SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. I Year I Semester Supplementary Examinations June/July-2025
ENGINEERING PHYSICS
(Common to CE & AGE)

Time: 3 Hours   **Max. Marks: 60**

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

UNIT-I

1	a	Describe the formation of Newton's ring with necessary theory with relevant diagram and derive the expressions for dark and bright fringes.	CO1	L1	9M
	b	In a Newton's rings experiment, the diameter of the 5th ring is 0.30 cm and the diameter of the 15th ring is 0.62 cm. Calculate the diameter of the 25th ring.	CO1	L2	3M

OR

2	a	Define diffraction grating and explain about construction of diffraction grating.	CO2	L2	8M
	b	Define following terms i. Grating spectrum ii. Grating element.	CO2	L2	4M

UNIT-II

3	a	Show that FCC is mostly closed packed structure than BCC and SC.	CO2	L4	8M
	b	Find the ratio $d_{100}:d_{110}:d_{111}$ for a simple cubic structure.	CO2	L5	4M

OR

4	a	Illuatrate the principle, procedure and advantage of Debye-Scherrer (Powder method) of X-ray diffraction.	CO2	L3	8M
	b	Define coordination number and atomic packing factor.	CO2	L2	4M

UNIT-III

5	a	Define following terms (i) Reverberation (ii) Absorption coefficient (iii) Pitch and Loudness of sound.	CO3	L2	6M
	b	Derive Sabine's formula for reverberation time? Mention factors controlling the reverberation time.	CO3	L4	6M

OR

6	a	Explain thee properties of Ultrasonic waves.	CO4	L2	6M
	b	Illustrate the medical applications of ultrasonic waves.	CO4	L3	6M

UNIT-IV

7	a	Derive the relation between different elastic moduli.	CO4	L4	8M
	b	What is Hooke's law? Explain.	CO4	L2	4M

OR

8	a	Illustrate different types of supports.	CO4	L3	6M
	b	Define i) Rigidity Modulus ii) Poisson's ratio.	CO4	L2	6M

UNIT-V

9	a	Differentiate DC and AC Josephson effects in superconductors.	CO5	L4	6M
	b	Explain the properties of Superconductors.	CO5	L2	6M

OR

10	a	Discuss the mechanical, magnetic and optical properties of nanomaterials.	CO5	L2	6M
	b	Explain ball milling technique for the synthesis of nanomaterial.	CO5	L2	6M

*** END ***

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. I Year I Semester Supplementary Examinations June/July-2025
APPLIED PHYSICS
(Common to CSE, CSIT, CSM, CIC, CAD, CCC & CSI)

Time: 3 Hours   **Max. Marks: 60**

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

UNIT-I

1	a	Discuss the theory of interference of light due to thin films by reflection with a suitable ray diagram.	CO1	L1	6M
	b	Derive the condition for bright and dark fringe interference in the case of thin films by reflected light.	CO1	L4	6M

OR

2	a	In the study of Fraunhofer diffraction due to single slit how the diffraction fringes formed.	CO1	L2	4M
	b	Obtain conditions for principal maxima, minima and secondary maxima in single slit diffraction pattern and draw its intensity distribution curves.	CO1	L2	8M

UNIT-II

3	a	Define the following terms: i) Drift Velocity (ii) Mean free path.	CO2	L1	4M
	b	Derive an expression for electrical conductivity in a metal by quantum free electron theory.	CO2	L4	8M

OR

4	a	Explain the formation of energy bands in solids.	CO2	L2	4M
	b	Classify the solids into conductor, semiconductor & insulators based on band theory of solids.	CO2	L2	8M

UNIT-III

5	a	Explain population inversion.	CO3	L2	4M
	b	Describe the construction and working principle of He-Ne Laser with the help of a neat diagram.	CO3	L2	8M

OR

6	a	What is the numerical aperture of an optical fibre and derive an expression for it.	CO3	L1	8M
	b	Calculate the numerical aperture and acceptance angle of an optical fibre of core refractive index 1.58 and cladding refractive index of 1.52.	CO3	L3	4M

UNIT-IV

7	a	What is Fermi level? Prove that the Fermi level is lies exactly in between conduction band and valance band of intrinsic semiconductor.	CO4	L1	6M
	b	Determine the energy band gap of the intrinsic semiconductor	CO4	L3	6M

OR

8	a	Describe the Hall Effect in semiconductors.	CO4	L2	8M
	b	What are the applications of Hall Effect.	CO4	L1	4M

UNIT-V

9	a	What is Meissner effect? Explain how Superconductors are behaving like a Diamagnetic material.	CO5	L2	6M
	b	Explain the Type-I and Type-II superconductors.	CO5	L2	6M

OR

10	a	What are nanomaterials? Write the classification of nanomaterials.	CO5	L1	6M
	b	Explain magnetic and optical properties of nanomaterials.	CO5	L2	6M

*** END ***

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. I Year I Semester Supplementary Examinations June/July-2025
APPLIED CHEMISTRY
(Common to ECE & EEE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	a	Define Electrochemical cell? Explain the construction, working of an Electrochemical cell.	CO1	L1	6M
	b	Write a short note on Ni-cd (NICAD) battery.	CO1	L2	6M

OR

2	Define Fuel cell? Describe the construction and working principle and uses of Hydrogen-Oxygen fuel cell.	CO1	L2	12M

UNIT-II

3	a	Write the postulates of molecular orbital theory.	CO2	L2	6M
	b	Sketch the molecular orbital energy diagram for Oxygen (O_2).	CO2	L3	6M

OR

4	a	Explain Planck's quantum theory.	CO2	L2	6M
	b	Write short notes on wave-particle duality of matter.	CO2	L2	6M

UNIT-III

5	a	Define polymerization? Explain chain growth and step growth polymerization with examples.	CO3	L2	8M
	b	Write the preparation and application of Buna-S rubber.	CO3	L3	4M

OR

6	a	Describe the preparation, properties and uses of Bakelite.	CO3	L3	8M
	b	Explain functionality of monomer.	CO3	L2	4M

UNIT-IV

7	Explain principle, instrumentation and applications of UV-visible spectroscopy with neatdiagram.	CO4	L2	12M

OR

8	a	Explain the principle and instrumentation of Gas Chromatography.	CO4	L2	8M
	b	Write any four applications of Gas Chromatography.	CO4	L2	4M

UNIT-V

9	a	Define super conductors.	CO5	L1	2M
	b	Discuss about the principle and application of Super conductors and their applications?	CO5	L1	10M

OR

10	a	What is basic lock and key principle?	CO5	L1	6M
	b	Write a short note on Complementarity.	CO5	L2	6M

*** END ***

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. I Year I Semester Supplementary Examinations June/July-2025
ENGINEERING CHEMISTRY
(Mechanical Engineering)

Time: 3 Hours   Max. Marks: 60

(Answer all Five Units **5 × 12 = 60** Marks)

UNIT-I

1		Explain with a neat sketch the various steps involved in Municipal Water Treatment.	CO1	L2	12M

OR

2	a	Explain about desalination of brackish water by Reverse Osmosis.	CO1	L2	6M
	b	Explain in detail about demineralization of water by Electrodialysis.	CO1	L2	6M

UNIT-II

3	a	What is secondary Battery? Write a note on Lithium Ion Battery	CO2	L1	6M
	b	Describe the Construction and Working of Methanol– Oxygen Fuelcell.	CO2	L3	6M

OR

4	a	Define corrosion.	CO2	L1	2M
	b	Describe the oxidation corrosion with relevant chemical equation involved.	CO2	L2	10M

UNIT-III

5	a	What is polymerization?	CO3	L1	2M
	b	Explain the different types of polymerization with examples.	CO3	L2	10M

OR

6	a	Explain the Proximate analysis of coal with its significance.	CO3	L2	6M
	b	Discuss the ultimate analysis of coal and mention its importance.	CO3	L2	6M

UNIT-IV

7	a	Define composites.	CO4	L2	2M
	b	Classify the composites materials.	CO4	L2	10M

OR

8	a	What is cement? How do you classify the cement?	CO4	L1	6M
	b	Explain in detail about setting and hardening of portland cement.	CO4	L2	6M

UNIT-V

9	a	Describe the synthetic method of colloids by Condensation process.	CO5	L2	6M
	b	Explain the synthesis of colloids by Dispersion Method.	CO5	L2	6M

OR

10		Discuss the principle, instrumentation and applications of Transmission Electron Microscopy.	CO5	L2	12M

*** END ***

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. I Year I Semester Supplementary Examinations June/July-2025
C PROGRAMMING AND DATA STRUCTURES
(Common to CE, AGE, CSE, CSIT, CSM, CIC, CAD, CCC & CAI)

Time: 3 Hours   **Max. Marks: 60**

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

UNIT-I

1	a	Define a variable. Write the variable declaration. What are the rules for declaring a variable?	CO1	L2	6M
	b	Explain about data types in C.	CO1	L2	6M

OR

2		Write the syntax and illustrate the following statements with example i) if Statement ii) if else Statement iii) else if ladder iv) Nested if statements v) Switch Case	CO2	L3	12M

UNIT-II

3	a	Define function. Explain the types of functions with an example.	CO3	L1	6M
	b	Write a C program to swap two numbers using functions.	CO3	L3	6M

OR

4	a	Examine the types of storage class available in C.	CO3	L2	6M
	b	Describe about type qualifiers used in C.	CO2	L2	6M

UNIT-III

5	a	Explain the concept of array of pointers with examples.	CO3	L2	8M
	b	What are the features of pointers? Write a C program to print address of a variable.	CO3	L6	4M

OR

6	a	Explain about pointers to structure.	CO3	L2	6M
	b	Explain about nested structures.	CO3	L2	6M

UNIT-IV

7	a	Differentiate between stack and queue	CO5	L4	6M
	b	Explain briefly about various types of linked lists with suitable examples.	CO6	L2	6M

OR

8		Explain briefly about circular linked list and circular double linked list with suitable example.	CO6	L2	12M

UNIT-V

9		Discuss the algorithm to sort the elements using exchange sort.	CO6	L2	12M

OR

10		Define sorting. Explain any three sorting techniques with example.	CO6	L1	12M

*** END ***

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. I Year I Semester Supplementary Examinations June/July-2025
THERMAL AND FLUID ENGINEERING
(Electrical & Electronics Engineering)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	Explain briefly about cooling towers and Coal handling with neat diagram.	CO1	L1	12M

OR

2	a	Describe in detail about Quasi Static Process with schematic diagram.	CO2	L1	6M
	b	What is thermodynamic equilibrium? Explain it in detail.	CO2	L1	6M

UNIT-II

3	Draw and explain a P.V, P-T and T-S diagram for a pure substance.	CO2	L2	12M

OR

4	Explain Lamont boiler with neat sketch.	CO3	L2	12M

UNIT-III

5	What is manometer and classify it.? Explain U tube manometer with neat diagram.	CO5	L1	12M

OR

6	a	Derive an expression for capillary rise and fall in a glass tube	CO4	L3	6M
	b	The capillary rise in the glass tube is not to exceed 0.2mm of water. Determine its minimum size, given that surface tension for water in contact with air = 0.0725 N/m.	CO5	L5	6M

UNIT-IV

7	Explain about Energy gradient line and Hydraulic gradient line.	CO6	L2	12M

OR

8	Derive an equation for Darcy Weisbach equation.	CO5	L3	12M

UNIT-V

9	a	A jet of water of diameter 7.5cm moving with a velocity of 25m/s, strikes a fixed plate in such a way that the angle between the jet and plate is 60°. Find the force extracted by Jet (i) in the direction normal to the plate. (ii) in the direction of jet.	CO5	L5	6M
	b	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.	CO5	L3	6M

OR

10	Draw the neat sketch of Modern Francis turbine and explain its working.	CO6	L1	12M

*** END ***

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
## (AUTONOMOUS)
B.Tech. I Year I Semester Supplementary Examinations June/July-2025
BASIC ELECTRICAL & ELECTRONICS ENGINEERING
(Mechanical Enbgineering)

Time: 3 Hours   **Max. Marks: 60**

*Note: Answer PART-A from pages 2 to 20 and PART-B from 21 to 39.

(Answer all Six Units 6 X 10 = 60 Marks)
PART-A
UNIT-I

1	a	State and explain Ohm's law.	CO1	L1	5M
	b	For the given circuit as shown in figure find the voltage across 10 ohm resistor and the current passing through it.	CO1	L2	5M
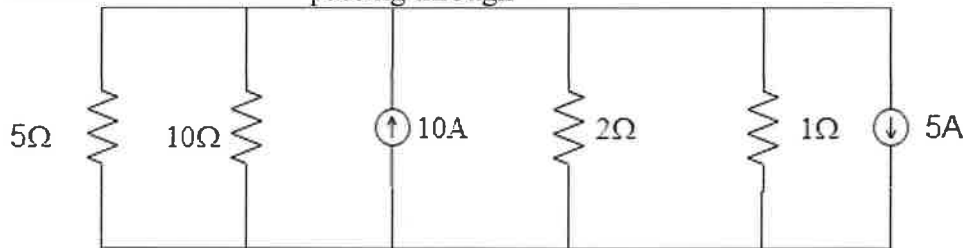
OR

2	Explain principle of AC voltages with neat diagram and waveform.	CO1	L2	10M

UNIT-II

3	Write the constructional features of a DC machine with neat diagram.	CO2	L2	10M

OR

4	Explain Long Shunt Compound Generator and short shunt generator with neat diagram.	CO2	L2	10M

UNIT-III

5	a	Discuss about the principle of operation of DC motors	CO3	L2	5M
	b	Calculate the value of torque established by the armature of a 4-pole DC motor having 774 conductors, 2 paths in parallel, 24mwb flux per pole when the total armature current is 50A.	CO3	L3	5M

OR

6	Briefly discuss about various types of DC motors with neat sketches.	CO3	L2	10M

PART-B
UNIT-IV

7	a	Define Doping and explain about P-and N-type semiconductors	CO5	L2	5M
	b	Explain in detail about diffusion current.	CO5	L2	5M

OR

8	Explain the working principle of Bridge Rectifier with neat circuit diagram. Also draw its input and output waveforms	CO5	L2	10M

UNIT-V

9	With neat diagram, explain the Input and Output characteristics of a BJT in CB Configuration	CO5	L2	10M

OR

10	Explain the Fixed Bias of a BJT with a neat diagram.	CO5	L2	10M

UNIT-VI

11	Describe the working principle of N-channel JFET.	CO6	L2	10M

OR

12	With the help of neat diagram, explain the operation and characteristics of N-channel Depletion type MOSFET under Enhancement mode	CO6	L3	10M

*** END ***

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. I Year I Semester Supplementary Examinations June/July-2025
ENGINEERING MATERIALS
(Civil Engineering)

Time: 3 Hours

Max. Marks: 60

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

UNIT-I

1		List the types of defects in clay bricks. Explain briefly on each defect.	CO1	L3	12M

OR

2	a	Write the various uses of stones.	CO1	L2	6M
	b	List the characteristics of good building stones.	CO1	L2	6M

UNIT-II

3	a	What are the initial and final setting times of cement? What is their importance?	CO2	L1	6M
	b	What precautions should be taken while storing cement?	CO2	L1	6M

OR

4		What is meant by workability of concrete? How is it tested in field and in laboratory?	CO2	L4	12M

UNIT-III

5		Describe in details the types of defects in paint works.	CO3	L2	12M

OR

6	a	State the characteristics of good timber.	CO3	L2	6M
	b	What are dry and wet rots? How are they caused and prevented?	CO3	L2	6M

UNIT-IV

7		Specify some important uses of cast iron, wrought iron and mild steel.	CO4	L1	12M

OR

8		What are smart materials? Explain their applications in civil engineering field?	CO4	L3	12M

UNIT-V

9		What are the various types of bitumen and what are their uses.	CO5	L1	12M

OR

10		Describe the penetration test on bitumen.	CO5	L2	12M

*** END ***

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. I Year I Semester Supplementary Examinations June/July-2025
BASIC THERMODYNAMICS
(Agricultural Engineering)

Time: 3 Hours　　　　　　　　　　　　　　　　　　　　　**Max. Marks: 60**

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

UNIT-I

1	a	What do mean by property? Distinguish between intensive and extensive property	CO1	L1	6M
	b	Show that work is a path function and not a property.	CO1	L2	6M

OR

2	Explain about Work and Heat transfer. And classify the work transfers.	CO1	L4	12M

UNIT-II

3	What is Steady Flow Process? Derive Steady Flow Energy Equation (SFEE) for an open system.	CO2	L4	12M

OR

4	a	Give are the limitations of the First law of Thermodynamics?	CO2	L2	6M
	b	Derive an expression for entropy changes for open systems.	CO2	L4	6M

UNIT-III

5	Derive the equation for computing the entropy change of an Ideal gas.	CO3	L4	12M

OR

6	Derive the equation for work done in a reversible adiabatic process.	CO3	L4	12M

UNIT-IV

7	Deduce an expression for Carnot Cycle and efficiency of cycle.	CO4	L4	12M

OR

8	Develop the expression for air standard efficiency for sterling cycle.	CO4	L4	12M

UNIT-V

9	Describe the different operations of Rankine cycle and also derive the expression for its efficiency.	CO5	L4	12M

OR

10	a	Compare Rankine cycle with Carnot cycle.	CO5	L4	6M
	b	Explain with the help of neat diagram of Reheat cycle and Draw its T-S & H-S diagram.	CO5	L2	6M

*** END ***

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. I Year I Semester Supplementary Examinations June/July-2025
ENGINEERING GRAPHICS
(Common to ECE, ME & EEE)

Time: 3 Hours   **Max. Marks: 60**

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

UNIT-I

1 The vertex of a hyperbola is 60 mm from its focus. Draw the curve, if   CO1 L4 12M
the eccentricity is 3/2. Draw a normal and a tangent at a point on the curve,
75 mm from the directrix.

OR

2 Develop the involute of a circle of side diameter 50 mm. Draw a tangent   CO1 L6 12M
and normal to the curve at a distance of 100 mm from the center of the
circle.

UNIT-II

3 A point A is 20mm above the HP and 50mm in front of the VP. Another   CO2 L3 12M
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 Front views
and Top views.

OR

4 A line PQ 80mm long has its end P 10mm above HP and 15mm in front of   CO2 L3 12M
VP. The other end Q is 65mm above HP and 50mm in front of VP. Draw
the projections of the line and Find its true inclinations with HP & VP.

UNIT-III

5 A regular hexagonal plane of 30 mm side has a corner on HP, and its   CO3 L3 12M
surface is inclined at 45^0 to HP. Draw the projections, when the diagonal
through the corner, which is on HP makes 30^0 with VP.

OR

6 A cylinder of base diameter 5mm and axis 70 mm has a generator   CO3 L3 12M
in the VP and inclined at 45° to the HP. Draw its projections.

UNIT-IV

7 A cube of side 40 mm is resting on HP on one of its faces, with a vertical   CO4 L6 12M
face inclined at 30^0 to VP. It is cut by a section plane inclined at 45^0 to HP
and passing through the axis at 8 mm from the top surface. Draw the
projections of the solid and also show the true shape of the section.

OR

8 A square prism of side of base 40 mm and axis 80 mm long, is resting on   CO4 L3 12M
its base on HP such that, a rectangular face of it is parallel to VP. Draw
the development of the prism.

9   Draw three views of the blocks shown pictorially in figure according   **CO5**   **L3**   **12M**
to first angle projection.
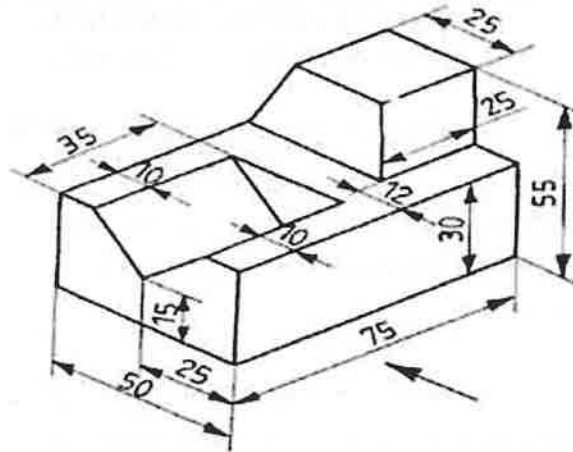
OR

10   Draw the isometric projection of the frustum of a hexagonal pyramid of   **CO5**   **L3**   **12M**
base side 40 mm , top side 25mm, and height 70mm rests with its base on
HP with one of its base edge is parallel to VP.

*** END ***

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. I Year I Semester Supplementary Examinations June/July-2025
BASIC ELECTRONICS ENGINEERING
(Common to CSE,CSM, CAD, CAI, CCC, CSIT & CIC)

Time: 3 Hours   **Max. Marks: 60**

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

UNIT-I

1	a	Compare and contrast the electrical properties of Silicon and Germanium.	CO1	L2	8M
	b	What is meant by doping in semiconductors? What is the need for doping?	CO1	L2	4M

OR

2	a	Distinguish between conductors, semiconductors and insulators.	CO1	L2	8M
	b	Explain the crystal structure of silicon with a neat sketch.	CO1	L2	4M

UNIT-II

3	a	Analyze the current components in a PN diode and derive the expression for diode current.	CO1	L4	8M
	b	Define and discuss the barrier potential of a PN junction diode with a neat sketch.	CO1	L2	4M

OR

4	a	Discuss about Breakdown mechanisms in PN Junction Diode.	CO1	L2	6M
	b	Define Transition and Diffusion capacitances of a PN junction Diode.	CO1	L2	6M

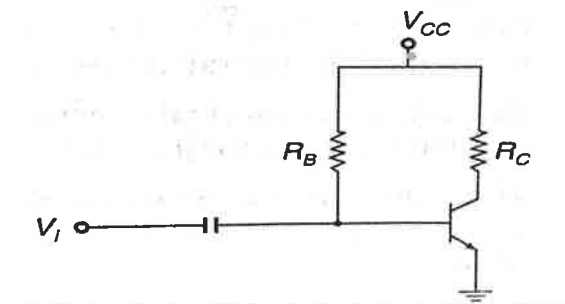## UNIT-III

5	a	Draw the circuit diagram of a Full wave rectifier and with the help of waveforms describe its operation.	CO3	L2	6M
	b	Derive the expressions for Average DC current, Average DC Voltage, RMS Value of Current, DC Power Output, AC Power input and Efficiency of a Full Wave Rectifier.	CO2	L3	6M

OR

6	a	Explain the construction and working principle of CLC or π section filter along with derivation for its ripple factor.	CO3	L3	8M
	b	Compare various types of filters.	CO3	L2	4M

UNIT-IV

7	a	Discuss about the different types of biasing.	CO2	L2	6M
	b	Design the circuit shown in figure given Q-point values are to be I_{CQ} =1mA and V_{CEQ} = 6V. Assume that V_{CC} = 10V, β= 100, V_{BEsat} = 0.7 V.	CO6	L4	6M

OR

8	a	Explain the Input and Output characteristics of a BJT in CC Configuration.	CO1	L2	6M
	b	Derive the relation between α, β and ϒ of a Transistor.	CO2	L3	6M

UNIT-V

9	a	Explain the construction and working principle of N-channel JFET.	CO4	L2	6M
	b	List the differences between depletion and enhancement MOSFET.	CO4	L2	6M

OR

10	a	Derive the Drain to Source resistance, Trans-conductance and amplification factor from Characteristics of JFET.	CO4	L4	6M
	b	Discuss the merits of the voltage divider bias.	CO6	L2	6M

*** END ***

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. I Year I Semester Supplementary Examinations June/July-2025
PRINCIPLES OF ELECTRICAL CIRCUITS
(Electronics and Communications Engineering)

**Time: 3 Hours**   **Max. Marks: 60**

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

UNIT-I

|					
1	**a**	State and explain Ohm's law with limitations.	CO1	L2	6M
	b	State and prove Kirchhoff's voltage law with suitable examples.	CO1	L3	3M
	c	State and prove Kirchhoff's current law with suitable examples.	CO1	L3	3M

OR

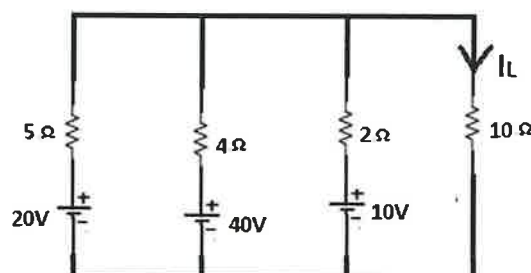|					
2		Find the voltage to be applied across AB in order to drive a current of 5A into the circuit.	CO1	L3	12M
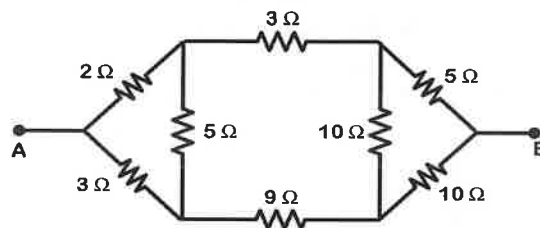
UNIT-II

3	**a**	State &explain Thevenin's theorem.	CO3	L1	4M
	b	Find load current by using Thevenin's theorem for the following circuit where RL =3Ω.	CO3	L3	8M
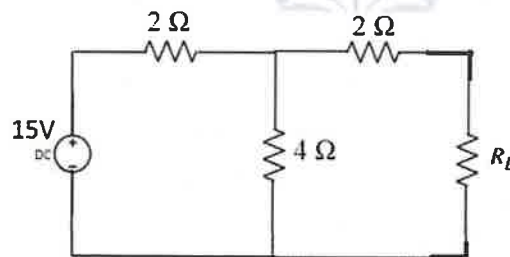
OR

4	**a**	State & explain Milliman's theorem.	CO3	L3	6M
	b	Find the current IL, use millman's theorem as shown in figure below.	CO3	L3	6M

UNIT-III

5	**a**	A series RC circuit consists of a resistor of 10Ω and capacitor of 0.1 F with a constant voltage of 20v, is applied to the circuit at t=0.Obtain the current equation. Determine the voltage across the resistor and the capacitor.	CO4	L4	6M

	b Define the term initial conditions and transient response.	CO4	L2	6M

OR

6	A Series RC circuit consists of R=5000Ω,C=20MF has a constant voltage V=100v applied at t=0 and capacitor has no initial charge. Find the equation of i, VR and VC.	CO4	L4	12M

UNIT-IV

|				
7	**a** Define power factor and form factor.	CO5	L2	6M
	b Derive an expression for the current and impedance for a series RL circuit excited by a Sinusoidally alternating voltage. Draw the phasor diagrams.	CO5	L2	6M

OR

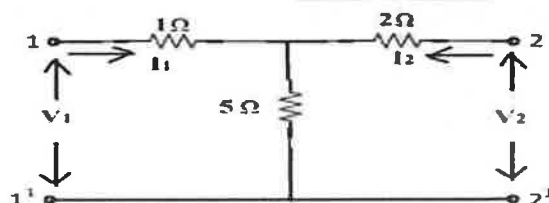|				
8	Derive an expression for the voltage and impedance for a series RLC circuit excited by a Sinusoidally alternating voltage.	CO5	L4	12M

UNIT-V

9	**a** Determine the y-parameters of the following network.	CO6	L4	6M
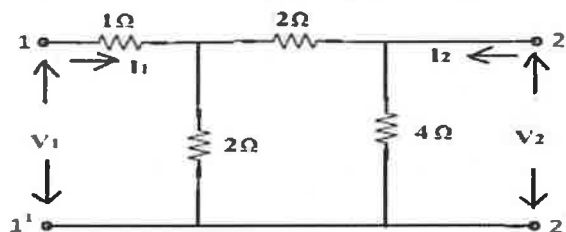
	b Find the transmission parameters for the circuit shown in figure.	CO6	L2	6M

OR

10	**a** List the advantage of constant K filter.	CO6	L2	4M
	b Design a High –pass filter having a cut-off frequency of 1kHz with a load resistance of 600Ω.	CO6	L2	8M

*** END ***

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. I Year I Semester Supplementary Examinations June/July-2025
ALGEBRA AND CALCULUS
(Common to All)

Time: 3 Hours   **Max. Marks: 60**

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

UNIT-I

1	a	Reduce the matrix A=$\begin{bmatrix} -2 & -1 & -3 & -1 \\ 1 & 2 & 3 & -1 \\ 1 & 0 & 1 & 1 \\ 0 & 1 & 1 & -1 \end{bmatrix}$ into Echelon form and find its rank?	CO1	L1	6M
	b	Show that the equations $x + y + z = 4$; $2x + 5y - 2z = 3$; $x + 7y - 7z = 5$ are not consistent.	CO1	L2	6M

OR

2		Show that the matrix $A = \begin{bmatrix} 1 & -2 & 2 \\ 1 & 2 & 3 \\ 0 & -1 & 2 \end{bmatrix}$ satisfies its characteristic equation and find A^{-1} by using Cayley - Hamilton theorem.	CO1	L3	12M

UNIT-II

3	a	Verify Lagrange's mean value theorem for f(x)=$x^3 - x^2 - 5x + 3$ in$[0,4]$	CO2	L3	6M
	b	Using Maclaurin's series expand $\tan x$ upto the fourth power of x and hence find the series for log (sec x).	CO2	L3	6M

OR

4	a	Verify if $u = 2x - y + 3z$,$v = 2x - y - z$, $w = 2x - y + z$ are functionally dependent and if so, find the relation between them	CO2	L3	6M
	b	Find the shortest distance from origin to the surface $xyz^2 = 2$.	CO2	L2	6M

UNIT-III

5	a	Evaluate $\int_0^1 \frac{(\sin^{-1} x)^3}{\sqrt{1-x^2}} dx$	CO3	L2	6M
	b	Evaluate $\int_0^a \int_0^{\sqrt{a^2-y^2}} (x^2 + y^2) dy dx$	CO3	L2	6M

OR

6	a	By changing the order of integration, evaluate $\int_0^{4a} \int_{\frac{x^2}{4a}}^{2\sqrt{ax}} dy dx$.	CO3	L2	6M
	b	Evaluate $\int_0^1 \int_0^{\sqrt{1-x^2}} \int_0^{\sqrt{1-x^2-y^2}} \frac{dx dy dz}{\sqrt{1 - x^2 - y^2 - z^2}}$	CO3	L2	6M

UNIT-IV

7	a	Show that $\nabla(r^n) = n \, r^{n-2} \bar{r}$	CO4	L2	6M
	b	Find the divergence of $\bar{f} = (xyz)\vec{i} + (3x^2y)\vec{j} + (xz^2 - y^2z)\vec{k}$.	CO4	L3	6M

8 a If $\bar{f} = (x + 2y + az)\vec{i} + (bx - 3y - z)\vec{j} + (4x + cy + 2z)\vec{k}$ is irrotational then find the constants a, b and c. CO4 L3 6M

   b Prove that $div\ (curl\ \bar{f}) = 0$ where $\bar{f}$ is vector point function. CO4 L3 6M

UNIT-V

9 a Find the work done by a force $\bar{F} = (2y + 3)\vec{i} + (xz)\vec{j} + (yz - x)\vec{k}$ when it moves a particle from $(0,0,0)$ to $(2,1,1)$ along the curve $x = 2t^2; y = t; z = t^3$ CO5 L3 6M

   b Evaluate by Green's theorem $\oint_c (y - sinx)dx + cosxdy$ where 'c' is the triangle enclosed by the lines $y = 0, x = \frac{\pi}{2}$ and $\pi y = 2x$. CO5 L2 6M

OR

10 Verify Gauss's divergence theorem for $\bar{F} = (x^3 - yz)\vec{i} - 2x^2y\vec{j} + z\vec{k}$ taken over the surface of the cube bounded by the planes $x = y = z = a$ and coordinate planes. CO5 L3 12M

*** END ***

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations June-2025
COMMUNICATIVE ENGLISH
(ECE,EEE & ME)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	a	Bring out the central theme of the story "Half a Rupee Worth."	CO1	L1	6M
	b	What is the structure of a paragraph?	CO1	L1	6M

OR

2	a	Write a paragraph on *The Role of Festivals in Society.*	CO1	L3	6M
	b	Write a letter to your friend describing the recent Ahmedabad plane crash incident.	CO1	L3	6M

UNIT-II

3	a	Why was Gangi unable to get water from anywhere when the story opens?	CO2	L2	6M
	b	Fill in the blanks with suitable articles:	CO2	L2	6M

    i. We met ___ old friend at the mall.
    ii. ___ Amazon River is one of the longest rivers in the world.
    iii. Can you hand me ___ pen, please?
    iv. They adopted ___ dog from the shelter.
    v. I need ___ umbrella. It's raining.
    vi. ___ sun rises in the east.

OR

4	a	Frame six sentences with cohesive devices.	CO2	L3	6M
	b	How does Self-confidence help an individual in achieving success?	CO2	L2	6M

UNIT-III

5	a	How does the poem "I am not that Woman" bring out the hidden potential and rebellion spirit of the speaker?	CO3	L2	6M
	b	What is emotional intelligence and how does it affect the work efficiency of an individual?	CO3	L2	6M

OR

6	a	Read the following passage and answer the question given below.	CO3	L2	6M

Honeybees are small insects, but they play a big role in nature and agriculture. They help pollinate many of the plants we rely on for food. When a bee collects nectar from a flower, pollen sticks to its body. As it moves from flower to flower, it spreads this pollen, helping plants to reproduce. Without bees, the pollination of fruits, vegetables, and nuts would decrease significantly, leading to lower food production. In recent years, scientists have become concerned about the declining bee population. Pesticides, loss of habitat, and disease are some of the main threats to bees.

To protect bees, people are planting more wildflowers, reducing pesticide use, and creating environments that support bee health. These efforts are essential to ensure that bees continue to help produce the food we eat every day.

Questions

1. What is the main role of honeybees described in the passage?

A) Producing honey for humans B) Helping plants grow by pollination
C) Attacking pests in gardens   D) Spreading seeds
2. What happens when a bee visits a flower?
A) It damages the flower's petals   B) It drinks the flower's water
C) It spreads pollen to help the plant reproduce D) It lays eggs in the flower
3. Which of the following is NOT mentioned as a threat to bees?
A) Pesticides   B) Weather changes C) Loss of habitat   D) Disease
4. Why is it important to protect bees?
A) Because they live in beautiful hives
B) So they can pollinate flowers and help produce food
C) To reduce honey imports   D) To keep parks clean
5. What is one way people are helping bees?
A) Using more chemical sprays B) Removing wildflowers
C) Reducing pesticide use   D) Catching bees in nets
6) Provide a title for the given passage.

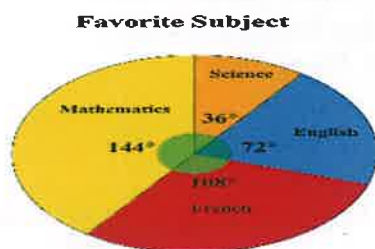|					
	b	Describe the types of listening.	CO3	L1	6M

UNIT-IV

7	a	Write an essay about your opinion on dowry as a social evil with a special reference to Sarada's marriage from the story *What is my name?*	CO4	L3	6M
	b	Study the information given in the pie chart (about students' favourite subjects) and write your interpretation.	CO4	L3	6M

Favorite Subject

OR

8	a	Write any six meaningful sentences using Quantifiers.	CO4	L3	6M
	b	Write a paragraph on comparing and contrasting summer season with winter season.	CO4	L3	6M

UNIT-V

9	a	Write a short note on Short term and Long term goals.	CO5	L1	6M
	b	What kind of life did Kalam's father lead as in the essay "The Power of Prayer"?	CO5	L1	6M

OR

10	a	Write an essay on *The Mental Health Crisis Among Youth in the Digital Era*	CO5	L3	6M
	b	What is the difference between Scanning and Skimming?	CO5	L1	6M

*** END ***

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations June 2025
PRINCIPLES OF ELECTRICAL ENGINEERING
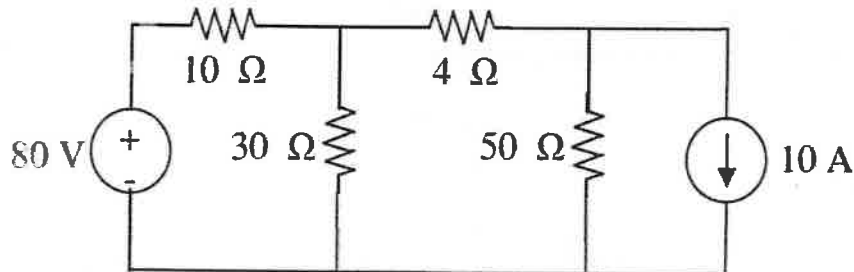(CSE,CSIT,CSM,CIC,CAD,CCC,CAI)

Time: 3 Hours   **Max. Marks: 60**

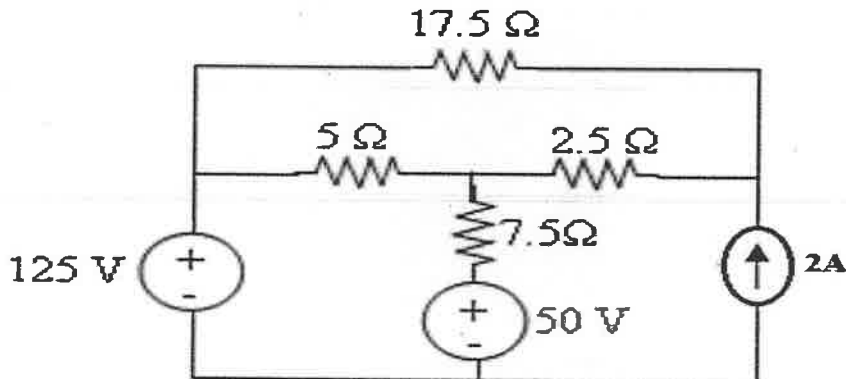(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	**a**	State and explain Kirchhoff's laws.	CO1	L2	6M
	b	Verify Superposition Theorem for 4Ω resistor for the following circuit.	CO1	L3	6M

OR

2	**a**	State and explain Norton's Theorem.	CO1	L2	6M
	b	Use KCL to find node voltages for the circuit shown below.	CO1	L3	6M

UNIT-II

3	**a**	Derive an expression for average value of sine wave form.	CO2	L3	6M
	b	A resistor of 25Ω and inductance of 60mH are connected in series across 100V, 50Hz supply. Determine the following (i) Impedance (ii) power factor	CO2	L3	6M

OR

4	**a**	An alternating current is expressed as I = 14.14 sin 314t. Determine. (i) Maximum current (ii) RMS current (iii) Frequency (iv) Instantaneous current when t = 0.02 msec	CO2	L3	6M
	b	Derive an expression for the current and impedance for a series RC circuit excited by a Sinusoidally alternating voltage. Draw the phasor diagrams.	CO2	L4	6M

UNIT-III

5		Explain about the Working principle of a DC generator.	CO3	L3	12M

OR

6	**a**	A 220V DC motor has armature resistance of 0.6 Ω and current through armature is 10A. Find the induced in the motor.	CO3	L2	6M
	b	Explain OCC Characteristics of DC generator.	CO3	L3	6M

UNIT-IV

7	Explain the Working principle of single phase transformer.	CO4 L3	12M

OR

8	**a** A single phase transformer has 500 turns on primary and 1000 turns on secondary. The E.M.F per turn is 0.2. Calculate i) E.M.F induced in the primary and secondary winding. ii) The net cross-sectional are of the core for a maximum flux density of 0.045T	CO4 L3	6M
	b Write the short notes on transformer Voltage Regulation & Efficiency.	CO4 L2	6M

9	**a** Classify different types of measuring instruments.	CO5 L2	6M
	b Explain operating principles of Moving Iron and PMMC instruments.	CO5 L3	6M

OR

10	Define torque. Explain various types of torques in measuring instruments.	CO5 L3	12M

*** END ***