L3 6M
b) Determine whether the following systems are stable or not. L2 6M
(i) $y(t) = (t+5)u(t)$ (ii) $h(n) = a^n$ for $0 < n < 11$

UNIT-II

- 3 Construct the Trigonometric Fourier series expansion of the half wave rectified sine wave shown in figure. L3 12M



OR

- 4 a) State and Prove the Linearity, Time Shifting, Time Reversal and Time Convolution Properties of Fourier series. L2 8M
b) Explain the representation of a signal in exponential Fourier series. L2 4M

UNIT-III

- 5 a) State and prove the frequency convolution theorem with Fourier transforms. L5 6M
b) Define Convolution. State and prove the time convolution theorem with Find the convolution of the following signal $x_1(t) = e^{-2t}u(t)$, $x_2(t) = e^{-4t}u(t)$. L5 6M

OR

- 6 a) Derive the Transfer function of LTI system. L5 6M
b) Examine the convolution of the following signals by graphical method. L2 6M
 $x(t) = e^{-3t}u(t)$ and $h(t) = u(t+3)$

UNIT-IV

- 7 Illustrate the inverse Laplace transform of the following. L1 12M
(i) $X(s) = 1/s(s+1)(s+2)(s+3)$ (ii) $X(s) = s/(s+3)(s^2+6s+5)$

OR

- 8 a) Derive the relation between Laplace Transform and Fourier Transform of a signal. L2 6M
b) Explain the concept of Joint probability. L3 6M

UNIT-V

- 9 Define and Differentiate the Distribution and Density functions of a Random Process. Prove that the Power Spectral Density of the derivative $X(t)$ is equal to ω^2 times the Power Spectral Density of $S_{XX}(\omega)$. L3 12M

OR

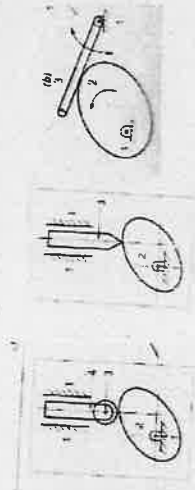
- 10 a) Define and explain Stationary and Statistical Independence of Random process L3 6M
b) If the Power Spectral Density of $x(t)$ is $S_{XX}(\omega)$ then find the Power Spectral Density of $dx(t)/dt$. L3 6M

UNIT-I

- 1 a) Define the following terms
(i) Lower and Higher pairs (ii) Degree of freedom
- b) Find the degrees of freedom for the following linkages.

L3 6M

L3 6M



OR

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

L3 12M

UNIT-II

- 3 With neat sketch, explain the working of any two of exact straight line mechanisms

L3 12M

OR

- 4 a) Differentiate between the Davis and Ackerman's steering mechanism
- b) List out the merits and demerits of Davis steering gear mechanism

L2 6M

L2 6M

UNIT-III

- 5 In Fig 7.9, the angular velocity of the crank OA is 600 r.p.m. Determine the linear velocity of the slider D and the angular velocity of the link BD, when the crank is inclined at an angle of 75° to the vertical. The dimensions of various links are: OA = 28 mm; AB = 44 mm; BC = 49 mm; and BD = 46 mm. The center distance between the centres of rotation O and C is 65 mm. The path of travel of the slider is 11 mm below the fixed point C. The slider moves along a horizontal path and OC is vertical

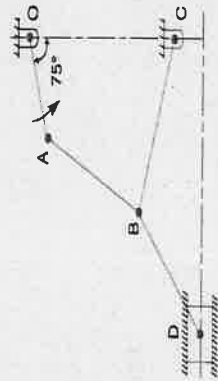


Fig. 7.9

OR

- 6 a) What do you understand by the instantaneous centre of rotation in kinematic of machines? Answer briefly. L5 6M
- b) Explain the following terms: (a) Instantaneous center (b) Body center and space centrode (c) Axode L2 6M

UNIT-IV

- 7 a) Construct the displacement, velocity and acceleration diagrams for a follower when it moves with simple harmonic motion. L1 6M
- b) Construct the displacement, velocity and acceleration diagrams for a follower when it moves with uniform Acceleration and retardation. L1 6M

OR

- 8 A cam drives a flat reciprocating follower in the following manner: During first 120° rotation of the cam, follower moves outwards through a distance of 20 mm with simple harmonic motion. The follower dwells during next 30° of cam rotation. During next 120° of cam rotation, the follower moves inwards with simple harmonic motion. The follower dwells for the next 90° of cam rotation. The minimum radius of the cam is 25 mm. Draw the profile of the cam. L2 12M

UNIT-V

- 9 What do you understand by the term 'interference' as applied to gears? Define the following terms relates to transmission of motion L3 12M
- (i) Gear tooth contact ratio (ii) Condition for constant velocity ratio

OR

- 10 In an epicyclic gear train, an arm carries two gears A and B having 36 and 45 teeth respectively. If the arm rotates at 150 r.p.m. In the anticlockwise direction about the center of the gear A which is fixed, determine the speed of gear B. If the gear A instead of being fixed, makes 300 r.p.m. in the clockwise direction, what will be the speed of gear B? L3 12M

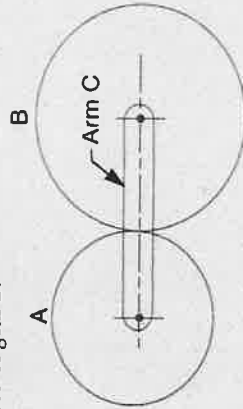


Fig. 13.7

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

- 1 a) Distinguish distributed operating system with embedded operating system. L2 6M
b) Define System call, List different types of system calls L1 6M

OR

- 2 a) What is operating system? Explain multi programming and time-sharing operating systems. L1 6M
b) Discuss the concept of virtual machines. L3 6M

UNIT-II

- 3 a) Compute the average waiting time for the processes using non preemptive SJF scheduling algorithm L3 6M

Process	Arrival Time	Burst Time
P1	0	7
P2	2	4
P3	4	1
P4	5	4
P5	3	4

- b) What is threading and multithreading in OS? L1 6M

OR

- 4 a) Define Process? Describe process States with neat diagram. L1 6M
b) Name and draw five different process states with proper definition. L1 6M

UNIT-III

- 5 a) What are the different techniques of mutual exclusion? L2 6M
b) Explain the solution for Producer Consumer Problem. L2 6M

OR

- 6 a) Write Short notes on Dead Lock Characteristics. L3 6M
b) Explain Banker's Algorithm? L2 6M

UNIT-IV

- 7 Discuss in detail virtual memory. L1 12M

OR

- 8 a) Discuss page replacement with example. L4 6M
b) Describe the advantages and disadvantages of swapping. L2 6M

UNIT-V

- 9 Justify free space management in Operating System? L6 12M

OR

- 10 a) Define Authentication? explain types of authentications L1 6M
b) Explain about secret key and public key cryptography. L2 6M

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

UNIT-I

- 1 The space b/w two square parallel plates filled with oil. Each side of the plate is 60 cm. The thickness of oil film is 12.5. The upper plate which moves at 2.5m/sec requires a force 98.1 N to maintain the speed. Determine the
- L3 12M
- i) Dynamic viscosity of oil in poise.
ii) Kinetic viscosity of the oil in stokes, If the specific gravity of the oil 0.95

OR

- 2 a) State Pascal's law and Derive pressure variation in liquid at rest? L2 6M
b) Derive the Expression for Total Pressure of vertical plane surface. L2 6M

UNIT-II

- 3 Derive Continuity Equation in 3-Dimensional flow? L3 12M

OR

- 4 The Velocity Potential function (ϕ) is given by an expression L3 12M

$$\phi = \frac{-xy^3}{3} - x^2 + \frac{x^3y}{3} + y^2$$

- i. Find the velocity components in x and y direction.
ii. Show that ϕ remains represents the possible case of flow.

UNIT-III

- 5 Derive the Bernoulli's energy equation with assumptions. L3 12M

OR

- 6 a) Water flows through right angled weir first and then over a rectangular weir of width 1m. The discharge coefficient of the triangular and rectangular weirs are 0.6 and 0.7. If the depth of water over triangular weir is 360mm. find the depth of water of rectangular weir. L3 6M
b) Derive the Expression for velocity measurement by Pitot tube. L2 6M

UNIT-IV

- 7 A main pipe divides into two parallel pipes which again forms one pipe as shown in figure. Above the length & dia for the first parallel pipe are 2000m & 1.0m respectively. While the length & dia of 2nd parallel pipe are 2000m & 0.8m. Find the rate of flow in each parallel pipe if total flow in the main is 3.0 m³ /s. the coefficient of friction for each parallel pipe is same & equal to 0.005? L3 12M

OR

- 8 Briefly explain about Hardy cross method? L2 12M

UNIT-V

- 9 What is dimensionless number? Explain different types of numbers. L3 12M

OR

- 10 A Pipe line carrying water has average height of irregularities projecting from the surface of the boundary of the pipe as 0.15mm. What type of boundary is it? The shear stress developed is 4.9 N/M². The kinematic viscosity of water is 0.01 Stokes. L3 12M

B.Tech II Year I Semester Regular & Supplementary Examinations March 2023
ELECTROMAGNETIC FIELDS

(EEE)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

1 A vector field S is expressed in rectangular coordinates as $S = \{125/[(x-1)^2 + (y-2)^2 + (z+1)^2]\}\{(x-1)a_x + (y-2)a_y + (z+1)a_z\}$. (a) Evaluate S at $P(2, 4, 3)$. (b) Determine a unit vector that gives the direction of S at P . (c) Specify the surface $f(x, y, z)$ on which $|S| = 1$. L3 12M

OR

- 2 a) The three vertices of a triangle are located at $A(6, -1, 2)$, $B(-2, 3, -4)$, and $C(-3, 1, 5)$. Find: (a) R_{AB} ; (b) R_{AC} L3 6M
b) Transform the vector field $W = 10a_x - 8a_y + 6a_z$ to cylindrical co-ordinate system at point $P(10, -8, 6)$. L3 6M

UNIT-II

3 Find V at $P(2, 1, 3)$ for the field of two coaxial conducting cones, with $V = 50$ V at $\theta = 30^\circ$ and $V = 20$ V at $\theta = 50^\circ$. L3 12M

OR

- 4 a) A charge of $-0.3\mu\text{C}$ is located at $A(25, -30, 15)$ (in cm), and a second charge of $0.5\mu\text{C}$ is at $B(-10, 8, 12)$ cm. Find E at: (a) the origin; (b) $P(15, 20, 50)$ cm. L3 8M
b) What is the relation between electric flux density and electric field intensity. L1 4M

UNIT-III

5 Two parallel conducting discs are separated by distance 5 mm at $z=0$ and $z=5$ mm. If $V=0$ and $V=100$ v at $z=5$ mm, find the charge densities on the disc. L3 12M

OR

- 6 a) Find the polarization in dielectric material with $\epsilon_r = 2.8$ if $D = 3 \times 10^{-7}$ C/m². L3 6M
b) Derive Laplace's and Poisson's Equation. L4 6M

UNIT-IV

7 Derive the expression for self-inductance of solenoid, toroid and Coaxial cable L4 12M

OR

- 8 a) Evaluate both sides of Stokes' theorem for the field $H = 6xya_x - 3y^2a_y$ A/m and the rectangular path around the region, $2 \leq x \leq 5$, $-1 \leq y \leq 1$, $z = 0$. Let the positive direction of dS be a_z . L3 7M
b) Explain maxwell's second equation? L2 5M

UNIT-V

9 Explain faradays law of electromagnetic induction and there from derive maxwell's eq: ation in differetial and integral form? L4 12M

OR

10 A Parallel plate capacitor with plate area of 5 cm^2 and plate separation of 3 mm has a Voltage of $50 \sin 10^3 t$ volts applied to its plates. Calculate the displacement current Assuming $\epsilon = 2\epsilon_0$ L3 12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year I Semester Regular & Supplementary Examinations March 2023

ANALOG COMMUNICATIONS

(ECE)

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 elements of a communication system. L1 8M
b) The total power content of an AM signal is 1000W. Determine the power being transmitted at the carrier frequency and at each of the side bands when the percentage of modulation is 100. L5 4M

OR

- 2 a) Explain the need for modulation. L2 4M
b) With a neat circuit diagram and waveforms, explain the operation of square-law detector. L2 8M

UNIT-II

- 3 a) What is a DSB-SC modulator? Explain how the ring modulator for generation of DSB-SC acts as a demodulator L2 8M
b) Give the comparison of AM techniques. L5 4M

OR

- 4 a) With a neat block diagram and necessary equations explain the operation of ring modulator. L2 7M
b) The power of an SSB transmission is 5KW. The transmission is to be replaced by a standard AM signal with the same power content. Calculate the power content of the carrier and each of the side bands when the percentage modulation is 70%. L3 5M

UNIT-III

- 5 a) Explain how a PLL can be used as FM demodulator. L2 6M
b) The equation for an FM wave is $s(t) = 10 \sin [5.7 \times 10^8 t + 5 \sin 12 \times 10^3 t]$. Calculate: (i) Carrier frequency (ii) Modulation index and (iii) Frequency deviation. L3 6M

OR

- 6 a) Discuss in brief about Narrow band FM and Wide band FM. L2 8M
b) Write a brief note on FM capture effect. L1 4M

UNIT-IV

- 7 Explain the performance analysis of AM, DSB-SC, SSB-SC, FM and PM in the presence of noise. L2 12M

OR

- 8 a) Write short notes on the following: L1 6M
(i) Sensitivity (ii) Selectivity (iii) Fidelity
b) A super heterodyne receiver is tuned to receive 1000 KHz carrier amplitude modulated by 1KHz sine wave. Assuming IF frequency to be 455 KHz, list the frequency components at the input and output of the IF amplifier. Assume the IF bandwidth to be 10 KHz. L1 6M

UNIT-V

- 9 a) With a neat sketch explain how PAM waveform is obtained by the sample-and-hold technique. L2 8M
b) An analog signal is band limited to 'B' Hz and sampled at Nyquist rate. The samples are quantized into 4 levels. Each level represents one message. The probabilities of occurrence of these 4 levels (messages) are $P_1 = P_4 = 1/8$ and $P_2 = P_3 = 3/8$. Find out information rate of source. L5 4M

OR

- 10 a) Explain about Shannon's encoding algorithm. L2 6M
b) Compare PAM, PWM and PPM systems. L5 4M
c) What is the use of Shannon's encoding algorithm? L1 2M

B.Tech II Year I Semester Regular & Supplementary Examinations March 2023
THERMAL ENGINEERING
(ME)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

- 1 A single acting reciprocating air compressor has a piston diameter of 200mm and a stroke of 300mm runs at 350rpm. Air is drawn at 1.1 bar pressure and it is delivered at 8 bar pressure. The law of compression is $p v^{1.35} = \text{constant}$ and clearance volume is 6% of the stroke volume. Determine the mean effective pressure and power required to drive the compressor. L3 12M

OR

- 2 a) Explain the construction and working principle of centrifugal compressor with neat sketches. L2 6M
b) Derive an expression for minimum work required for two stage reciprocating air Compressor with perfect inter-cooling and neglect clearance volume. L3 6M

UNIT-II

- 3 In a Gas turbine plant, the air is compressed in a single stage compressor from 1 bar to 9 bar and from an initial temperature of 300K. The same air is then heated to a temperature of 800K and then expanded in the turbine. The air is then reheated to a temperature of 800K and then expanded in the second turbine. Find the maximum power that can be obtained from the installation, if the mass of air circulated per second is 2Kg. Take $C_p = 1 \text{ KJ/Kg}$. L3 12M

OR

- 4 a) Explain the working of Open Cycle Brayton cycle with neat sketch. L2 6M
b) Explain Reheat and Intercooling Brayton cycle with neat sketch. L2 6M

UNIT-III

- 5 Derive an expression for condition of maximum discharge through a nozzle. L3 12M

OR

- 6 Steam enters a convergent divergent nozzle at 2 MPa and 400°C with a negligible velocity and mass flow rate of 2.5 kg/s and it exits at a pressure of 300 kPa. The flow is isentropic between the nozzle entrance and throat and overall nozzle efficiency is 93 percent. Determine (a) throat, and (b) exit area. L3 12M

UNIT-IV

- 7 In a De-Laval turbine, steam issues from the nozzle with a velocity of 1200m/s. The nozzle angle is 20°, the mean blade velocity is 400m/s. The inlet and outlet angles of blades are equal. The Mass of steam flowing through turbine per hour is 1200kg. Calculate Force on blade and Power developed. L3 12M

OR

- 8 In a impulse turbine steam issues from the nozzle with a velocity of 1200 m/s. The nozzle angle is 20°, the mean blade velocity is 375 m/s, the inlet and outlet angles of blades are equal. The mass of steam flowing through the turbine per hour is 0.5 kg/s. Calculate (i) Blade angles, (ii) Relative velocity of steam entering the blades, (iii) Tangential force on the blades, (iv) Power developed, (v) Blade efficiency, Take blade velocity co-efficient as 0.8. L3 12M

UNIT-V

- 9 During a test on single cylinder 4-stroke cycle oil engine, the following data were obtained. Stroke volume = 0.0227 m³, Mean effective pressure = 5 bar, Engine speed = 4000 rpm, Brake torque = 67.6 N-m, Fuel used per hour = 37.3 kg, CV of fuel = 43000 kJ/kg. Calculate, Indicated power, Brake power, Indicated thermal efficiency, Brake thermal efficiency, and Mechanical efficiency. L3 12M

OR

- 10 a) Explain the theoretical and actual port timing diagram for two-stroke petrol engine. L2 6M
b) Explain the working principle of four-stroke diesel engine. L2 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year I Semester Regular & Supplementary Examinations March 2023

HUMAN VALUES AND PROFESSIONAL ETHICS

(CSE, CIA, CSM, CAD & CE)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

1 Explain the importance of Human Values required for Engineers? L3 12M

OR

2 a) Analyse how Yoga and Meditation help to achieve professional excellence. L3 6M

b) Discuss the role of Caring, Commitment and Co-operation as Human Values. L2 6M

UNIT-II

3 Enumerate the various Approaches in Engineering Ethics that help to settle the Ethical issues. L3 12M

OR

4 a) Discuss any two Theories followed in Engineering Ethics. L2 6M

b) What are the different types of inquiry? L2 6M

UNIT-III

5 a) Attempt a paragraph on a Balanced Outlook on Law. L5 6M

b) Explain the important Codes of Ethics. L5 6M

OR

6 a) How are Engineers treated as responsible Experimenters? L5 6M

b) Define the term, 'Standardization' and the features of the Standards. L2 6M

UNIT-IV

7 Elaborate on Safety, Responsibilities and Rights in Engineering. L1 12M

OR

8 a) What is meant by Conflicts of Interest? L2 6M

b) Explain the special features of Intellectual Property Rights. L3 6M

UNIT-V

9 Why should Engineers have environmental concerns to protect Environmental Ethics? L3 12M

OR

10 a) Explain the terms: Financial bias, Ego bias and Sympathy bias. L3 6M

b) How do Engineers manage Computer Ethics? L3 6M

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

- 1 a) What are the assumptions made in the limit state of collapse in flexure? L1 5M
 b) A singly reinforced concrete beam 300 x 550 mm is reinforced with 5 bars of 16 mm diameter with an effective cover of 50 mm. The beam is simply supported over a span of 5 m. Find the safe uniformly distributed load the beam can carry? Use M20 grade concrete and Fe 415 grade steel. L3 7M

OR

- 2 A T-beam of effective flange width of 740 mm, thickness of slab 100 mm, width of rib 240 mm and effective depth 400 mm is reinforced with 5 numbers of 20 mm diameter bars. Determine the moment of resistance of the section? The materials used are M15 grade concrete and Fe250 grade steel. L3 12M

UNIT-II

- 3 Design a dog-legged stair for a building in which the vertical distance between floors is 3.3 m. Adopt rise and tread of each step are 150 mm and 225 mm respectively. The stair hall measures 2.5 m x 4.5 m. The live load may be taken as 3 kN/m² and floor finish is 0.6 kN/m². Use M20 grade concrete and Fe415 grade steel. Assume the stairs are supported on 230 mm walls at the ends of outer edges of landing slabs. L3 12M

OR

- 4 Design a reinforced concrete slab to carry a live load of 3 kN/m² on an effective span of 3.5 m. Use M20 grade concrete and Fe415 grade steel. Assume floor finish is 1 kN/m². L3 12M

UNIT-III

- 5 Design the longitudinal and lateral reinforcement in a rectangular reinforced concrete column of size 300 mm x 400 mm subjected to a design ultimate load of 1200 kN and an ultimate moment of 200 kN-m with respect to the major axis. Use M20 grade concrete and Fe415 HYSD bars. L3 12M

OR

- 6 A reinforced concrete column of size 300 mm x 300 mm carries a load of 750 kN. The safe bearing capacity of soil is 200 kN/m². Design an isolated column footing with uniform thickness. Use M20 grade concrete and Fe415 steel. L3 12M

UNIT-IV

- 7 a) A 18 mm thick plate is joined to 16 mm plate by 200 mm long (effective) butt weld. Determine the strength of joint if (i) A Double V butt weld is used and (ii) A Single V butt weld is used? L3 6M
 b) Explain with neat sketches the different modes of failure of welded connections. L2 6M

OR

- 8 Design a double angle tension member connected on each side of a 10 mm thick gusset plate to carry an axial factored load of 375 kN. Use 20 mm black bolts, Assume shop Connection. L3 12M

UNIT-V

- 9 A column 4 m long has to support a factored load of 6000 kN. The column is effectively held at both ends and restrained in direction at one of the ends. Design the column using beam sections and plates. L3 12M

OR

- 10 Design a simply supported beam of 10 m effective span carrying a total factored load of 60 kN/m. The depth of beam should not exceed 500 mm. The compression flange of the beam is laterally supported by floor construction. Assume stiff end bearing is 75 mm. L3 12M

Time: 3 Hours

(EEE)

Max. Marks: 60

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

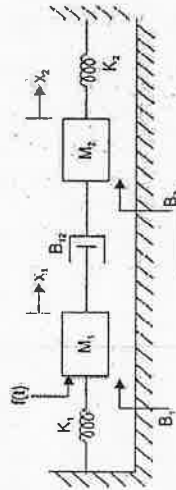
- 1 a) Define the Open loop and Closed loop control systems with examples. L1 6M
 b) Compare open loop and closed loop control systems based on different aspects L2 6M

UNIT-I

OR

- 2 Define the Transfer function. Determine the transfer function, $\frac{X_1(s)}{F(s)}$ and $\frac{X_2(s)}{F(s)}$ L1 12M

$\frac{X_1(s)}{F(s)}$ for the system shown in the Fig.



UNIT-II

- 3 a) What is the Time response? Explain the standard test input signals with neat sketch. L1 6M
 b) List out the time domain specifications and derive the expressions for Rise time, Peak time and Peak overshoot. L2 6M

OR

- 4 a) Find all the time domain specifications for a unity feedback control system whose open loop transfer function is given by $G(s) = \frac{15}{s(s+4)}$ L2 6M

- b) What is the Transient and steady state response of first and second order systems? L1 6M

UNIT-III

- 5 a) What is the stability of the system? Explain the procedure for Routh Hurwitz stability criterion. L5 4M
 b) With the help of Routh's stability criterion find the stability of the following systems represented by the characteristic equations: L5 8M

- a) $s^4 + 5s^3 + 18s^2 + 16s + 5 = 0$
 b) $s^6 + 2s^5 - 8s^4 + 12s^3 + 20s^2 + 16s + 16 = 0$

OR

- 6 With the help of Routh's stability criterion determine the stability of the following systems represented by the characteristic equations: L2 12M

- a) $s^5 + s^4 + 2s^3 + 2s^2 + 3s + 5 = 0$
 b) $5s^5 - 20s^4 + 10s^3 - s^2 - 9s - 10 = 0$

UNIT-IV

- 7 List out the frequency domain specifications and derive the expressions for resonant peak. L2 12M

OR

- 8 Develop the Bode plot for the following transfer function and determine the system phase and gain cross over frequencies L4 12M

$$G(s) = \frac{10}{s(1+0.4s)(1+0.1s)}$$

UNIT-V

- 9 Determine the Solution for Homogeneous and Non homogeneous State equations. L5 12M

OR

- 10 a) What are the properties of State Transition Matrix? L1 6M

b)

$$A = \begin{bmatrix} 0 & 6 & -5 \\ 1 & 0 & 2 \\ 3 & 2 & 4 \end{bmatrix}$$

Diagonalize the following system matrix

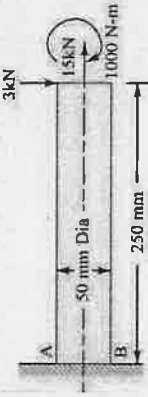
Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 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.



OR

- 2 a) Explain the bending stress relation and draw the diagram.
b) A hydraulic press exerts a total load of 3.5 MN. This load is carried by two steel rods, supporting the upper head of the press. If the safe stress is 85 MPa and $E = 210 \text{ kN/mm}^2$, find : 1. diameter of the rods, and 2. extension in each rod in a length of 2.5m.

UNIT-II

- 3 The load on a bolt consists of an axial pull of 10 kN together with a transverse shear force of 5 kN. Find the diameter of bolt required according to 1. Maximum principal stress theory 2. Maximum shear stress theory 3. Maximum principal strain...theory. 4. Maximum strain energy theory; and 5. Maximum distortion energy theory.

OR

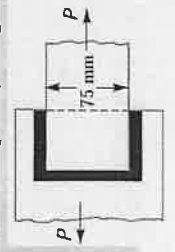
- 4 a) List various theories of failures and discuss about them in brief.
b) A mild steel rod of 12 mm diameter was tested for tensile strength with the gauge length of 60 mm. Following observations were recorded : Final length = 80 mm; Final diameter = 7 mm; Yield load = 3.4 kN and Ultimate load = 6.1 kN. Calculate: 1. Yield stress, 2. Ultimate tensile stress, 3. Percentage reduction in area, and 4. Percentage elongation.

UNIT-III

- 5 a) Explain Stress in screw fasteners due to Combined Forces?
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

OR

- 6 a) 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



- b) A plate 100 mm wide and 10 mm thick is to be welded to another plate by means of double parallel fillets. The plates are subjected to a static load of 80 kN. Find the length of weld if the permissible shear stress in the weld does not exceed 55 MPa.

UNIT-IV

- 7 Design a gib and cotter joint to carry a maximum load of 35 kN. Assuming that the gib, cotter and rod are of same material and have the following allowable stresses : $\sigma = 20 \text{ MPa}$; $\tau = 15 \text{ MPa}$; and $\sigma_c = 50 \text{ MPa}$.

OR

- 8 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
b) A steel spindle transmits 4 kW at 800 r.p.m. The angular deflection should not exceed 0.25° per metre of the spindle. If the modulus of rigidity for the material of the spindle is 84 GPa, find the diameter of the spindle and the shear stress induced in the spindle.

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 MPa Crushing stress for bolt and key = 80 MPa Shear stress for cast iron = 8 MPa Draw a neat sketch of the coupling.

OR

- 10 a) What are the forces acting on sunk key? Explain with neat sketch
b) 15 kW, 960 r.p.m. motor has a mild steel shaft of 40 mm diameter and the extension being 75 mm. The permissible shear and crushing stresses for the mild steel key are 56 MPa and 112 MPa. Design the keyway in the motor shaft extension. Check the shear strength of the key against the normal strength of the shaft

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular Examinations March 2023

ELECTROMAGNETIC THEORY AND TRANSMISSION LINES

(ECE)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

- 1 a) Discuss the salient features and limitations of Gauss's Law. L2 6M
b) A circular ring of radius 'a' carries uniform charge ρ_L C/m and is in xy-plane. L3 6M
Find the Electric Field at Point (0, 0, 2) along its axis.

OR

- 2 a) Derive an expression for energy density in electrostatic field. L3 6M
b) Point charges 1 mC and - 2 mC are located at (3, 2, - 1) and (-1, -1, 4), L3 6M
respectively. Calculate the electric force on a 10 nC charge located at (0, 3, 1) and
the electric field intensity at that point.

UNIT-II

- 3 State Ampere's circuit law. A hollow conducting cylinder has inner radius a and L3 12M
outer radius b and carries current I along the positive z-direction. Find H
everywhere.

OR

- 4 a) Obtain the expressions for energy density and energy stored in static magnetic L2 6M
field.
b) If magnetic field, $H = 3a_x + 2a_y$ A/m exists at a point in free space, what is L3 6M
magnetic flux density at that point.

UNIT-III

- 5 a) In free space, $H = 10 \sin(\omega t - 100x)a_y$ A/m. Calculate E L3 6M
b) Deduce the Expression for Moving loop in Time varying Fields L2 6M

OR

- 6 Why Ampere's law is inconsistent? Derive an expression for inconsistency of L4 12M
Ampere's law.

UNIT-IV

- 7 a) Explain about Poynting theorem and its applications. L2 6M
b) Evaluate the wave characteristics of plane wave in lossless dielectric medium. L4 6M

OR

- 8 Derive the expressions for reflection coefficient and transmission coefficient for L4 12M
reflection of plane wave at oblique in perpendicular polarization

UNIT-V

- 9 a) What is distortion in a transmission line? Derive the condition for distortion less L2 6M
transmission
b) A distortion less transmission line has $Z_0 = 100 \Omega$, $\alpha = 0.5$ dB/m, $v = 0.8 v_0$. Find L3 6M
out R , L , G , C and wavelength at 0.1 GHz.

OR

- 10 Determine the equation for Input Impedance of the transmission line. L3 12M

DIGITAL COMMUNICATIONS

(ECE)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

- 1 a) With a neat block diagram explain PCM transmitter and receiver. L2 6M
b) Discuss the Noise considerations in PCM systems. L2 6M

OR

- 2 a) Explain the DPCM system with neat diagram. L2 6M
b) Explain the DM (delta modulation system) with suitable diagrams. L2 6M

UNIT-II

- 3 Explain in detail about Inter symbol interference and its effects. L2 12M

OR

- 4 a) Explain in detail about modified duo binary signaling scheme. L2 6M
b) Describe the baseband M-array PAM Transmission system. L2 6M

UNIT-III

- 5 a) Draw the block diagram of a most basic form of digital communication system. L1 6M
b) Illustrate optimum receiver for AWGN channel. L2 6M

OR

- 6 a) Explain the concept of AWGN channel. L2 6M
b) With a neat sketch explain the working of correlation receiver. L2 6M

UNIT-IV

- 7 Draw the block diagram of QPSK transmitter & receiver and explain each block in detail. L5 12M

OR

- 8 a) Compare all the digital modulation techniques. L2 6M
b) Derive the probability of error for a coherent QPSK system. L3 6M

UNIT-V

- 9 Define the following terms L1 12M
i. Code efficiency iii. Hamming Distance
ii. Code vectors iv. Constraint length.

OR

- 10 a) What is forward error correction system and explain in detail? L1 6M
b) Describe the matrix representation of linear block codes. L5 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B. Tech III Year I Semester Regular Examinations March 2023

COMPILER DESIGN

(CSE)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

- 1 Explain the different phases of the Compiler, showing the output of each phase using an example for the statement $z = (a*20) + b - c$ L2 12M

OR

- 2 a) Give the reasons for separating Lexical analysis and Syntax analysis into two Phases L4 4M
b) Write a LEX program for identifying the key words and identifiers from the file L5 8M

UNIT-II

- 3 State whether the grammar is LL(1) or not. L5 12M
 $P \rightarrow D;S \quad D \rightarrow D;D/a/\epsilon \quad S \rightarrow S;S/b$

OR

- 4 a) Define left recursion? How to remove Left recursion from the given grammar : $S \rightarrow Aa / b \quad A \rightarrow Ac / Sd / e$ L1 6M
b) Eliminate ambiguity from the following grammar L3 6M
 $E \rightarrow E+E/E^*E/(E)/id$

UNIT-III

- 5 a) Distinguish static and dynamic type checking L5 4M
b) Construct SLR parsing table for the given grammar and check whether "id or id and id" is a valid string or not. L3 8M
 $E \rightarrow E \text{ or } T \quad E \rightarrow T \quad T \rightarrow T \text{ and } F \quad T \rightarrow F \quad F \rightarrow id$

OR

- 6 a) How Syntax Directed Translation is used for translation of expressions? L5 4M
b) Construct the LALR parsing table for the grammar. $S \rightarrow CC \quad C \rightarrow cC | d$ L5 8M

UNIT-IV

- 7 a) List out various forms of Intermediated code L1 4M
b) Generate the three-address code for the following 'C' Program fragment L6 8M
for (i=1;i<=20;i++) if(a<b) x=y+z;

OR

- 8 a) Compare three different Storage allocation strategies L5 6M
b) Discuss about the Heap allocation strategy of runtime environment with an example L2 6M

UNIT-V

- 9 a) Explain how given program can be converted into flow graph L2 6M
b) Explain about machine independent code optimization techniques L2 6M

OR

- 10 a) Discuss the design issues of Code Generator L2 6M
b) Explain the Code generation algorithm to generate code for the following expression $x=(a-b) + (a+c)$ L2 6M

SIDDARATHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular Examinations March 2023
TRANSPORTATION ENGINEERING
(CIVIL)

Time: 3 Hours

Max. Marks: 60

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

- 1 Enumerate the factors governing the width of carriage way. State the IRC Specification for width of carriage way for various classes of roads. L1 12M
UNIT-I
- 2 A valley curve is formed by a descending gradient of 1 in 40 meeting with an ascending gradient of 1 in 30. Design the length of valley curve for a design speed of 120 kmph so as to fulfill both comfort conditions and head light sight distance requirements. Assume rate of change of change of centrifugal acceleration as 0.6 m/sec^3 , reaction time 1.5 sec and coefficient of friction 0.30 L3 12M
OR
- 3 Explain the various road user characteristics to be considered in road design. L1 12M
UNIT-II
- 4 a) Explain about the various types of on-street parking patterns possible. L1 4M
b) What are the objectives of Traffic Volume studies? What are the methods of presentation of Volume Data? L1 8M
UNIT-III
- 5 Design a new flexible pavement for a two-lane undivided carriageway using the following data: Design CBR value of subgrade = 8.0%, Initial traffic on completion of construction = 1800 CV per day, Average growth rate = 6.0% per year, Design life = 15 years, VDF value = 2.5. L3 12M
OR
- 6 A cement concrete pavement has a thickness of 25 cm and lane width of 2.5 m. Design the tie bars Along the longitudinal joints using the data given below: L3 12M
Allowable working stress in steel tie bars, $S_s = 1050 \text{ kg/cm}^2$
Unit weight of CC, $W = 2400 \text{ kg/cm}^3$
Maximum value of friction coefficient, $f = 1.2$
Allowable tensile stress in deformed tie bar, $S_s = 2000 \text{ kg/cm}^2$
Allowable bond stress in deformed bars, $S_b = 24.6 \text{ kg/cm}^2$
UNIT-IV
- 7 Explain the role of chairs, keys and fish plates as track fitting and fastenings. Support your Answer with neat sketch. L1 12M
OR
- 8 a) What are the functions of sleepers? Bring out the differences between suspended and supported rail joints L2 6M
b) Define creep in the rails. Explain various causes of creep. L2 6M

UNIT-V

- 9 a) Define grade compensation? If the ruling gradient is 1 in 120 on a particular section of MG and at the same time a 2.6 degree curve is situated on this ruling gradient, find out the allowable ruling gradient. L2 6M
b) Calculate the maximum permissible speed on a curve of high speed for the following data on a M.G track. Degree of curve 0.8° , amount of super elevation 6.0cm, length of transition curve 125 m, maximum speed of the section likely sanctioned speed = 100 kmph. L3 6M
OR
- 10 a) If a ruling gradient of 1 in 250 is fixed on a B.G section and a horizontal curve of 4° is also to be introduced over it. What should be the actual ruling gradient? L3 6M
b) Draw a neat sketch of Left hand turnout and show various parts of turnout. L2 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular Examinations March 2023

ELECTRICAL MACHINES -III

(EEE)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

- 1 a) Explain the principle of operation of a synchronous generator. L2 6M
b) Compare between DC Generator and AC Generator L3 6M

OR

- 2 A 3-phase, 50 Hz, 16 pole star connected alternator has stator winding with 144 slots with 10 conductors per slot. The flux per pole is 0.04 wb and is distributed sinusoidally. The speed is 375 rpm. Find the frequency, phase EMF, and line EMF. The coil span is 120 degree electrical. L2 12M

UNIT-II

- 3 a) State and explain the voltage equation of an alternator L2 6M
b) Define the voltage regulation of an alternator. Explain the various factors, which may affect the regulation of an alternator L4 6M

OR

- 4 Explain the procedure for the construction of the Potier triangle by ZPF method and How do you calculate the no-load voltage and voltage regulation with a phasor diagram? L2 12M

UNIT-III

- 5 a) What is infinite bus bar? Explain synchronization of alternator with infinite bus bar L1 6M
b) Explain necessity of parallel operation of alternators L2 6M

OR

- 6 A 5000 KVA, 10 kV, 1500 RPM, 50Hz, alternator runs in parallel with other machines. Its synchronous reactance is 20%. Find for a) no load, b) full load at power factor 0.8 lagging, and synchronous power per unit mechanical angle of phase displacement and calculate the synchronous torque, if the mechanical displacement is 0.5°. L3 12M

UNIT-IV

- 7 a) Explain the construction and working principle of a synchronous motor. L2 6M
b) Why synchronous motor is not self-starting. Explain in detail. L4 6M

OR

- 8 Explain the operation of a synchronous motor at constant load Variable excitation with neat phasor diagrams. L2 12M

UNIT-V

- 9 a) Define various torques associated with synchronous motors. L1 6M
b) Explain the procedure for starting a synchronous motor. L2 6M

OR

- 10 A 3-phase, 3300V, star-connected synchronous motor has an effective resistance and synchronous reactance of 2 Ω and 18 Ω per phase respectively. If the open circuit generated e.m.f is 3800 V between lines, calculate i) The maximum total mechanical power that the motor can develop and ii) The current and power factor at the maximum mechanical power. L3 12M

HEAT AND MASS TRANSFER

(MECH)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

- 1 Derive general differential equation of heat conduction L3 12M
- OR
- 2 a) A stainless steel plate 2cm thick is maintained at a temperature of 550°C at one face 50°C on the other. The thermal conductivity of stainless steel at 300°C is 19.1 W/mK. Compute the heat transferred through the material per unit Area. L3 8M
- b) Describe the conduction and thermal conductivity L2 4M

UNIT-II

- 3 A wall of 0.5 m thickness is to be constructed from a material which has an average thermal conductivity of 1.4 W/mK. The wall is to be insulated with a material having an average thermal conductivity of 0.35 W/mK so that the heat loss per square meter will not exceed 1450 W. Assuming that the inner and outer surface temperature are 1200°C and 15°C respectively, calculate the thickness of insulation required. L3 12M
- OR
- 4 a) List and describe the equations for heat conduction through plane walls with and without heat generation. L2 4M
- b) Calculate the rate of heat loss for a red brick wall of length 5m, height 4 m, and thickness 0.25 m. The temperature of the inner surface is 40°C. The thermal conductivity of red brick, $k=0.70$ W/mK. Calculate also the temperature at an interior point of the wall, 20 cm diameter from the inner wall. L3 8M

UNIT-III

- 5 a) Describe the velocity boundary layer theory on a flat plate. L2 6M
- b) Distinguish between natural and forced convection heat transfer L2 6M
- OR
- 6 Water flows through a tube of 2 cm ID at a rate of 1.5 litres per minute. Taking the kinetic viscosity of water as 1×10^{-6} m²/s, determine whether the flow is laminar or turbulent. Also estimate the entry length. L3 12M

UNIT-IV

- 7 Draw and explain various regimes in pool boiling concept. L2 12M
- OR
- 8 a) Explain Absorptivity, Reflectivity and Transmissivity of Grey body and black body. L2 6M
- b) What is Stefan-Boltzmann Law? Explain the concept of total emissive power of a surface. L3 6M

UNIT-V

- 9 In a double pipe counter flow heat exchanger, 10000 kg/h of an oil having a specific heat of 2095 J/kg K is cooled from 80°C to 50°C by 8000 kg/h of water entering at 25°C. Determine the heat exchanger area for an overall heat transfer coefficient of 300 W/m² K. Take C_p for water as 4180 J/kg K. L3 12M
- OR
- 10 a) Define heat exchanger and list the applications of heat exchanger L3 4M
- b) List various types of heat exchangers. Draw and explain two pass shell and tube heat exchanger. L3 8M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular Examinations March 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 Draw a block diagram of Microprocessor controlled temperature system and identify function of each component. L4 12M

OR

- 2 a) How are computers classified? Explain in brief. L1 6M
b) Explain how memory addresses are assigned to a memory chip of size 1K (1024X8)? L2 6M

UNIT-II

- 3 a) Sketch neat the block diagram of 8085 Architecture and explain the function of each block. L3 8M
b) Discuss the different types of registers used in the 8085 microprocessors. L2 4M

OR

- 4 a) Draw the flag register of the 8085 microprocessor and explain each bit in detail. L2 6M
b) List out the instruction sets, Explain the instruction sets with examples. L2 6M

UNIT-III

- 5 a) Draw the internal architecture of 8051 microcontroller and explain the function of each block present in it. L2 8M
b) Describe the functions of PCON and SCON in the 8051 microcontroller. L2 4M

OR

- 6 a) Compare serial communication and parallel communication. L4 6M
b) Explain how the 8051 microcontroller transfers the serial data input and output using UART. L2 6M

UNIT-IV

- 7 a) Discuss the following instructions of 8051 microcontroller with an example. (i) Bit-level logical operations (ii) Byte level logical operations L2 8M
b) Explain how the 8051 microcontroller performs rotate and swap operations with an example. L2 4M

OR

- 8 a) Explain the function of stack and data exchanges instruction with an example. L2 6M
b) Discuss the code memory read only data moves L3 6M

UNIT-V

- 9 a) Define the D/A and A/D conversions and write any five advantages L1 6M
b) Draw diagram and explain the D/A converter circuit. L4 6M

OR

- 10 a) Illustrate the programs for keyboards. L3 6M
b) Explain and draw the scanning keyboard's and its configuration. L2 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular Examinations March 2023

DATA WAREHOUSING AND DATA MINING

(CSE)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

1 Explain in detail about Data Mining Functionalities with example L2 12M

OR

2 a) Determine the concept hierarchy generation for categorical data. L3 6M

b) Discuss the Major issues in Data mining. L2 6M

UNIT-II

3 Discuss the following data warehouse Model. L2 12M

i) Enterprise Warehouse

ii) Data Mart

iii) Virtual Warehouse

OR

4 a) Distinguish between OLTP and OLAP. L2 6M

b) Explain the Role of Concept Hierarchies in dimension L2 6M

UNIT-III

5 a) Discuss about Basic Concepts of Frequent Item set mining. L2 6M

b) Explain about Constraint based Association mining L2 6M

OR

6 Make use of the following database which has five transactions. Let L3 12M
minimum Support = 60% and minimum confidence = 80%

Transaction	Items
T10	M, O, N, K, E, Y
T20	D, O, N, K, E, Y
T30	M, A, K, E
T40	M, U, C, K, Y
T50	C, O, O, K, I, E

Find all frequent item sets using FP-growth.

UNIT-IV

7 Illustrate about Naïve Bayes Classification with an example. L2 12M

OR

8 a) Evaluate the Classification process of back propagation model with an L5 6M
example.

b) Discuss a. out Rule based Classification method. L2 6M

UNIT-V

9 Illustrate the importance of Grid-based and Model-Based methods in L1 12M
detail.

OR

10 a) Discuss the key issues in hierarchical clustering algorithm. L2 6M

b) What are the various requirements involve Cluster Analysis. L1 6M

UNIT-I

- 1 Prepare a preliminary estimate of a residential building project with a total plinth area of all buildings of 1950 sq.m. for following given data L2 12M

Plinth area rate	Rs. 12,500/- per sq. m.
Extra for special Architectural treatment	1.5% of the building cost
Extra for Water supply and Sanitary installations	5% of the building cost
Extra for internal installations	12% of the building cost
Extra for services	7% of the building cost
Contingencies	3% of the building cost
Supervision charges	5% of the building cost

OR

- 2 Calculate the quantities of the following items for the building shown in fig.2 using Longwall and short wall method. L3 12M

- Earth work in excavation
- PCC (1: 5: 10) below the foundation
- Brick work in foundation and plinth
- Damp Proof Course
- Brick masonry in CM (1:6) for super structure.

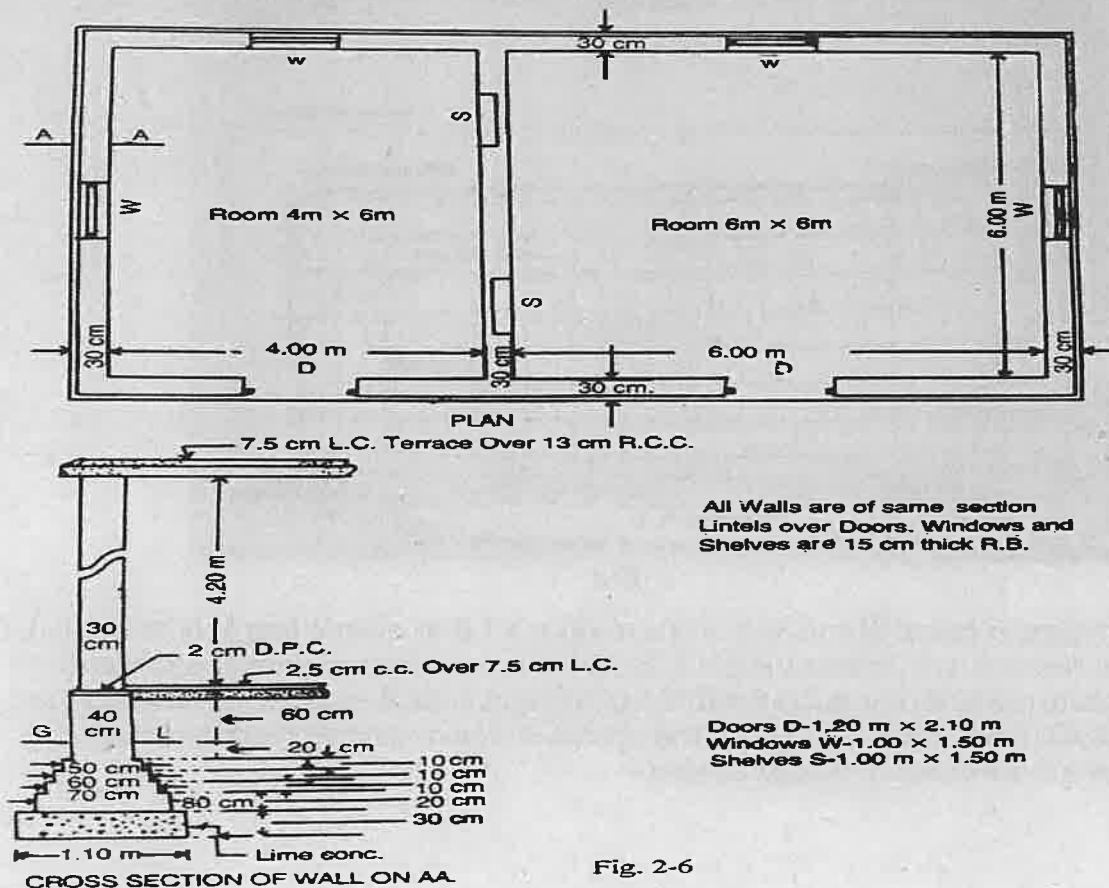
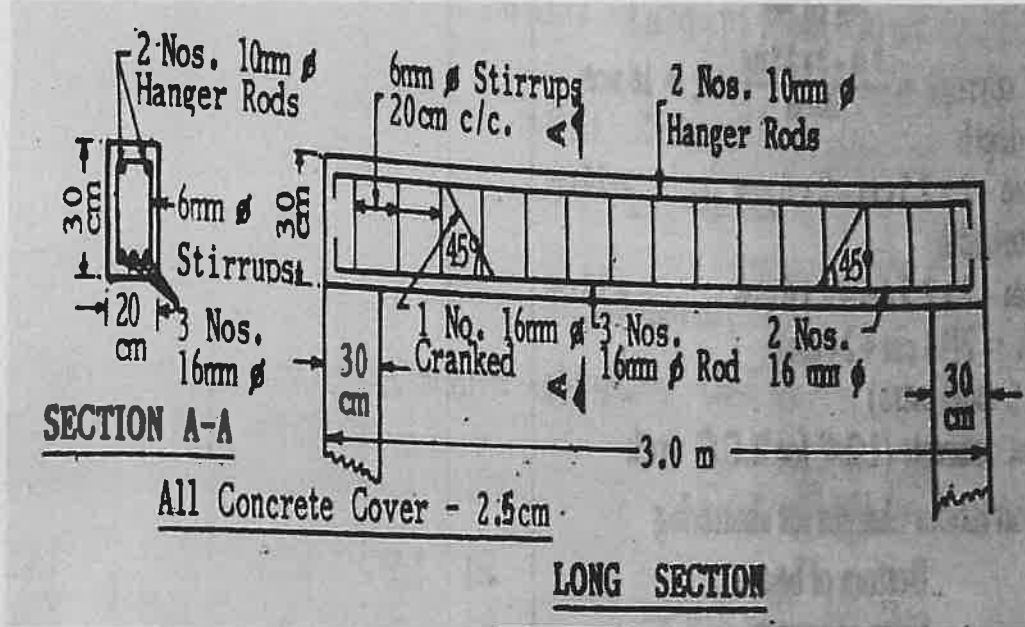


Fig. 2-6



UNIT-IV

7 Evaluate the rate analysis for earth work excavation for building foundations with lead of 10 m and lift of 2 m. in all types of soils and also Plain Cement Concrete (PCC) (1:5:10) L2 12

OR

8 Work out the rate analysis for white washing with two coats for outside walls and synthetic enamel painting to wooden works with two coats over a primer coat. L2 12

UNIT-V

9 Give detailed account on specifications of RCC (1:2:4). L2 12

OR

10 In a plot of land costing Rs.20,000.00 a building has been newly constructed at the total cost of Rs.80,000.00 including sanitary and water supply works, electrical installation, etc. The building consists of four flats for four tenants. The owner expects 8% return on the cost of construction and 5% return on the cost of land. Calculate the standard rent for each flat of the building assuming: - L3 12

(i) The life of the building as 60 years and sinking fund will be created on 4% interest basis.

(ii) Annual repairs cost at 1% of the cost of construction

(iii) Other outgoings including taxes at 30% of the net return on the building.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular Examinations March 2023

ELECTRICAL MEASUREMENTS AND INSTRUMENTATION

(EEE)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

1 What are the different types of damping systems? Explain them with neat diagram. L3 12M

OR

2 a) Describe the construction and working of attraction type MI Instrument L3 6M
b) List the advantages & disadvantages of MI type instruments. L2 6M

UNIT-II

3 Explain the construction and working of Anderson Bridge with suitable diagrams. L3 12M

OR

4 a) Justify how the inductance is measured in terms of known capacitance using Maxwell's bridge. L2 6M
b) List the advantages and disadvantages of Maxwell's bridge. L2 6M

UNIT-III

5 a) Explain the Constructional details of electro dynamometer type wattmeter with a neat sketch. L5 6M

b) Explain the advantages and disadvantages of single phase Induction type Energy meter. L5 6M

OR

6 a) Derive the torque equation for single phase induction type energy meter. L5 6M

b) Explain driving system, moving system and braking system in a single phase induction type energy meter. L2 6M

UNIT-IV

7 Describe the working principle of piezo electric transducers. L1 12M

OR

8 a) Describe the construction and working of LVDT with a neat schematic diagram. L2 6M

b) Describe the working principle of thermocouples. L3 6M

UNIT-V

9 Explain the internal structure of CRT with a neat diagram. L3 12M

OR

10 a) Describe the construction and working of Flux meter. L3 6M

b) Compare flux meter and Ballistic Galvanometer. L3 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular Examinations March 2023

METAL CUTTING AND MACHINE TOOLS

(ME)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

- 1 Explain the functions and significance of different tool angles associated with the geometry of a single point cutting tool with neat sketch. L2 12M

OR

- 2 a) Explain the basic elements of metal cutting with a neat sketch. L1 6M
b) Define the elements of a single point cutting tool. L1 6M

UNIT-II

- 3 Draw the Merchant's circle diagram and derive the relationships among different forces acting on the cutting tool and coefficient of friction. L2 12M

OR

- 4 a) Discuss the stress and strain acting on a chip. L3 6M
b) In an orthogonal turning operation, cutting speed is 8 m/min, cutting force 25kg, feed force 9kg, rake angle 10°, feed 0.3mm/rev and chip thickness 0.3mm. Determine the shear angle and chip thickness ratio. L3 6M

UNIT-III

- 5 a) Define the working principle of lathe. How is the lathe specified? L1 6M
b) Name at least five work holding devices used in lathe. L2 6M

OR

- 6 a) List the common tools and attachments used on Turret and Capstan lathes. L1 6M
b) List the Turret lathe operations and explain any one operation with a neat sketch. L1 6M

UNIT-IV

- 7 Explain with neat sketches any one of the following i) Radial drilling machine ii) drilling machine iii) Gang drilling machine. L2 12M

OR

- 8 a) What is a shaper? Explain the working principle and specification of a shaper L1 6M
b) How are the shapers classified? State the advantages, limitations and applications of shaper L1 6M

UNIT-V

- 9 With a neat sketch, explain the construction and working of tool and cutter grinding machine. L2 12M

OR

- 10 a) How are Broaching machines classified? L2 6M
b) What are the advantages, limitations and applications of broaching machines? L1 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular Examinations March 2023

DIGITAL SIGNAL PROCESSING

(ECE)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

- 1 Compute DFT of the sequence $x(n) = \{1,1,1,1,1,1,1,0\}$ using Radix-2 DIT FFT algorithm. L3 12M

OR

- 2 a) How FFT improves the speed of computation? Find the number of multiplication and additions required in an 8-point radix-2 FFT. L3 4M
b) Evaluate the output $y(n)$ of a filter whose impulse response is $h(n) = \{1,1,1\}$ and input signal $x(n) = \{3, -1, 0, 1, 3, 2, 0, 1, 2, 1\}$ using overlap save method. L2 8M

UNIT-II

- 3 Design a digital Butterworth IIR filter satisfying the following constraints. Let $T=1s$, apply Impulse Invariant Transformation. L3 12M

$$0.8 \leq |H(w)| \leq 1; 0 \leq w \leq 0.2\pi$$

$$|H(w)| \leq 0.2; 0.32\pi \leq w \leq \pi$$

OR

- 4 a) Explain the frequency transformation technique in analog domain for converting low pass to low pass filter and low pass to high pass filter with frequency response. L2 6M
b) Construct the Direct form I and Direct form II, of the LTI System described by the equation $y(n) = -(3/8)y(n-1) + (3/32)y(n-2) + (1/64)y(n-3) + x(n) + 3x(n-1)$ L2 6M

UNIT-III

- 5 a) Design an FIR digital filter to approximate an ideal Low pass filter with pass band gain of unity, cutoff frequency of $1kHz$, and working at a sampling frequency $f_s = 4kHz$. The length of the impulse response should be 11. Use Fourier series method. L5 6M
b) Give the equations for Rectangular, Hanning and Hamming window and explain its significance. L5 6M

OR

- 6 a) Explain the Procedure for designing FIR filters using windows. L5 6M
b) Construct the Direct form realization of system function. L2 6M

$$H(Z) = 1 + 2Z^{-1} - 3Z^{-2} - 4Z^{-3} + 5Z^{-4}$$

UNIT-IV

- 7 Consider the transfer function $H(z) = H_1(Z).H_2(Z)$ where $H_1(Z) = 1/(1-a_1Z^{-1})$ and $H_2(Z) = 1/(1-a_2Z^{-1})$. Find the output round off noise power. Assume $a_1 = 0.5$ and $a_2 = 0.6$. L1 12M

OR

- 8 a) What is meant by zero limit cycle oscillation? Explain with example. L2 6M
b) Discuss briefly about different types of number representation with examples. L3 6M

UNIT-V

- 9 Draw the architecture of TMS320C50 and explain its important blocks. L3 12M

OR

- 10 a) Explain the two categories of DSP's in detail. L3 6M
b) Draw and explain Arithmetic and logic unit (ALU) of TMS320C54x. L3 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular Examinations March 2023

SOFTWARE ENGINEERING

(CSE)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

1 Discuss briefly about different types of Software Myths? L2 12M

OR

2 a) Define the term Software Engineering – A Layered Technology L1 6M

b) What is SDLC? How it is used in Software Development Process? L2 6M

UNIT-II

3 Define Requirement Engineering. Examine the steps involved in RE Process L4 12M

OR

4 a) Differentiate Behavioral Model Vs Structural Model L4 6M

b) What are all the UML Models that supplement the Use-case diagram? Explain L2 6M

UNIT-III

5 a) Explain common characteristics in the evolution of software design L2 6M

b) Identify Design patterns. What is the intent of each design pattern? L3 6M

OR

6 a) Why Cohesion and Coupling is used in Software Design Process. What are the types in it. Differentiate all the types? L4 6M

b) Distinguish between Analysis Model and Design Model L5 6M

UNIT-IV

7 Briefly explain about golden rules in the user interface design L2 12M

OR

8 a) Explain Interface Design workflow for WebApps L2 6M

b) Define five quality attributes of WebApp Design L1 6M

UNIT-V

9 Explain about the importance of test strategies in conventional software L2 12M

OR

10 a) Explain the Differences between Alpha and Beta testing L4 6M

b) Identify the Object-Oriented Testing Methods and Explain L3 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular Examinations March 2023
FOUNDATION ENGINEERING
(CIVIL)

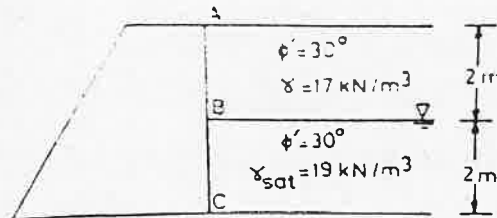
Time: 3 Hours

Max. Marks: 60

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

UNIT-I

- 1 Determine the lateral earth pressure at rest per unit length of wall as shown in fig. Also determine the resultant earth pressure. Take $K_0=1-\sin\phi'$, $\gamma_w=10\text{kN/m}^3$.



L3 12M

OR

- 2 a) Discuss Culmann's method for the determination of active earth pressure. L3 6M
b) Explain the gravity retaining walls with the help of neat sketch. L2 6M

UNIT-II

- 3 A strip footing of 2m width is founded at a depth of 4m below the ground surface. Determine the net ultimate bearing capacity, using a) Terzaghi's equation ($N_c=5.7$, $N_\gamma=1.0$, $N_q=0.0$), b) Skempton's equation c) IS Code ($N_c=5.14$). The soil is clay ($\phi=0^\circ$, $C=10\text{kN/m}^2$). The unit weight of soil is 20kN/m^3 . L3 12M

OR

- 4 a) Determine the ultimate bearing capacity of a square footing, resting on the surface of saturated clay of unconfined compressive strength of 98kN/m^2 . L2 6M
b) A rectangular footing (3 m X 2 m) exerts a pressure of 100kN/m^2 on a cohesive soil ($E_s = 5 \times 10^4$ and $\mu=0.50$). Determine the immediate settlement at the centre, assuming a) Footing is flexible b) Footing is rigid. L2 6M

UNIT-III

- 5 a) List the various classifications of pile foundations and explain any two methods for installation of piles. L2 6M
b) How would you estimate the load carrying capacity of a pile by using dynamic formulae? L2 6M

OR

- 6 a) Describe how the pile load test is conducted with a neat sketch. L2 6M
b) How would you estimate the group action of piles in (a) sand (b) clay? L2 6M

UNIT-IV

- 7 Discuss various forces acting on well foundation. L1 12M

OR

- 8 a) What are the advantages and disadvantages of Floating caisson and discuss stability of floating caisson during flotation? L2 6M
b) Describe the various components of pneumatic caisson with the help of neat sketch. L3 6M

UNIT-V

- 9 Explain in detail Rowe's moment reduction curves. L2 12M

OR

- 10 a) Explain in detail the pressure distribution of cantilever sheet pile in cohesion less soils with neat sketch. L3 6M
b) Explain the stability of anchored sheet piles with free earth support with neat sketch. L3 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular Examinations March 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 power quality standards and explain the power quality terminology L1 12M

OR

- 2 a) Draw and explain the CBEMA & ITI curve L2 6M
b) Define notching, coupling, surge and flicker L1 6M

UNIT-II

3 What is the main cause for impulsive transient? What are the principles of over voltage protection explain with diagrams L1 12M

OR

- 4 a) Explain the effect of line drop compensation on the voltage profile L2 6M
b) Explain the long and short duration voltage variations. L2 6M

UNIT-III

- 5 a) What are the harmonics sources from industrial and commercial loads? L2 6M
b) Explain the various devices for the controlling of harmonics distortion. L1 6M

OR

- 6 a) Explain the principles of controlling harmonics. L5 6M
b) Write the impact of voltage distortion and current distortion. L2 6M

UNIT-IV

7 Explain the categories of instruments to consider for harmonic analysis. L1 12M

OR

- 8 a) Explain the various power quality monitoring considerations & various power quality measuring equipment L2 6M
b) Explain about smart power quality monitors. L3 6M

UNIT-V

9 What is Solid State Breaker? Explain the Solid State Breaker principle of operation? L3 12M

OR

- 10 a) What are the advantages of static var compensators? Discuss the operation of Static Series Compensators? L3 6M
b) What is the need for current limiter? Discuss the operation of a Solid state current limiter L3 6M

Q.P. Code: 20ME0329

R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular Examinations March 2023

INDUSTRIAL ENGINEERING AND MANAGEMENT

(ME)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

- 1 a) Elucidate the principles of organization. L3 6M
b) "Accountability is important for an Organization". Comment. L2 6M

OR

- 2 a) Summarize the important characteristics of management L3 6M
b) Name and describe various levels of management with their function L2 6M

UNIT-II

- 3 List out the merits and demerits of urban and suburban locations for a plant. L3 12M

OR

- 4 What are the various data analyzing forms in plant layout? Elucidate them in detail with neat sketch L2 12M

UNIT-III

- 5 Explain the steps involved in method study procedure L5 12M

OR

- 6 a) Elucidate various method study symbols in detail. L5 6M
b) Compare outline process chart and flow process chart L2 6M

UNIT-IV

- 7 Summarize the features of perfect and imperfect competition L2 12M

OR

- 8 a) Describe briefly the Delphi opinion survey method of forecasting. L2 6M
b) Define Law of Demand and demand forecasting. L3 6M

UNIT-V

- 9 Describe the scope, merits and demerits of Supply Chain management? L3 12M

OR

- 10 How to Plan & Develop the Right Supply Chain Strategy? L1 12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular Examinations March 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) Define (i) Accuracy (ii) Precision (iii) Sensitivity L1 6M
 b) The expected value of the voltage across a resistor is 100 V. However, the measurement gives a value of 89 V. Calculate L3 6M
 (i) Absolute error (ii) % Error (iii) Relative accuracy and (iv) % of Accuracy.

OR

- 2 a) Define Calibration L1 2M
 b) Illustrate in detail about the statistical analysis of measurement data. L2 10M

UNIT-II

- 3 With the neat sketch, explain the working principle of Dual beam oscilloscope. L2 12M

OR

- 4 Derive the Deflection of Sensitivity. L3 12M

UNIT-III

- 5 a) With a neat sketch, explain the operation of arbitrary waveform generator. L2 8M
 b) What are the different specifications of arbitrary waveform generator? L1 4M

OR

- 6 a) Define Wave Analyzer and Explain it's working principle. L1 6M
 b) Describe the operation of Frequency selective type wave Analyzer using a neat diagram. L2 6M

UNIT-IV

- 7 Derive the Expression of Anderson's Bridge. L3 12M

OR

- 8 a) Draw and Explain about the Q-meter. L2 8M
 b) Define Q-Meter and Write the Applications of Q-Meter. L3 4M

UNIT-V

- 9 Draw and Explain about the Operation of RTD. L3 12M

OR

- 10 a) Draw and Explain about the Operation of Capacitive Transducer. L2 8M
 b) Define a transducer. What are the different types of Transducers? L1 4M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular Examinations March 2023

CYBER SECURITY

(CSE)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

1 Briefly Explain benefits and examples of Information Security Management system generally adopted in organization? L2 12M

OR

2 a) What is information security and objective of Information security? L1 6M

b) List out the types of criminals and various cyber crimes L2 6M

UNIT-II

3 How Cyber Criminals plan the attacks explain in details. L2 12M

OR

4 What is Cloud Computing? Types Cloud computing and list the advantages of Cloud computing? L2 12M

UNIT-III

5 a) Explain about the organizational measures for handling the mobile devices L2 6M

b) How to Secure/safeguard your Cell/Mobile Phone from being Stolen/Los L2 6M

OR

6 a) Explain Computer Malwares, viruses and worms L2 6M

b) What is Authentication? Describe steps used in authentication service security? L2 6M

UNIT-IV

7 What is Password Cracking. Explain the tools used in password cracking L1 12M

OR

8 a) Describe the Spywares in details and explain how it harms our computer systems L2 6M

b) What is Trojan horse? Explain how it attack with example in cyber security. L3 6M

UNIT-V

9 Discuss the various organizational implications with example. L3 12M

OR

10 a) Explain bout types of cookies in detail L2 6M

b) What are the security risks in cyber security explain in details L2 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular Examinations March 2023

INTRODUCTION TO COMMUNICATION SYSTEMS

(CE, EEE, MECH, ECE & CSE)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

- 1 i. Define modulation. Classify different types of modulation. L3 12M
ii. Determine the modulation index of AM, Percentage Modulation and Bandwidth of AM.

OR

- 2 a) Explain single tone modulation for transmitting only upper side band (USB) frequency of SSB modulation L3 6M
b) Explain briefly about the various applications of SSB-SC. L2 6M

UNIT-II

- 3 Derive the expression of Frequency modulation. Compare NBFM and WBFM? L3 12M

OR

- 4 a) Explain the generation of FM using direct method. L2 6M
b) Explain the block diagram of indirect method in FM generation. L2 6M

UNIT-III

- 5 a) What are the advantages and disadvantages of PWM signal? L5 6M
b) Differentiate between the Pulse Amplitude Modulation and Pulse Width Modulation with its modulated waveforms. L5 6M

OR

- 6 a) Calculate the input signal to noise ratio for an amplifier with an output signal to noise ratio of 16 dB and a noise figure of 5.4 dB L5 6M
b) Explain Pulse Amplitude modulation with its waveforms. L2 6M

UNIT-IV

- 7 Illustrate with a neat block diagram explain PCM transmitter and receiver. L1 12M

OR

- 8 a) Compare PCM, DPCM, and DM. L2 6M
b) Draw the block diagram of BFSK modulator and explain the operation L3 6M

UNIT-V

- 9 A spectrum of 20 MHz of bandwidth is allocated to a particular FDD cellular telephone system which uses two 15 kHz simplex channels to provide full duplex voice and control channels, compute the number of channels available per cell if a system uses (i) four-cell reuse, (ii) seven-cell reuse, and (iii) 12-cell reuse. If 0.5 MHz of the allocated spectrum is dedicated to control channels, determine an equitable distribution of control channels and voice channels in each cell for each of the three systems. L3 12M

OR

- 10 a) Explain third generation (3G) wireless networks. L3 6M
b) Explain the multiple access schemes for narrowband systems. L3 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular Examinations March 2023

GENERATION OF ENERGY FROM WASTE

(CE, EEE, MECH, ECE & CSE)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

1 What is industrial waste? What are the effects of industrial waste? What are the management of industrial waste? L2 12M

OR

2 a) Define incinerator. L1 3M
b) Explain the following incinerators briefly. L2 9M
(i) Moving Grate (ii) Fluidized bed (iii) Rotary Kiln

UNIT-II

3 Write down the short notes on charcoal. L3 12M

OR

4 a) Define pyrolytic oil? L1 3M
b) Explain the manufacturing process of pyrolytic oils briefly L2 9M

UNIT-III

5 Explain Gasifier burner arrangement for thermal heating in detail L3 12M

OR

6 a) What are the overall Steps Involved in Biomass Gasification? L5 6M
b) What are the factors Affecting the Gasification Process? L2 6M

UNIT-IV

7 Explain Design, Construction and Operation of Inclined Grate Combustor. L2 12M

OR

8 a) What is Biomass Combustion? L2 2M
b) What is the Biomass Combustion Mechanism? L3 10M

UNIT-V

9 Discuss Biomass conversion processes L3 12M

OR

10 a) Write short notes on Urban Waste to Energy Conversion L2 6M
b) Write short notes on Biomass Energy Programme L2 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B. Tech III Year I Semester Regular Examinations March 2023

MANAGEMENT SCIENCE
(CE, EEE, MECH, ECE & CSE)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

1 Define Management? Explain its nature and functions of Management. L1 12M

OR

2 a) Comment on Elton Mayo's Human relations of Management. L2 6M

b) Distinguish between Centralization and Decentralization. L4 6M

UNIT-II

3 Explain the Principles and Types of Plant Layout. L2 12M

OR

4 a) Restate the concept of Marketing Mix. L2 6M

b) Develop the Marketing Strategies based on Product Life Cycle. L5 6M

UNIT-III

5 a) Discuss the Nature and functions of HRM L2 6M

b) How would you ensure that the training is effective for an employee within the company? L1 6M

OR

6 a) Define Employee Recruitment and also sources of recruitment. L1 6M

b) Outline the main purpose of employee induction. L4 6M

UNIT-IV

7 Build effective Steps for Strategy Formulation and Implementation. L6 12M

OR

8 a) Explain the most challenging part of SWOT analysis. L2 6M

b) Describe some major problems associated with environmental scanning? L2 6M

UNIT-V

9 Recall the key feature and process of materials requirements planning. L1 12M

OR

10 a) Name the biggest challenge faced when implementing Six Sigma projects. L1 6M

b) Explain the process of knowledge management. L2 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular Examinations March 2023

NON- CONVENTIONAL ENERGY RESOURCES

(CE, EEE, MECH, ECE & CSE)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

- 1 Make a note on need for non-conventional energy sources, and alternate energy sources? L3 12M

OR

- 2 a) Explain the principle of conversion of solar energy in to heat. L3 6M
b) Mention the working principles of Pyranometer, Pyrheliometer? L2 6M

UNIT-II

- 3 Explain the following terms: i) Altitude Angle ii) Incident Angle iii) Zenith Angle iv) Solar Azimuth Angle v) Hour Angle L3 12M

OR

- 4 a) Mention various applications of solar energy in various sectors? L2 6M
b) Distinguish between Flat Plate and Concentrating Collectors L2 6M

UNIT-III

- 5 a) Explain with a neat sketch the working of a wind energy systems(WECS) with main components L5 6M
b) What are the advantages of vertical axis machines over horizontal type? Describe a rotor for relatively low velocity speed L5 6M

OR

- 6 a) Explain Maximum Power point tracking procedure for a Wind System L5 6M
b) Explain the importance of converters in PV System L2 6M

UNIT-IV

- 7 What is meant by wet fermentation and dry fermentation? Enlist the factors which affect the size of the Bio Gas Plants? L1 12M

OR

- 8 Define a Geothermal Source. Explain the principle of total flow concept. Compare it with other system L2 12 M

UNIT-V

- 9 Discuss briefly about Hydrogen storage and transportation and safety aspects? L3 12M

OR

- 10 Write Short notes on the Following: L3 12M
a) Materials used or Biogas generation
b) Fuel cells
c) Solar radiation data