O.P.Code: 20HS0830 | R20 | H.T.No. | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. I Year I Semester Supplementary Examinations October/November-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 $A=\begin{bmatrix}1&2&3&2\\2&3&5&1\\1&3&4&5\end{bmatrix}$ into Echelon form and find its rank?	CO1	L2	6M
	b	Solve the system of equations x+2y+3z=0, 3x+4y+4z=0, 7x+10y+12z=0.	CO1	L2	6M
		OR			
2		Verify Cayley Hamilton theorem for $A=\begin{bmatrix}1&2&-1\\2&1&-2\\2&-2&1\end{bmatrix}$ and find A^{-1} & A^4 using Cayley-Hamilton theorem.	CO1	L2	12M

UNIT-II

3	a	Verify Lagrange's mean value theorem for $f(x) = log_e x \text{ on } [1, e]$	CO2	L2	6M
	b	Expand sin x in powers of $(x-\frac{\pi}{2})$ upto the term containing $(x-\frac{\pi}{2})^4$ by Taylor's series.	CO2	L2	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	L2	6M
	b	Find a point on the plane $3x + 2y + z - 12 = 0$ which is nearest to the origin.	CO2.	L4	6M

UNIT-III

5	a	Evaluate $\int_0^1 \int_x^{\sqrt{x}} (x^2 + y^2)dy\,dx$	CO3	L2	6M
	b	Evaluate $\int_0^1 \int_0^{\sqrt{1-x^2}} \int_0^{\sqrt{1-x^2-y^2}} xyz\,dz\,dy\,dx$	CO3	L2	6M
		OR			
6		Change the order of integration and evaluates $\int_0^1 \int_{x^2}^{2-x} xy\,dy\,dx$	CO3	L2	12M

UNIT-IV

7	a	Define Divergence of a vector point function. Find the divergence of $\bar{f} = (xyz)i + (3x^2y)j + (xz^2 - y^2z)k$	CO4	L2	6M
	b	Find the angle between the normal to the surface $xy = z^2$ at the points (4,1,2) and (3,3,-3).	CO4	L3	6M
		OR			
8	a	Show that the vector $\bar{f} = (x^2 - yz)i + (y^2 - zx)\,j + (z^2 - xy)k$ is irrotational and find its scalar potential.	CO4	L2	6M
	b	Prove that $div(curl\ \bar{f})$=0 where $\bar{f}$ is vector point function.	CO4	L2	6M

UNIT-V

9		If $\bar{F} = (x^2 + y^2)i - (2xy)j$, then evaluate $\int_C \bar{F}.dr$ where 'c' is the rectangle in xy-plane bounded by $x = 0, x = a, y = 0, y = b$.	CO5	L2	12M
		OR			
10	a	State Stoke's theorem.	CO5	L1	2M
	b	Evaluate by Green's theorem $\int_C (y - \sin x)\,dx + \cos x\,dy$ where C is the triangle enclosed by the lines y=0,x=$\frac{\pi}{2}$, $\pi y = 2x$	CO5	L2	10M

***** END *****

O.P.Code: 20HS0848	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. I Year I Semester Supplementary Examinations October/November-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	State and explain principle of superposition.	CO1	L2	6M
	b	Define interference and summarizing the importance conditions to get sustained interference.	CO1	L2	6M

OR

2	a	Describe Fraunhofer diffraction due to double slit and derive the conditions for principal maxima, secondary maxima and minima.	CO1	L2	8M
	b	A plane transmission grating having 4250 lines per cm is illuminated with sodium light normally. In the second order spectrum, the spectral lines are deviated by 300. What is the wavelength of the spectral line?	CO1	L4	4M

UNIT-II

3	a	What is (i) Unit cell (ii)space lattice (iii) Bravais Lattice iv)Lattice parameters.	CO2	L1	4M
	b	Explain the various types of crystal systems with a neat sketch and examples.	CO2	L4	8M

OR

4	a	Explain how the X-ray diffraction can be employed to determine the crystal structure.	CO2	L4	9M
	b	The Bragg's angle for reflection from the (111) plane in a FCC crystal is 19.2o for an X-ray wavelength of 1.54 A.U , Calculate cube edge of the unit cell.	CO2	L4	3M

UNIT-III

5	a	Define absorption coefficient of sound and derive it?	CO3	L4	7M
	b	A class room of volume 360 m3 has a reverberation time 1.6 seconds. Calculate the total sound absorption coefficient of the class room?	CO3	L4	5M

OR

6	a	Explain Piezoelectric effect.	CO3	L2	4M
	b	Describe the application of Ultrasonic in non-destructive testing (NDT) of material.	CO3	L2	8M

UNIT-IV

7	a	What is Hooke's law? Explain.	CO4	L1	4M
	b	Describe the behavior of a wire under an increasing load.	CO4	L2	8M

OR

8	a	Classify different types of beams.	CO4	L2	8M
	b	Obtain an expression for the internal energy due to strain.	CO4	L4	4M

UNIT-V

9	a	Explain the Type-I and Type-II superconductors.	CO5	L2	8M
	b	What is Meissner effect? Explain how Superconductors are behave like a Diamagnetic material.	CO5	L1	4M

OR

10	a	Explain Sol-Gel technique for synthesis of nanomaterial.	CO5	L2	8M
	b	What are the advantages of sol-gel process?	CO5	L1	4M

*** END ***

O.P.Code: 20HS0849	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. I Year I Semester Supplementary Examinations October/November-2025
APPLIED PHYSICS
(Common to 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	Describe the formation of Newton's ring with necessary theory with relevant diagram and derive the expressions for dark and bright fringes.	CO1	L1	8M
	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	4M
		OR			
2	a	In the study of Fraunhofer diffraction due to single slit how the diffraction fringes formed.	CO1	L2	6M
	b	Obtain conditions for bright and dark fringes in single slit diffraction pattern and draw intensity distribution.	CO1	L2	6M
		UNIT-II			
3		Derive the Maxwell's equations in differential and integral form.	CO2	L4	12M
		OR			
4	a	Explain the formation of energy bands in solids.	CO2	L2	6M
	b	Classify the solids into conductor, semiconductor & insulators based on band theory of solids.	CO2	L4	6M
		UNIT-III			
5	a	Enumerate the relation between the various Einstein's coefficients of absorption and emission of radiation.	CO3	L2	8M
	b	Explain population inversion.	CO3	L2	4M
		OR			
6	a	Describe optical fiber communication system with block diagram.	CO3	L2	8M
	b	Mention the application of optical fiber in sensors.	CO3	L1	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	L2	6M
	b	Determine the energy band gap of the intrinsic semiconductor.	CO4	L2	6M
		OR			
8	a	Explain the formation of p-n junction.	CO4	L2	6M
	b	Describe the construction and working mechanism of Photodiode.	CO4	L2	6M
		UNIT-V			
9	a	What is Meissner effect? Explain how Superconductors are behaving like a Diamagnetic material.	CO5	L2	6M
	b	Explain DC and AC Josephson effects in superconductors.	CO5	L2	6M
		OR			
10	a	Explain why surface area to volume ratio very large for nano materials.	CO5	L2	6M
	b	Explain ball milling technique for synthesis of nanomaterial.	CO5	L2	6M

***** END *****

O.P.Code: 20HS0802	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. I Year I Semester Supplementary Examinations October/November-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 electrode potential.	CO1	L1	02M
	b	Derive the Nernst equation for a single electrode potential and explain the terms in equation and write its applications.	CO1	L2	10M
		OR			
2		Define fuel cell? Describe the construction and working principle and uses of Hydrogen-Oxygen fuel cell with neat diagram?	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). Explain its bond order and magnetic property based on MOT theory.	CO2	L3	6M
		OR			
4	a	Explain the salient features of Crystal Field Theory.	CO2	L2	6M
	b	Draw the shapes of various d – orbitals and explain why they are splitted into two groups in an octahedral ligand field.	CO2	L3	6M

UNIT-III

5		Define polymerization? Explain the types of polymerizations with examples.	CO3	L2	12M
		OR			
6	a	What are conducting polymers? How are they classified?	CO3	L1	4M
	b	Write the synthesis and engineering applications of Poly acetylene conducting polymer.	CO3	L2	8M

UNIT-IV

7		Explain the principle, instrumentation & applications of UV-visible spectroscopy with neat diagram.	CO4	L2	12M
		OR			
8	a	What is meant by Chromatography? Write about main parts of HPLC. With neat diagram.	CO4	L4	9M
	b	Write about the important applications of HPLC Chromatography.	CO4	L4	3M

UNIT-V

9	a	Draw the band digrams for conductors, semi –conductors and insulators.	CO5	L3	6M
	b	Write short notes on Internsic and Externsic Semiconductors.	CO5	L2	6M
		OR			
10	a	Write a short notes on Carbon Nano Tubes.	CO5	L1	6M
	b	Write a note on Fullerenes.	CO5	L1	6M

***** END *****

O.P.Code: 20CS0501	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. I Year I Semester Supplementary Examinations October/November-2025

C PROGRAMMING AND DATA STRUCTURES

(Common to CSE, CSIT, CSM, CIC, CAD, CCC, CAI, CE, AGE)

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

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

		UNIT-I			
1	**a**	List out the various operators available in C.	**CO1**	**L1**	**2M**
	b	Discuss about following operators i. Arithmetic Operator ii. Logical Operator iii. Conditional Operator iv. Increment/Decrement Operator v. Assignment Operator	**CO1**	**L2**	**10M**
		OR			
2	**a**	List the different decision statements available in C.	**CO2**	**L4**	**4M**
	b	Discuss each decision statement with suitable example.	**CO2**	**L2**	**8M**
		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		Define String. Explain the different string handling functions with example.	**CO3**	**L4**	**12M**
		UNIT-III			
5	**a**	Define pointer. Write the syntax for declaring pointer with example.	**CO3**	**L1**	**6M**
	b	Describe about pointers and arrays.	**CO3**	**L2**	**6M**
		OR			
6	**a**	Define structure and give the general syntax for structure. Write a suitable example program.	**CO3**	**L1**	**6M**
	b	Explain to declare and initialize a structure? Mention with an example.	**CO3**	**L2**	**6M**
		UNIT-IV			
7		List the various operations that can be performed on stack? Explain with suitable example.	**CO5**	**L2**	**12M**
		OR			
8	**a**	Distinguish between singly linked list and doubly linked list.	**CO6**	**L4**	**6M**
	b	List the applications of linked list.	**CO6**	**L1**	**6M**
		UNIT-V			
9		What do you mean by Searching? Explain sequential search and binary search with suitable example.	**CO6**	**L1**	**12M**
		OR			
10		Explain the algorithm for merge sort and give a suitable example.	**CO6**	**L2**	**12M**

***** END *****

O.P.Code: 20ME0353	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. I Year I Semester Supplementary Examinations October/November-2025

THERMAL FLUID ENGINEERING

(Electrical & Electronics Engineering)

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

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

		UNIT-I			
1	**a**	Explain briefly about cooling towers and Coal handling with neat diagram.	**CO1**	**L2**	**6M**
	b	What is need of Chimney in thermal power plant and explain their types?	**CO1**	**L1**	**6M**
		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	**a**	Write short notes on Mollier Diagram and Dryness Fraction.	**CO2**	**L2**	**6M**
	b	What is a boiler? How is it classified?	**CO3**	**L3**	**6M**
		OR			
4	**a**	Explain the feed pump and economizer.	**CO2**	**L2**	**6M**
	b	What is the difference between super heater and air pre heater? Explain in detail with diagrams.	**CO2**	**L2**	**6M**
		UNIT-III			
5	**a**	Write a short note on Vapour Pressure, surface tension and capillarity.	**CO5**	**L2**	**6M**
	b	Define Atmospheric pressure, gauge pressure and absolute pressures	**CO3**	**L1**	**6M**
		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		Derive Continuity equation in one dimensional form Euler's equation of motion and Bernoulli's energy equation?	**CO4**	**L3**	**12M**
		OR			
8		Write a short note on Pipes in Series and Pipes in Parallel and derive expression for it.	**CO5**	**L2**	**12M**
		UNIT-V			
9	**a**	Find the force exerted by a jet of water of diameter 75 mm on a stationary flat plate, when the jet strikes the plate normally with velocity of 20 m/s.	**CO5**	**L5**	**6M**
	b	Derive an expression for the hydraulic efficiency when a liquid jet strikes a single fixed curved vane	**CO5**	**L4**	**6M**
		OR			
10	**a**	Explain the working of a Pelton wheel with a neat sketch .	**CO6**	**L2**	**6M**
	b	State the differences between Pelton wheel and Francis turbine.	**CO**	**L1**	**6M**

***** END *****

O.P.Code: 20EE0251	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. I Year I Semester Supplementary Examinations October/November-2025
BASIC ELECTRICAL & ELECTRONICS ENGINEERING
(Mechanical Engineering)

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)

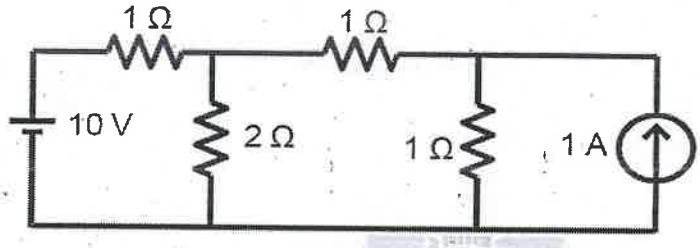
PART-A

UNIT-I

1	State and prove Kirchhoff's laws and explain with suitable example.	CO1	L2	10M
	OR			
2	Derive the expression of Star-Delta transformation and Delta to star transformation.	CO1	L3	10M

UNIT-II

3	State Super position theorem? Calculate the current in 2Ω resistor in the given circuit using super position theorem.	CO2	L3	10M



OR

4	a	Derive the EMF equation of a DC Generator.	CO2	L3	5M
	b	A 4-pole lap wound dc generator has a useful flux of 0.07wb per pole Calculate the generated emf when it is rotated at speed of 900rpm with the help of prime mover. Armature consists of 440 number of conductors calculate the generated emf, if lap wound is replaced by wave wound?	CO2	L2	5M

UNIT-III

5	a	Derive Torque equation of DC motor.	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	L3	10M

PART-B

UNIT-IV

7	a	Explain the working of a PN junction diode under forward and reverse bias.	CO4	L3	5M
	b	Distinguish between conductors, semiconductors and insulators.	CO4	L2	5M
		OR			
8	a	Define 'Ripple Factor' and derive an expression for ripple factor of Half wave rectifier.	CO4	L2	5M
	b	Show that the Zener diode can be used as a Voltage regulator with neat diagram.	CO4	L3	5M

O.P.Code: 20CE0101	R20	H.T.No.										

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

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

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

UNIT-I

1		Describe how bricks are classified.	CO1	L2	12M
		OR			
2		What is meant by rock cycle? How does it represent the sequence of formation of the three important types of rocks?	CO1	L2	12M

UNIT-II

3		Explain with flow diagrams the dry and wet process of manufacture of cement.	CO3	L2	12M
		OR			
4	a	What are the initial and final setting times of cement? What is their importance?	CO3	L2	6M
	b	What precautions should be taken while storing cement?	CO3	L2	6M

UNIT-III

5	a	Differentiate between Exogenous and Endogenous trees.	CO4	L2	6M
	b	List the properties of wood and shortly write about any three properties.	CO4	L1	6M
		OR			
6		Explain the damage caused by insects to wood.	CO4	L3	12M

UNIT-IV

7		Specify some important uses of cast iron, wrought iron and mild steel.	CO5	L2	12M
		OR			
8		Describe in detail testing of steel sections.	CO5	L3	12M

UNIT-V

9		What are the various types of bitumen and what are their uses	CO6	L2	12M
		OR			
10		What is meant by aggregate? Briefly describe their classification.	CO6	L2	12M

*** END ***

O.P.Code: 20EC0445	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. I Year I Semester Supplementary Examinations October/November-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	Explain the 2-D representation of the Germanium crystal structure with neat a sketch.	CO1	L1	4M
	b	Describe the energy band diagrams.	CO1	L2	8M
		OR			
2	a	Discuss the conduction properties of semiconductors and explain the process of electron-hole pair generation and recombination.	CO1	L2	8M
	b	Intrinsic materials are not widely used, Explain the reasons?	CO1	L1	4M

UNIT-II

3	a	A PN junction diode has a reverse saturation current of 30 μA at a temperature of 1250 C. At the same temperature calculate the dynamic resistance for 0.2 V bias in forward and reverse direction.	CO2	L3	4M
	b	Analyze the current components in a PN diode and derive the expression for diode current.	CO2	L4	8M
		OR			
4	a	Describe Transition and Diffusion capacitances of a PN junction Diode with expressions.	CO2	L5	6M
	b	Discuss about Breakdown mechanisms in PN Junction Diode.	CO2	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	L1	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.	CO3	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	6M
	b	Compare various types of filters.	CO3	L2	6M

UNIT-IV

7	a	Explain the current components of PNP transistor.	CO4	L2	6M
	b	Draw the Input and Output characteristics of a BJT in CB Configuration.	CO4	L1	6M
		OR			
8	a	Illustrate Thermistor Compensation Technique.	CO4	L3	6M
	b	Discuss about Sensistor Compensation Technique.	CO4	L2	6M

UNIT-V

9	a	Sketch the drain characteristics N-channel JFET.	CO5	L3	6M
	b	Explain the different regions of operation of N-Channel JFET.	CO5	L2	6M
		OR			
10	a	Explain voltage divider bias of JFET with neat circuit diagram.	CO6	L4	6M
	b	Discuss the merits of the voltage divider bias.	CO5	L2	6M

***** END *****

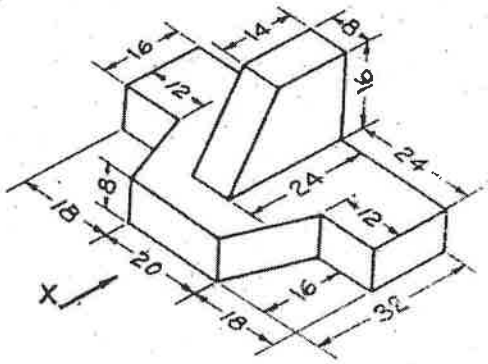
O.P.Code: 20ME0301	R20	H.T.No.									

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

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

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

	UNIT-I			
1	Construct an ellipse when the distance between the focus and directrix is 35 mm and eccentricity is 3/4. Also draw the tangent and normal to any point on the curve.	CO1	L6	12M
	OR			
2	Draw an Epi-cycloid of rolling circle of diameter 40 mm which rolls outside another circle (base circle) of 150 mm diameter for one revolution and construct a tangent and normal at any point on the curve.	CO1	L6	12M
	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 TVs.	CO2	L1	12M
	OR			
4	A line AB 50mm long, has its end A away from the HP and VP than end B. The line is inclined to the HP at 30^0 and to the VP at 45^0. Draw the projections if end A is 35mm above the HP and 50mm in front of the VP.	CO2	L1	12M
	UNIT-III			
5	A regular hexagonal plane of 30-mm side has a corner on HP, and its 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.	CO3	L6	12M
	OR			
6	A pentagonal prism of base side 30 mm and axis 60mm is resting on one of its rectangular faces on HP, with the axis parallel to VP.Draw its projections.	CO3	L6	12M
	UNIT-IV			
7	A square pyramid of base 40 mm and axis 60 mm long, Its base lies on VP with its axis parallel to HP. A cut sectional plane, 600 to VP and it pass 10mm away from the axis. Draw the projections sectional front view.	CO4	L6	12M
	OR			
8	A square prism of side of base 40 mm and axis 80 mm long, is resting on its base on HP such that, a rectangular face of it is parallel to VP. Draw the development of the prism.	CO4	L1	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.	CO5	L1	12M
	OR			
10	Draw three views of the blocks shown pictorially in figure according to first angle projection.	CO6	L6	12M



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O.P.Code: 20EE0253	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. I Year I Semester Supplementary Examinations October/November-2025

PRINCIPLES OF ELECTRICAL CIRCUITS

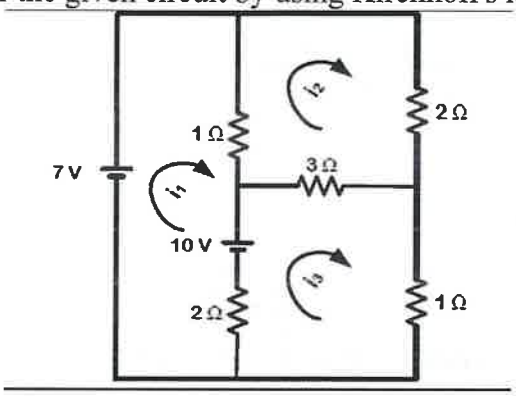
(Electronics & Communications Engineering)

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

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

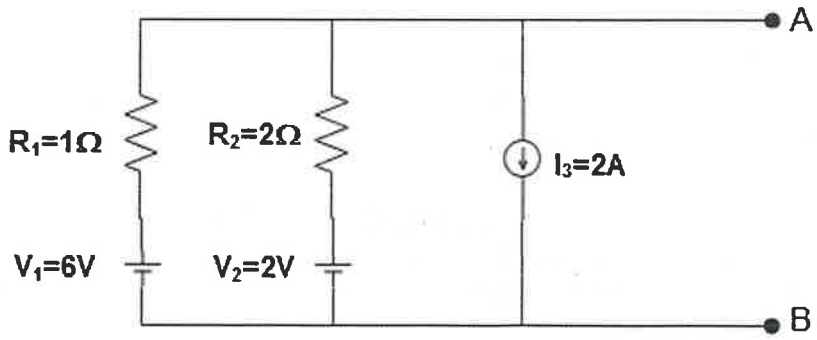
UNIT-I

1	a	Three resistances of values 20, 30 and 50 are connected in series across 20 V DC supply. Calculate, i) Equivalent resistance of the circuit. ii) Total current from the supply. iii) Voltage drop across each resistor. iv) Power dissipated in each resistor	CO1	L3	6M
	b	Find *i1, i2, i3* for the given circuit by using Kirchhoff's laws?	CO1	L3	6M



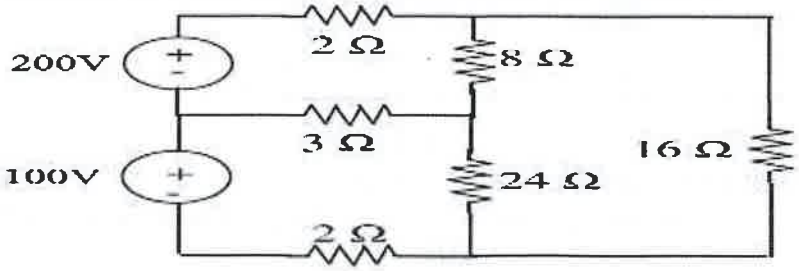
OR

2	a	Explain in detail about star to delta transformation of a resistive network.	CO1	L3	6M
	b	Determine the equivalent current source between the terminals A-B.	CO1	L3	6M



UNIT-II

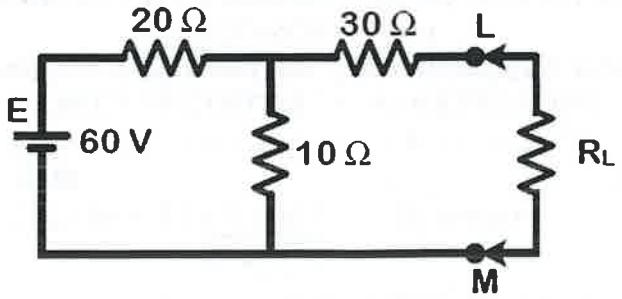
3		Determine the mesh currents for the circuit shown below.	CO2	L3	12M



OR

4	a	State and prove maximum power transfer theorem.	CO3	L3	6M

	b	Determine the maximum power delivered to the load resistance *RL*	CO3	L3	6M

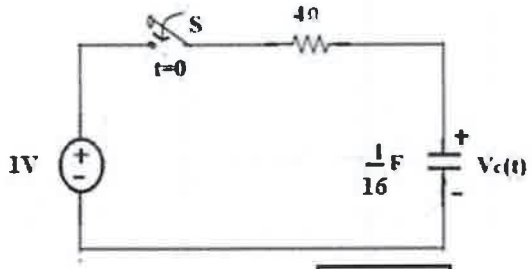


UNIT-III

5	a	Define Time constant of RL circuit.	CO4	L4	6M
	b	Define Time constant of RC circuit.	CO4	L4	6M

OR

6		Determine The Current I for T>0 If Vc(0) = 9V For The Circuit Shown In Fig.	CO4	L2	12M



UNIT-IV

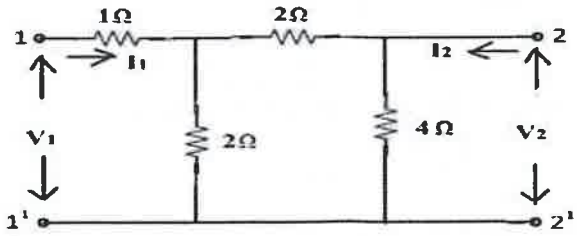
7	a	Derive an expression for average values of sine wave form	CO5	L4	6M
	b	An alternating current is expressed as I = 14.14 sin 314t. Determine. (i) Maximum current (ii) RMS current (iii) Frequency (iv)Instantaneous current when t = 0.02msec.	CO5	L2	6M

OR

8	a	A resistor of 50Ω and inductance of 100mH are connected in series across 200V, 50Hz supply. Determine the following (i) Impedance (ii) current flowing through the circuit (iii) power factor	CO5	L2	6M
	b	Define power factor and apparent power.	CO5	L4	6M

UNIT-V

9	a	Explain about h-parameters in terms of y-parameters	CO6	L2	6M
	b	Find the h-parameters of the network shown in figure.	CO6	L2	6M



OR

10	a	Explain about Constant-K band -pass filter in detail	CO6	L2	6M
	b	Design a Band-elimination filter having design impedance of 600Ω and cut-off frequencies f 1= 2kHz and f 2= 6 kHz.	CO6	L2	6M

***** END *****

O.P.Code: 20EE0250	R20	H.T.No.									

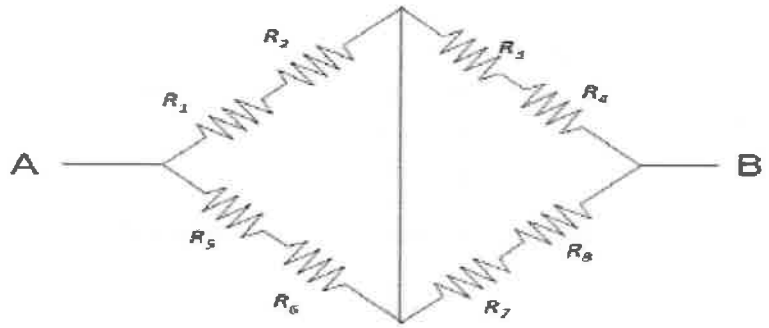
SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. I Year I Semester Supplementary Examinations October/November-2025
PRINCIPLES OF ELECTRICAL ENGINEERING
(Common to CSE, CSIT, CSM,CIC, CAD, CCC, CAI)

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

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

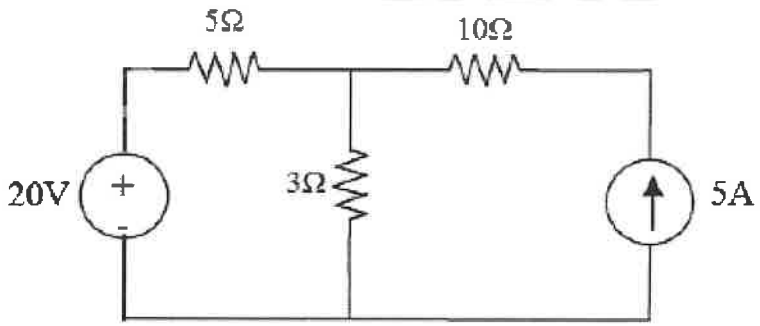
UNIT-I

1	a	Determine the Equivalent Resistance when the resistors are connected in Series & Parallel.	CO1	L1	6M
	b	Find the equivalent resistance between AB for the circuit shown bellow. $R_1=4\Omega$, $R_2=2\Omega$, $R_3=8\Omega$, $R_4=1\Omega$, $R_5=12\Omega$, $R_6=3\Omega$, $R_7=10\Omega$ & $R_8=5\Omega$	CO1	L3	6M



OR

2	a	By using superposition theorem find the current flowing through the 3ohm resistor.	CO2	L3	6M



	b	State and explain Thevenin's theorem.	CO1	L2	6M

UNIT-II

3	a	Derive an expression for RMS value of sine wave form.	CO3	L3	6M
	b	Explain power factor, admittance, and impedance.	CO3	L2	6M

OR

4	a	Derive an expression for the voltage and impedance for a series RLC circuit excited by a Sinusoidally alternating voltage	CO3	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	CO3	L3	6M

UNIT-III

5	a	List the various types of DC Generators and discuss in detail.	CO4	L2	6M
	b	Explain various losses occur in a DC Generator.	CO4	L2	6M

OR

6	a	Define Torque and derive the expression for torque in a DC.Motor.	CO4	L3	6M
	b	A 4-pole, 500V, Wave wound DC shunt motor has 720conductors on its armature. The full-load armature current is 60A and the flux per pole is 0.03Wb armature resistance is 1.2Ω and the brush contact drop is 1V/brush. Calculate the full-load speed.	CO4	L3	6M

UNIT-IV

7		Discuss Open Circuit and Short Circuit tests on single phase transformer.	CO5	L4	12M

OR

8	a	Derive an EMF equation of a single-phase transformer.	CO5	L3	6M
	b	A230/110V, 1KVA, single phase transformer is connected to 230V, A.C Supply. Calculate (i) Primary current (ii)Secondary current	CO5	L3	6M

UNIT-V

9		Discuss the operating principles and essential features of measuring instruments.	CO6	L2	12M

OR

10		Explain operating principle of Permanent Magnet Moving Coil (PMMC) instruments	CO6	L2	12M

***** END *****