O.P.Code: 23ME0302(a)	R23	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B Tech. I Year II Semester Regular Examinations July-2024

ENGINEERING GRAPHICS

(Common to CAD, CIC & CAI)

Time: 3 Hours **Max. Marks: 70**

(Answer all the Questions **5 x 14 = 70** Marks)

UNIT-I

1	a	Divide a line AB=157mm into 8 equal parts by line division method.	CO1	L1	7M
	b	Construct a regular Hexagon of base side 30mm by general method.	CO1	L2	7M
		OR			
2		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.	CO1	L6	14M

UNIT-II

3		Draw the projections of the following points, keeping the distance between the projectors as 25mm on the same reference lines. A – 20mm above HP and 30mm in front of VP B – 20mm above HP and 30mm behind VP C – 20mm below HP and 30mm behind VP D – 20mm below HP and 30mm in front of VP E – On HP and 30mm in front of VP F – On VP and 20mm above HP G – Lying on both HP and VP	CO2	L1	14M
		OR			
4		A semi circular plane of diameter 70mm has its straight edge on the VP and inclined at 30° to the HP .Draw the projection of the plane when its surface is inclined at 45^{0} to VP.	CO3	L6	14M

UNIT-III

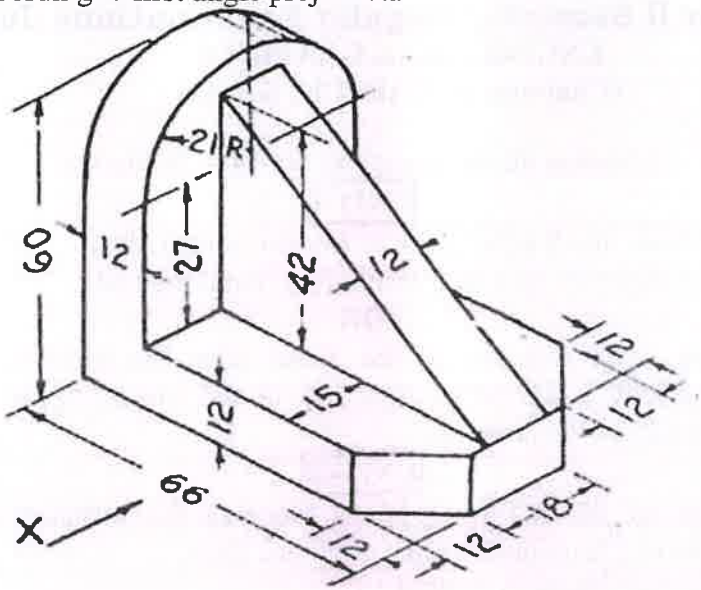
5		A pentagonal pyramid of base edge 30mm and axis 60mm rests on an edge of its base in the HP. Its axis is parallel to VP and inclined at 45° to the HP. Draw its projections.	CO3	L6	14M
		OR			
6		Draw the projections of a hexagonal prism of base side 25mm and axis 60mm long, when it is resting on one of its corners of the base on H.P. The axis of the solid is inclined at 45^{0} to H.P	CO3	L6	14M

UNIT-IV

7		A hexagonal prism of side of base 30 mm and length of axis 75 mm is resting on its base on HP. It is cut by a section plane inclined at 45^{0} to HP and passing through top corner. Draw the front and sectional top views of the solid and true shape of the section.	CO4	L6	14M
		OR			
8		A square pyramid of base 40 mm and axis 60 mm long, Its base lies on VP with its axis parallel to HP. A cut sectional plane, 60^{0} to VP and bisect the axis. Draw the projections sectional front view and true shape of the section	CO4	L6	14M

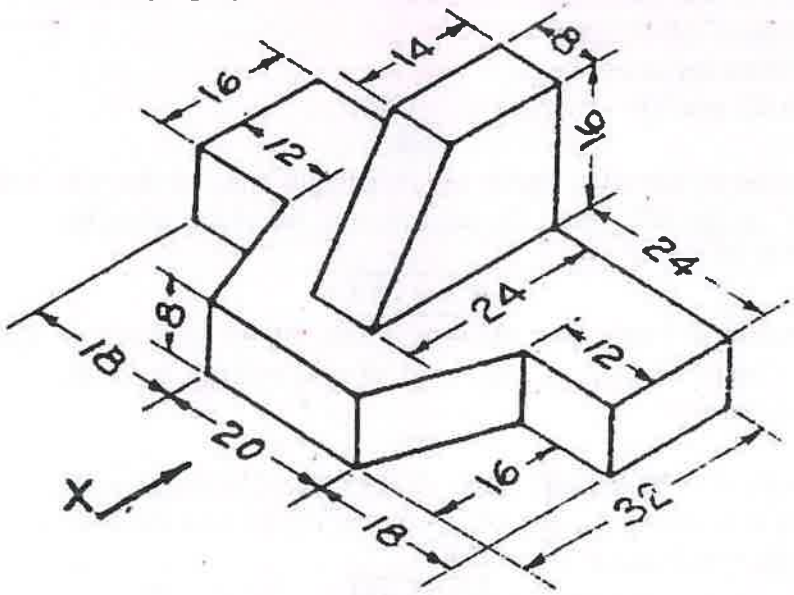
UNIT-V

9	Draw three views of the blocks shown pictorially in figure according to first angle projection.	CO6	L6	14M



OR

10	Draw three views of the blocks shown pictorially in figure according to first angle projection.	CO6	L6	14M



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O.P.Code: 23EE0201(a)	R23	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech I Year II Semester Regular Examinations July-2024
BASIC ELECTRICAL & ELECTRONICS ENGINEERING
(Common to CE, ME, CSM & CCC)

Time: 3 Hours **Max. Marks: 70**

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

PART-A (ELECTRICAL)

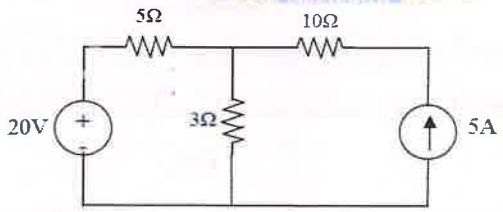
(Answer all the Questions **5 x 1 = 5** Marks)

1	a	Define Impedance.	CO1	L1	1M
	b	Define Active Power.	CO1	L1	1M
	c	Define Faradays law.	CO2	L1	1M
	d	List any Five parts of a Transformer.	CO2	L!	1M
	e	Define unit of Electrical Energy.	CO3	L1	1M

(Answer all Three Units 3 x 10 = 30 Marks) **(ELECTRICAL)**

UNIT-I

2	a	State and Explain the Super position theorem.	CO2	L2	5M
	b	By using superposition theorem find the current flowing through the 3 ohm resistor.	CO2	L4	5M



OR

3	a	Define average value and RMS value.	CO2	L1	5M
	b	Explain the Terms Apparent power and power factor.	CO3	L2	5M

UNIT-II

4		Draw and explain the construction of dc machine.	CO2	L2	10M

OR

5		Explain Working Principle of 3-Ø Induction Motor in detail.	CO1	L2	10M

UNIT-III

6		How does a nuclear plant work ? Explain with neat sketch.	CO3	L3	10M

OR

7		Explain the calculation of electricity bill for domestic consumers.	CO3	L2	10M

PART-B(ELECTRONICS)

(Answer all the Questions **5 x 1 = 5** Marks)

1	f	How PN diode is formed?	CO1	L2	1M
	g	What is meant by semiconductor?	CO1	L1	1M
	h	What is an emitter?	CO2	L1	1M
	i	List the names of universal gates with symbols.	CO4	L1	1M
	j	Write the names of basic logical operators.	CO4	L1	1M

(Answer all Thr Units 3 x 10 = 30 Marks) (ELECTRONICS)

UNIT-IV

8		Distinguish between PN Junction diode and Zener diode.	CO1	L3	10M

OR

9		With the neat sketch, Explain the operation of an NPN transistor and PNP transistor.	CO2	L3	10M

UNIT-V

10		Explain the Block diagram description of a dc power supply with a detailed explanation of all blocks.	CO2	L1	10M

OR

11		What is an Amplifier? What is a Common Emitter Amplifier?	CO2	L1	10M

UNIT-VI

12	a	What is number system? explain the different types of number systems.	CO3	L2	5M
	b	Convert the $(555)_{10}$ into binary, octal and Hexadecimal number systems.	CO3	L1	5M

OR

13		Explain Basic Theorems and properties of Boolean Algebra.	CO3	L1	10M

***** END *****

O.P.Code:23HS0810	R23	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech I Year II Semester Regular Examinations July-2024

COMMUNICATIVE ENGLISH
(Common to CSE, CSIT, EEE & ECE)

Time: 3 Hours **Max. Marks: 70**

PART-A
(Answer all the Questions **10 x 2 = 20** Marks)

1	a	Form words using the following prefixes. i. Multi----- ii.Pre-----	CO1	L2	2M
	b	Form Wh-questions for the following statements. i. I like pink colour. ii. My native place is Hyderabad.	CO1	L2	2M
	c	Where does the brook originate?	CO2	L1	2M
	d	Fill in the blanks with appropriate article. (A, An, or The) i. My sister gifted me----------watch for my wedding. ii. ----------oranges I bought were very sour.	CO2	L2	2M
	e	Describe Transtive and Intranstive Verbs?	CO3	L2	2M
	f	What are the three steps to be followed for effective Note-making?	CO3	L1	2M
	g	Write any two words often confused?	CO4	L2	2M
	h	Change the voice of the following sentences. i. Somebody has stolen my pen. ii. Mother cooks food.	CO4	L3	2M
	i	What are the four types of essays?	CO5	L1	2M
	j	Write a short note on Self-esteem.	CO5	L2	2M

PART-B
(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

2	a	How did Jim and Della prove their love for each other?	CO1	L2	5M
	b	Write a paragraph on the role of English Language in the present scenario.	CO1	L2	5M

OR

3	a	Describe Mechanics of Writing.	CO1	L2	5M
	b	Write an appropriate sentence for the following sentence patterns. i. SV ii. SVO iii. SVA iv. SVOC v. SVIODO	CO1	L2	5M

UNIT-II

4	a	Explain the lines '*I bubble into eddying bays,* *I babble on the pebbles.'* from the poem "The Brook."	CO2	L2	5M
	b	Make a list of any five cohesive devices and use them in your own sentences.	CO2	L3	5M

OR

5	a	List out any five homophones with an appropriate illustration.	CO2	L2	5M
	b	Construct a Paragraph on the following topic in 150 words. Don't judge a book by its cover.	CO2	L3	5M

UNIT-III

6	a	Write in brief about Musk's innovations.	CO3	L2	5M
	b	Explain about Drawing inferences.	CO3	L2	5M

OR

7	a	Fill in the blanks with appropriate verb forms. i. Amaravathi ----------(be) the capital of Andhra Pradesh. ii. He just----------(finish) his work. iii. Don't disturb him. He is----------(do) his homework. iv. The cat----------the snake. (catch) v. The patient had----------(die) before the doctor---------- (arrive) vi. Rita----------a mile every day. (run)	CO3	L1	6M
	b	Correct the following sentences. (Common Errors) i. Grandmother lost her reading glass. ii. I like the Mathematics very much. iii. I like the scenaries of snow world. iv. Monish has given advices.	CO3	L1	4M

UNIT-IV

8	a	You are a fresh B.Tech Student, applying for the post of a Data Analyst in TATA group, Attibele, Karnataka . Prepare your Resume with all the key skills required for the post.	CO4	L3	6M
	b	Read the following sentences and convert them into indirect speech. i. Raju told to me, "When are you leaving?" ii. The teacher said to Sam, "Why are you laughing?" iii. Granny said to me, "May God bless you." iv. The boy said, "Let me come in."	CO4	L2	4M

OR

9	a	Bring out the central theme of "The Toys of Peace."	CO4	L1	5M
	b	Write a letter to the Municipal Commissioner to inform him/her about the poor quality of roads in your locality?	CO4	L2	5M

UNIT-V

10	a	Is decision-making influenced by positive intrapersonal communication? Expalin?	CO5	L2	5M
	b	What are the steps involved in Oral Presentation?	CO5	L1	5M

OR

11	a	Read the given passage and answer the questions. Yoga is the ancient Indian system to keep a person fit in body and mind. It is basically a system of self-treatment. According to the yogic view, diseases, disorders and ailments are the results of some faulty ways of living, bad habits, lack of proper knowledge and unsuitable food. The diseases are thus the resultant state of a short or prolonged malfunctioning of the body system. Since the root cause of disease lies in the mistakes of the individual, its cure also lies in correcting the mistakes by the same individual. Thus yoga relies entirely on the effort of the patient to cure himself.	CO5	L2	5M

The yoga expert shows only the path and works no more than as a counselor. The yogic practice of treatment comprises three steps namely proper diet, proper yogic practice and proper knowledge of things concerning the self.

i. What are the benefits of yoga?

ii. Yoga is a system of------

iii. What causes diseases, ailments and disorders?

iv. How does a yoga expert work?

v. What does yoga rely on entirely?

b Simplify (Précis) the following paragraph. **CO5 L2 5M**

"Artificial intelligence is becoming increasingly important in a variety of industries, from healthcare to finance to manufacturing. This is due to the ability of AI systems to analyze large amounts of data quickly and accurately, identify patterns and trends, and make predictions based on that information. As these systems continue to evolve and improve, they are likely to have a significant impact on the way many industries operate, potentially leading to increased efficiency, cost savings, and improved outcomes for consumers."

***** END *****

O.P.Code:23HS0801	R23	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. I Year II Semester Regular Examinations July-2024
CHEMISTRY
(Common to CSE, CSIT, EEE & ECE)

Time: 3 Hours **Max. Marks: 70**

PART-A

(Answer all the Questions **10 x 2 = 20** Marks)

1	a	Write short notes on Wave-Particle duality of matter.	CO1	L2	2M
	b	Give the Significance of Ψ and Ψ2.	CO1	L1	2M
	c	What are Intrinsic and Extrinsic Semiconductors?	CO2	L1	2M
	d	Define Nanomaterial.	CO2	L1	2M
	e	Define Single electrode potential.	CO3	L1	2M
	f	Write the applications of Hydrogen Oxygen fuel cells.	CO4	L1	2M
	g	Give examples of Biodegradable polymers.	CO5	L1	2M
	h	Define Polymerization.	CO5	L1	2M
	i	Give any 4 examples of mobile phase.	CO6	L1	2M
	j	What is the Liquid chromatography?	CO6	L1	2M

PART-B

(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

2		Derive equation for a particle in one dimensional box.	CO1	L3	10M
		OR			
3		Calculate the bond order of F_2 & NO molecule and explain the magnetic properties based on MOT theory.	CO1	L3	10M

UNIT-II

4	a	Explain in detail about principle and classification of semiconducting materials.	CO2	L2	7M
	b	Summarize the important applications of Semiconductors.	CO2	L2	3M
		OR			
5	a	Explain the basic principle and Classifications of Super Capacitors.	CO2	L2	6M
	b	Discuss applications of Super Capacitors.	CO2	L2	4M

UNIT-III

6		Discuss the titration curves obtained in the following Acid – Base Conductometric titrations. a) Weak acid with weak base b) Strong acid with strong base.	CO3	L3	10M

OR

7	a	Define Fuel cell? Describe the Construction and Working principle and uses of Polymer electrolyte membrane fuel cell.	CO4	L2	6M
	b	Discuss about potentiometric sensors with examples.	CO4	L2	4M

UNIT-IV

8	a	Discuss the preparation, properties and application of Buna-S rubber and Buna-N rubber.	CO5	L2	6M
	b	Explain about synthesis, properties and applications of Poly Lactic Acid.	CO5	L2	4M

OR

9	a	Explain the preparation, properties and uses of Bakelite.	CO5	L2	5M
	b	Explain Co-ordination or Ziegler-Natta polymerization.	CO5	L2	5M

UNIT-V

10	a	What is meant by Chromatography? Write about principle and instrumentation of HPLC chromatography with neat diagram.	CO6	L2	7M
	b	What is the use of detector in chromatographic technique and what are the different types of detectors used in HPLC technique.	CO6	L2	3M

OR

11	a	Discuss about different components in HPLC technique.	CO6	L2	5M
	b	Explain in detail about Stretching and bending vibrations.	CO6	L2	5M

***** END *****

O.P.Code: 23HS0840	R23	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech. I Year II Semester Regular Examinations July-2024

ENGINEERING PHYSICS
(Common to CE, ME, CSM, CCC, CAD, CIC & CAI)

Time: 3 Hours **Max. Marks: 70**

PART-A
(Answer all the Questions **10 x 2 = 20** Marks)

1	a	Define Diffraction.	CO1	L1	2M
	b	What is plane polarized light?	CO1	L1	2M
	c	Define unit cell .	CO2	L1	2M
	d	Draw the planes for given Miller indices (100) and (111) in cubic system.	CO2	L3	2M
	e	Define dielectric polarization.	CO3	L1	2M
	f	Define magnetic susceptibility and magnetization.	CO4	L1	2M
	g	What is drift velocity?	CO5	L1	2M
	h	What is Fermi energy level?	CO5	L1	2M
	i	Write any two difference between Intrinsic and Extrinsic semiconductors.	CO6	L2	2M
	j	What are the applications of Hall effect?	CO6	L1	2M

PART-B
(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

2	a	Describe the formation of Newton's ring with necessary theory with relevant diagrams.	CO1	L3	6M
	b	Explain how the wavelength of light sources is determined using Newton's rings.	CO1	L2	4M

OR

3	a	Explain the Polarization by reflection with neat sketch.	CO1	L2	5M
	b	Illustrate the Double refraction in crystal.	CO1	L4	5M

UNIT-II

4	a	Explain the various types of Bravais lattices with a neat sketch.	CO2	L2	4M
	b	Define atomic packing fraction and derive it for simple cubic crystal structure.	CO2	L3	6M

OR

5	a	Explain how crystal structure determined by Laue X-Ray diffraction method.	CO2	L2	7M
	b	What are the advantages of Laue X-Ray diffraction method?	CO2	L1	3M

UNIT-III

6	a	Discuss the frequency dependence of various polarization processes in dielectric materials.	CO3	L2	7M
	b	Write the causes for Dielectric loss.	CO3	L4	3M

OR

7	a	Explain hysteresis of ferromagnetic material.	CO4	L2	5M
	b	Distinguish between soft and hard magnetic materials.	CO4	L2	5M

UNIT-IV

8	a	Derive Schrödinger's time independent wave equation.	CO5	L3	7M
	b	Explain the physical significance of wave function.	CO5	L2	3M

OR

9	a	Write brief note on Fermi Dirac distribution. What is the effect of temperature on Fermi Dirac distribution function?	CO5	L1	7M
	b	Find the probability at which there is 1% probability that a state with energy 0.5 eV is above Fermi energy.	CO5	L3	3M

UNIT-V

10	a	Derive the expression for the conductivity of intrinsic semiconductor .	CO6	L3	7M
	b	The following data are given for an intrinsic Ge at 300K. Calculate the conductivity of the sample? ($n_i = 2.4 \times 10^{19} m^{-3}$, $\mu_e = 0.39\ m^2\text{-}V^{-1}S^{-1}$, $\mu_p = 0.19\ m^2\text{-}V^{-1}S^{-1}$)	CO6	L3	3M
		OR			
11	a	Derive the expression for current generated due to drifting of charge carriers in semiconductors in the presence of electric field.	CO6	L3	5M
	b	Derive the expression for current generated due to diffusion of charge carriers in semiconductors in the absence of electric field.	CO6	L3	5M

***** END *****

O.P.Code: 23CE0101	R23	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech I Year II Semester Regular Examinations July-2024

BASIC CIVIL & MECHANICAL ENGINEERING
(Common to CSE, CSIT, EEE & ECE)

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

Time: 3 Hours **Max. Marks: 70**

PART-A (CIVIL)

(Answer all the Questions **5 x 1 = 10** Marks)

1	a	What is meant by surveying?	CO1	L1	1M
	b	List out various sources of water?	CO1	L1	1M
	c	Define Benchmark.	CO2	L2	1M
	d	State the functions of Air Transport.	CO3	L1	1M
	e	How impurities in water are classified?	CO3	L2	1M

(Answer all Three Units 3 x 10 = 30 Marks) (CIVIL)

UNIT-I

2	a	Describe about Hydraulic Engineering.	CO1	L2	5M
	b	Explain in detail about Irrigation & Water Resource Engineering.	CO1	L2	5M
		OR			
3	a	Explain the classification, qualities and constituents of a brick.	CO1	L2	5M
	b	List out various uses of bricks in construction.	CO1	L1	5M

UNIT-II

4	a	Define surveying. Mention the objectives of surveying	CO2	L2	5M
	b	What are the uses of surveying?	CO2	L1	5M
		OR			
5		Briefly explain the various methods of horizontal measurement.	CO2	L2	10M

UNIT-III

6	a	What are the purposes for constructing a dam?	CO3	L1	5M
	b	Explain briefly about how dams are classified according to material use.	CO3	L2	5M
		OR			
7		What are the various sources of water used in water supply schemes?	CO3	L1	10M

PART-B(MECHANICAL)

(Answer all the Questions **5 x 1 = 5** Marks)

1	f	Define Strength of a material.	CO1	L1	1M
	g	What are smart materials.	CO1	L1	1M
	h	How do you classify the heat engines?	CO2	L1	1M
	i	What is Hybrid Electric vehicle?	CO2	L1	1M
	j	Define the nuclear fission process.	CO3	L1	1M

(Answer all Three Units 3 x 10 = 30 Marks) (MECHANICAL)

UNIT-IV

8	a	List out various properties of the metals.	CO1	L1	5M
	b	Distinguish between ferrous and Nonferrous materials.	CO1	L4	5M
		OR			
9		Name the types of smart materials and explain them.	CO1	L2	10M

UNIT-V

10		Explain the working principle of casting with a neat sketch. And also mention its applications.	CO2	L2	10M
		OR			
11	a	Illustrate the functions of Additive manufacturing.	CO2	L2	5M
	b	Differentiate between traditional Manufacturing and smart manufacturing	CO2	L2	5M

UNIT-VI

12		Draw the layout of Diesel power plant and explain.	CO3	L2	10M
		OR			
13	a	Differentiate between Belt drives, chain drives and gear drives.	CO3	L2	5M
	b	What is the need of Robots in Industry?	CO3	L1	5M

***** END *****

O.P.Code: 23ME0302(b)	R23	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B Tech I Year II Semester Regular Examinations July-2024

ENGINEERING GRAPHICS

(Common to CE, ME, CSM & CCC)

Time: 3 Hours **Max. Marks: 70**

(Answer all the Questions **5 x 14 = 70** Marks)

UNIT-I

1	a	Draw the involute of a regular pentagon of side 20 mm	CO1	L3	7M
	b	Develop the involute of a circle of side diameter 50 mm. Draw a tangent and normal to the curve at a distance of 100 mm from the centre of the circle.	CO1	L3	7M

OR

2	a	Construct a scale of 1: 8 show decimeters and centimeters and to read upto 1m.Show a length of 7.6 dm on it.	CO1	L6	7M
	b	Construct a diagonal scale of S.F=1/(2.5 x 106) to read upto a single kilometer and long enough to measure 400 km. Mark a length of 254 km on it.	CO1	L6	7M

UNIT-II

3		Draw the projections of a straight line AB of 70 mm long, in the following positions: a) parallel to both HP and VP and 20 mm from each. b) Parallel to and 20 mm above the HP and on VP c) Parallel to and 30 mm in front of VP and on HP d) Perpendicular to HP, 30mm in front of VP & one end 25mm above HP e) Perpendicular to HP, 30 mm in front of VP & one end on HP	CO2	L1	14M

OR

4		A regular hexagonal plane of 30 mm side has a corner on HP, and its surface is inclined at 450 to HP. Draw the projections, when the diagonal through the corner, which is on HP makes 300 with VP.	CO3	L6	14M

UNIT-III

5		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	14M

OR

6		A cylinder of base diameter 50mm and axis 70 mm has a generator in the VP and inclined at 45o to the HP. Draw its projections	CO3	L6	14M

UNIT-IV

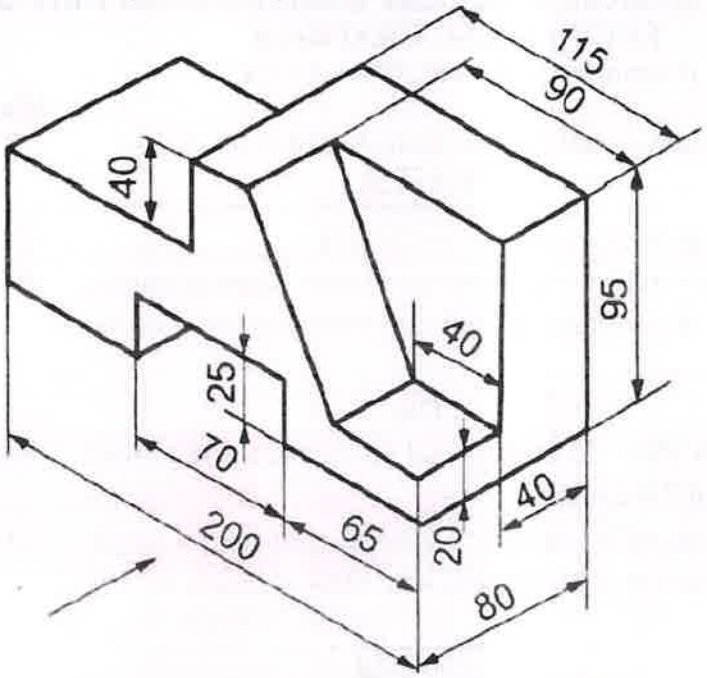
7		A cube of side 40 mm is resting on HP on one of its faces, with a vertical face inclined at 300 to VP. It is cut by a section plane inclined at 450 to HP and passing through the axis at 8 mm from the top surface. Draw the projections of the solid and also show the true shape of the section.	CO4	L6	14M

OR

8		A pentagonal pyramid with edge of base 25 mm and axis 65 mm long, its base is resting on HP. It is cut by a section plane, inclined at 600 to HP and perpendicular to VP it bisects the axis. Draw the projections and obtain the true shape of the section.	CO4	L6	14M

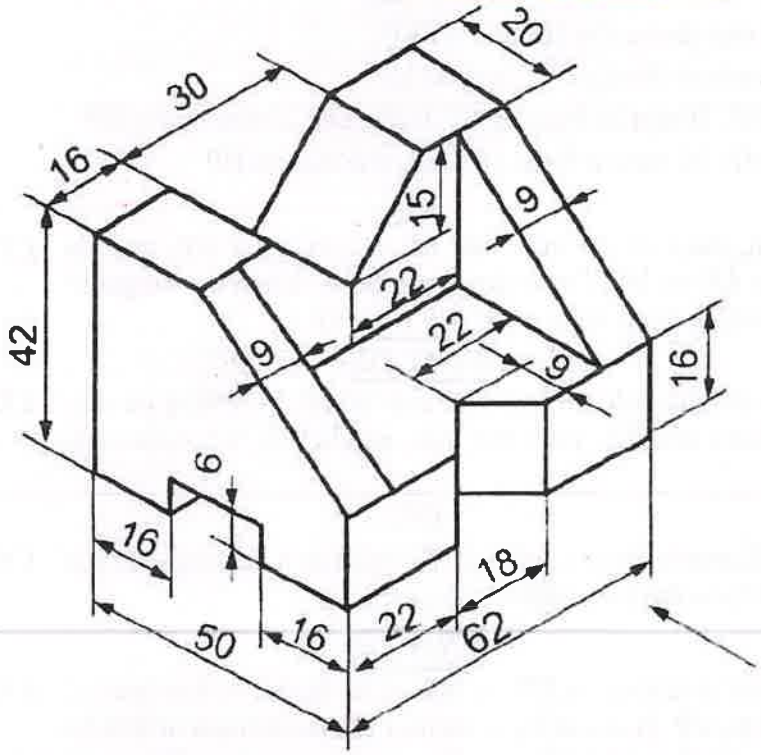
UNIT-V

9	Draw three views of the blocks shown pictorially in figure according to first angle projection.	CO6	L6	14M



OR

10	Draw three views of the blocks shown pictorially in figure according to first angle projection.	CO6	L6	14M



*** END ***

O.P.Code: 23EE0201(b)	R23	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech I Year II Semester Regular Examinations July-2024

BASIC ELECTRICAL & ELECTRONICS ENGINEERING
(Common to CAD, CIC & CAI)

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

Time: 3 Hours **Max. Marks: 70**

PART-A (ELECTRICAL)

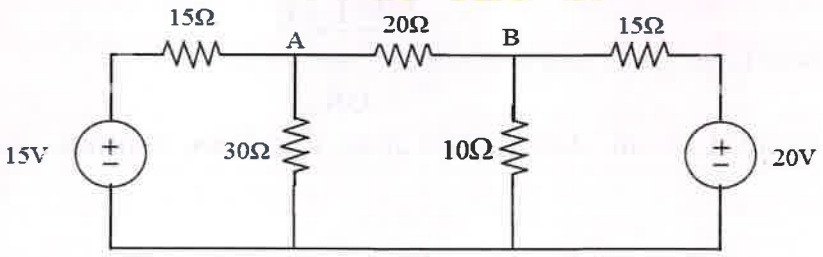
(Answer all the Questions 5 x 1 = 5 Marks)

1	a	State ohm's law.	CO1	L1	1M
	b	What are the passive elements?	CO1	L1	1M
	c	Write any three applications of a DC Motor.	CO2	L1	1M
	d	Which instrument is used to measure the DC quantity?	CO2	L1	1M
	e	What are the Conventional Energy sources?	CO3	L1	1M

(Answer all Three Units 3 x 10 = 30 Marks) (ELECTRICAL)

UNIT-I

2	a	State and explain Kirchhoff's laws?	CO2	L2	5M
	b	Determine the current in branch A-B by using KVL	CO2	L3	5M



OR

3	a	Define the following terms (i)Impedance, ii)Active power, iii) Reactive power	CO3	L1	5M
	b	Find the average value and RMS values of a Sinusoidal wave.	CO3	L4	5M

UNIT-II

4		Explain the Working principle of single phase transformer	CO1	L2	10M

OR

5		Explain construction and operating principle of Permanent Magnet Moving Coil (PMMC) instruments.	CO2	L2	10M

UNIT-III

6		Explain the Layout and operation of Hydel power generating station	CO3	L2	10M

OR

7	a	What are the functions of electric fuse?	CO4	L1	5M
	b	What is an electric shock? How to prevent electric shock at home?	CO4	L1	5M

PART-B(ELECTRONICS)

(Answer all the Questions **5 x 1 = 5** Marks)

1	f	What are conductors?	CO1	L1	1M
	g	Define biasing.	CO1	L1	1M
	h	Define amplifier.	CO2	L1	1M
	i	What are the basic properties of Boolean algebra?	CO4	L1	1M
	j	What is hamming code?	CO3	L1	1M

(Answer all Three Units 3 x 10 = 30 Marks) (ELECTRONICS)

UNIT-IV

8	Explain the operation of pn junction diode under forward bias and reverse bias conditions with the help of V-I characteristics curve.	CO5	L1	10M

OR

9	what are the three transistor configuration ? compare the characteristics of three configuration.	CO2	L4	10M

UNIT-V

10	Explain the working of a full wave bridge rectifier with a neat diagram with wave forms.	CO2	L1	10M

OR

11	Draw the block diagram of Public Addressing System and explain the function of each block.	CO2	L3	10M

UNIT-VI

12	Explain about Logic gates with symbols and truth table.	CO3	L1	10M

OR

13	Define sequential circuit. And explain about Flip flops, registers, and counters.	CO3	L4	10M

***** END *****

O.P.Code:23EE0205	R23	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech. I Year II Semester Regular Examinations July-2024

NETWORK ANALYSIS
(Electronics & Communications Engineering)

Time: 3 Hours **Max. Marks: 70**

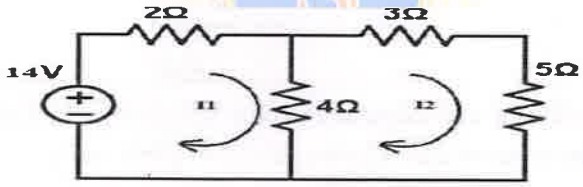
PART-A
(Answer all the Questions **10 x 2 = 20** Marks)

1	a	Define statement of Milliman's theorem.	CO1	L1	2M
	b	Define statement of Thevenin's theorem.	CO1	L1	2M
	c	Define time constant.	CO2	L1	2M
	d	State Final value theorem.	CO2	L1	2M
	e	Draw equivalent circuit of a pure inductor connected to a sinusoidal supply in frequency domain.	CO3	L2	2M
	f	Explain j operator.	CO3	L1	2M
	g	Define Self-inductance.	CO4	L1	2M
	h	Define Bandwidth.	CO4	L1	2M
	i	Draw the equivalent circuit of Z-parameters.	CO5	L1	2M
	j	What is the condition for Reciprocity in Z and Y parameters?	CO5	L1	2M

PART-B
(Answer all Five Units 5 x 10 = 50 Marks)

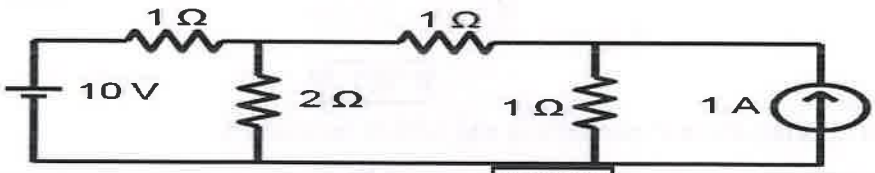
UNIT-I

2		Calculate the voltage & current within all the resistors by using Substitution theorem.	CO1	L3	10M



OR

3		Calculate the current in 2Ω resistor in the given circuit using Super position theorem.	CO1	L3	10M



UNIT-II

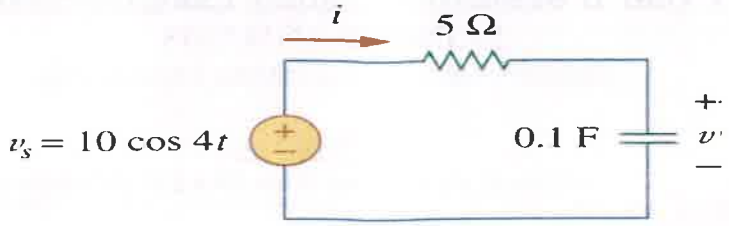
4	a	Derive the transient response of R-L series circuit having DC excitation.	CO2	L2	5M
	b	The constant voltage of 100 V is applied at t = 0 to a series R–C circuit having R = 5MΩ, C = 20μF. By assuming no initial charge to the capacitor, find current i and the voltage across R and C.	CO2	L3	5M

OR

5	a	Derive the expression for current in R-C series circuit having DC excitation.	CO2	L2	5M
	b	A coil having a resistance of 100Ω and an inductance of 20 H is connected to a 200 V DC source. Suddenly, the coil is disconnected from the battery and short-circuited. Calculate the following: i). The current in the coil at t = 0 ii). Rate of change of current at t = 0 iii). Time constant	CO2	L3	5M

UNIT-III

6	a	Explain phasor representation of series R L circuit.	CO3	L2	5M
	b	Find $v(t) and\ i(t)$ in the circuit shown in figure below	CO3	L3	5M

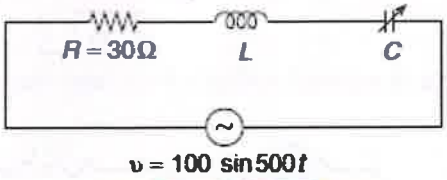


OR

7	a	Explain the phasor relation for R, L, C elements.	CO3	L1	6M
	b	A voltage of 120 V at 50 Hz is applied to a resistance, R in series with a capacitance, C. The current drawn is 2 A, and the power loss in the resistance is 100 W. Calculate the resistance and the capacitance.	CO3	L3	4M

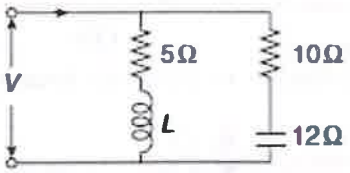
UNIT-IV

8	a	Derive an equation for the Q-factor of a series resonant circuit in terms of R, L and C.	CO4	L2	5M
	b	In the R–L–C series circuit shown in Figure, resonance occurs when the value of C is 20μF. The supply voltage is v = 20 sin 500 t. Find the values of L and Q-factor.	CO4	L3	5M



OR

9		Calculate the value of the inductance L for which the parallel circuit shown in Figure will be in resonance at a frequency of 2000 rad/s.	CO4	L3	10M



UNIT-V

10		Explain in detail about Z-parameters and ABCD parameters.	CO5	L2	10M

OR

11		Explain what is the effect overall Transmission parameters when two or more two- port networks are connected in cascade.	CO5	L2	10M

***** END *****

O.P.Code: 23CE0102	R23	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech. I Year II Semester Regular Examinations July-2024

ENGINEERING MECHANICS
(Common to CE & ME)

Time: 3 Hours **Max. Marks: 70**

PART-A
(Answer all the Questions **10 x 2 = 20** Marks)

1	a	List different system of Coplanar forces and give example for each.	CO1	L1	2M
	b	Explain cone of friction.	CO1	L2	2M
	c	State and explain Triangle Law of forces.	CO2	L1	2M
	d	State converse of the Law of Polygon of Forces.	CO2	L1	2M
	e	List when the product of inertia will be zero for an area.	CO3	L2	2M
	f	Define the terms moment of inertia and radius of gyration.	CO3	L1	2M
	g	Explain the terms *Rectilinear* and *Curvilinear* motion.	CO5	L2	2M
	h	What is *Impulse*? Write *Impulse Momentum* equation.	CO5	L1	2M
	i	A pulley 2 m in diameter is keyed to a shaft which makes 240 rpm. Find the linear velocity of a particle on the periphery of the pulley.	CO6	L3	2M
	j	Explain plane motion with an example.	CO6	L2	2M

PART-B
(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

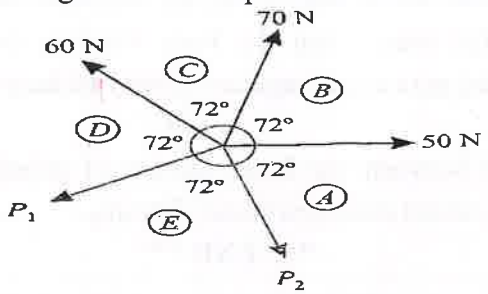
2	The following forces act at a point: (i) 20 N inclined at 30° towards North of East (ii) 25 N towards North (iii) 30 N towards North West, and (iv) 35 N towards at 40° towards South of West. Find the magnitude and direction of the resultant force.	CO1	L3	10M

OR

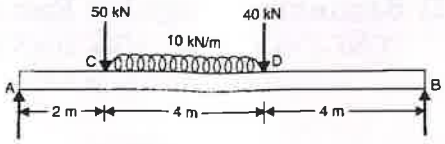
3	A 200 N force passes through points A (10, 25, -35) and B (-20, 20, 10) and is directed from A to B. Determine the Cartesian component of the force.	CO1	L3	10M

UNIT-II

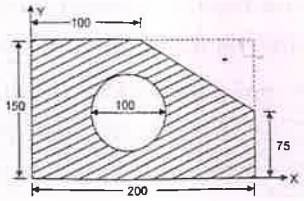
4	Five strings are tied at a point and are pulled in all directions, equally spaced from one another as shown in Figure below. If the magnitude of the pulls on threeconsecutive strings is 50 N, 70 N and 60 N respectively, find graphically themagnitude of the pulls on two other strings.	CO2	L3	10M



OR

5	A simply supported beam of length 10 m, carries the uniformly distributed load and two point loads as shown in Figure below. calculate the support reactions. 	CO2	L3	10M

UNIT-III

6	Determine the coordinates x_c and y_c of the centre of a 100 mm diameter circular hole cut in a thin plate so that this point will be the centroid of the remaining shaded area shown in Figure below. All dimensions are in mm. 	CO3	L3	10 M

OR

7	Determine the moment of inertia of a solid sphere of radius R about itsdiametral axis.	CO4	L3	10M

UNIT-IV

8	A projectile is aimed at a mark on the horizontal plane through the point of projection and falls 12 m short when the angle of projection is 15^o, while it overshoots the mark by 24 m when the same angle is 45^o. Find the angle of projection to the mark. Assume no air resistance. Take the velocity of projection constant in all cases.	CO5	L1	10M

OR

9	A stone is thrown vertically upwards with a velocity of 19.6 m/s from the topof tower 24.5 m high. Calculate: (i) time required for the stone to reach the ground (ii) velocity of the stone in its downward travel at the point in the same level as the point of projection. (iii) the maximum height to which the stone will rise in its flight.	CO5	L4	10M

UNIT-V

10	The equation for angular displacement of a body, moving in a circular path ofradius 200 m is given by $\theta = 18t + 3t^2-2t^3$ where θ is the angular displacement at the end of t sec. Find (i) angular velocity and acceleration at start, (ii) time when the body reaches its maximum angular velocity; and (iii) maximum angular velocity of the particle.	CO6	L2	10M

OR

11	Derive the relationship between the linear motion of geometric centre andangular motion of a wheel rolling without slipping.	CO6	L2	10M

***** END *****

Q.P.Code: 23CS0504	R23	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech. I Year II Semester Regular Examinations July-2024

DATA STRUCTURES

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

Time: 3 Hours **Max. Marks: 70**

PART-A

(Answer all the Questions **10 x 2 = 20** Marks)

1	a	What is the need of data structures?	CO1	L2	2M
	b	Define ADT (Abstract Data Type).	CO1	L1	2M
	c	What are the ways of implementing linked list?	CO2	L1	2M
	d	How the doubly linked list can be represented?	CO2	L2	2M
	e	Give one example of a problem where backtracking algorithms are used.	CO3	L2	2M
	f	What are the various Operations performed on the Stack?	CO3	L1	2M
	g	What are the different types of queues?	CO4	L1	2M
	h	Define priority queue.	CO4	L1	2M
	i	Define trees in data structure	CO5	L1	2M
	j	What is Binary search tree?	CO5	L1	2M

PART-B

(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

2	a	What do you mean by Searching? Explain sequential search.	CO1	L3	5M
	b	Explain about binary search.	CO1	L2	5M

OR

3	a	Sort the following numbers using Bubble sort : 14,33,27,35,10.	CO1	L4	5M
	b	Explain insertion sort with an example.	CO1	L3	5M

UNIT-II

4	a	Explain the operations of singly linked lists.	CO2	L3	5M
	b	What are the advantages of linked list?	CO2	L2	5M

OR

5	a	Explain the operations of doubly linked lists	CO2	L1	5M
	b	Explain the operations of circularly linked lists.	CO2	L4	5M

UNIT-III

6	a	Write an algorithm for converting an Infix to Postfix notation using stack.	CO3	L1	5M
	b	Convert the following Infix into Postfix expression: A+(B*C)/D.	CO3	L4	5M

OR

7	a	What do you mean by stack overflow and stack underflow?	CO3	L4	6M
	b	List and explain the applications of stack.	CO3	L3	4M

UNIT-IV

8	a	Describe the properties of queues.	CO4	L2	6M
	b	Illustrate the operations on queues.	CO4	L2	4M

OR

9	a	Explain about scheduling	CO4	L2	5M
	b	Discuss about Deques.	CO4	L2	5M

UNIT-V

10	a	Explain the Representation of Trees in data structure	CO5	L2	5M
	b	Write the deletion operation of Binary search tree and delete the node 55 in the above created Tree.	CO5	L3	5M

OR

11	a	Create a C program for traversing BST.	CO5	L6	5M
	b	Create a Binary search Tree for the following values 45, 15, 79, 90, 10, 55, 12, 20, 50 and perform Binary search Tree (BST) Traversals.	CO5	L6	5M

***** END *****

O.P.Code:23EE0203	R23	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech. I Year II Semester Regular Examinations July-2024
ELECTRICAL CIRCUIT ANALYSIS - I
(Electrical & Electronics Engineering)

Time: 3 Hours **Max. Marks: 70**

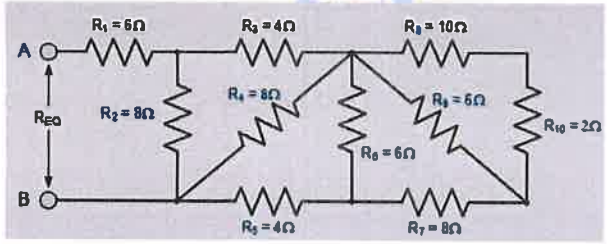
PART-A
(Answer all the Questions **10 x 2 = 20** Marks)

1	a	Define branch, node, mesh or loop.	CO1	L2	2M
	b	Define potential difference.	CO1	L1	2M
	c	State dot rule for coupled coils.	CO2	L2	2M
	d	Define self inductance.	CO2	L1	2M
	e	Determine the power factor of RLC series circuit with R=5Ω, X_L=8Ω and X_C=12 Ω.	CO3	L2	2M
	f	Write the impedance equation for series RL, RC, RLC and parallel RL, RC, RLC.	CO3	L1	2M
	g	What is the resonance frequency in a series RLC Circuit.	CO4	L1	2M
	h	Draw the frequency response of series and parallel RLC circuits.	CO4	L2	2M
	i	Draw the equivalent circuit of Norton's Theorem and Thevenin's theorem.	CO5	L1	2M
	j	State superposition theorem.	CO5	L2	2M

PART-B
(Answer all Five Units 5 x 10 = 50 Marks)

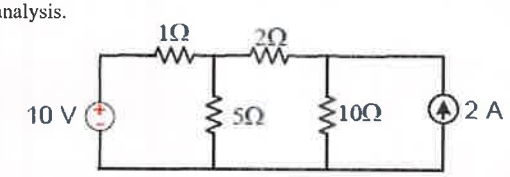
UNIT-I

2		Find the equivalent resistance, REQ for the following resistor combination circuit.	CO1	L3	10M



OR

3	a	Explain about Source transformation technique.	CO1	L2	5M
	b	Determine all branch currents and the voltage across the 5 Ω resistor by node analysis.	CO1	L3	5M



UNIT-II

4	a	Define Magneto Motive Force (MMF), Magnetic Flux density, and Reluctance.	CO2	L2	5M
	b	Derive an expression for composite magnetic circuits.	CO2	L3	5M

OR

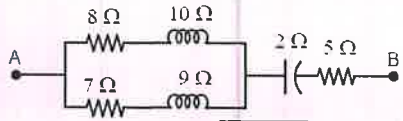
5	a	Explain the concept of Series and Parallel Magnetic Circuits.	CO2	L2	5M
	b	A coil having an inductance of 100mH is magnetically coupled to another coil having an inductance of 900mH. The coefficient of coupling between the coils is 0.45. calculate the equivalent inductance if the two coils are connected in (i) series aiding, (ii) series opposing, (iii) parallel aiding, and (iv) parallel opposing.	CO2	L3	5M

UNIT-III

6		Determine the steady-state analysis for the response of a pure resistor, a pure inductor, and a pure capacitor to the sinusoidal excitations and derive the average power equations.	CO3	L2	10M

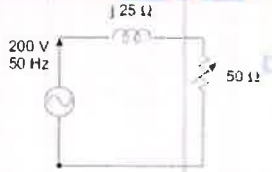
OR

7	a	Determine the series RLC circuit excited by a sinusoidal source	CO4	L4	5M
	b	In the arrangement shown in the figure. Calculate the impedance between AB and the phase angle between voltage and current. Also calculate the total power consumed, if the applied voltage between AB is 200∠30°.	CO4	L3	5M



UNIT-IV

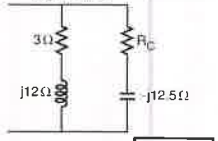
8	a	For the circuit shown in Figure. plot the locus of the current, mark the range of I for maximum and minimum values of R, and the maximum power consumed in the circuit. Assume X_L=25 Ω and R=50 Ω. The voltage is 200 V; 50 Hz.	CO6	L3	5M



	b	Obtain an expression for resonant frequency in a parallel resonant circuit.	CO6	L2	5M

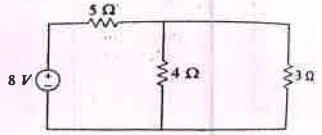
OR

9		In the RLC network shown in figure, determine the value of RC for resonance. Also calculate the dynamic resistance.	CO6	L3	10M



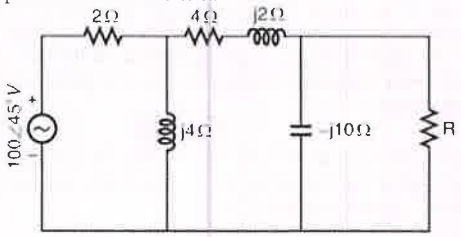
UNIT-V

10		In the circuit shown, the 3Ω resistance is changed to 6Ω resistance. Using the compensation theorem find the change in current in 5Ω resistance.	CO5	L2	10M



OR

11 Determine the AC excited circuit shown for the value of R so that the maximum power is transferred to it. **CO5 L3 10M**



*** END ***

O.P.Code: 23HS0831 | R23 | H.T.No.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech I Year II Semester Regular Examinations July-2024
DIFFERENTIAL EQUATIONS & VECTOR CALCULUS
(Common to All)

Time: 3 Hours **Max. Marks: 70**

PART-A
(Answer all the Questions **10 x 2 = 20** Marks)

1	a	Find the Integrating Factor of $\frac{dy}{dx} + y = x$.	CO1	L3	2M
	b	Verify the exactness of the differential equation $2xydy - (x^2 - y^2 + 1)dx = 0$.	CO1	L4	2M
	c	Solve $\frac{d^2y}{dx^2} - a^2y = 0$.	CO2	L3	2M
	d	What is the formula of L-C-R Circuit with e.m.f?.	CO2	L1	2M
	e	Form the Partial differential equation by eliminating the arbitrary constants 'a' and 'b' from $z = ax + by + \left(\frac{a}{b}\right) - b$.	CO3	L6	2M
	f	Express the Lagrange's linear form of first order P.D.E.	CO4	L2	2M
	g	Find $div\,\vec{r}$ *where* $\vec{r} = x\vec{i} + y\vec{j} + z\vec{k}$.	CO5	L3	2M
	h	Define Irrotational Vector.	CO5	L1	2M
	i	Define Line integral.	CO6	L1	2M
	j	State Gauss's divergence theorem.	CO6	L1	2M

PART-B
(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

2	a	Solve $\frac{dy}{dx} + y.tanx = y^2\,secx$	CO1	L3	5M
	b	The temperature of a body drops from 100^0 C to 75^0 C in 10 minutes when the surrounding air is 20^0 C. What will be its temperature after half-an-hour? When will the temperature be 25^0 C ?	CO1	L3	5M

OR

3	a	Solve $x\frac{dy}{dx} + y = x^3y^6$	CO1	L3	5M
	b	Solve $x^2ydx-(x^3 + y^3)dy = 0$	CO1	L3	5M

UNIT-II

4	a	Solve $(D^2 - 4D)y = e^x + sin3x.cos2x$.	CO2	L3	5M
	b	Solve $(D^2 - 2D)y = e^x\,sin\,x$ by the method of variation of parameters.	CO2	L3	5M

OR

5	a	Solve $(D^2 - 3D + 2)y = xe^{3x} + sin2x$	CO2	L3	5M
	b	Solve $\frac{dx}{dt} = 3x + 2y : \frac{dy}{dt} + 5x + 3y = 0$.	CO2	L3	5M

UNIT-III

6	a	Form the Partial Differential Equation by eliminating the arbitrary functions from $xyz = f(x^2 + y^2 + z^2)$	CO3	L6	4M
	b	Solve $x(y - z)p + y(z - x)q = z(x - y)$	CO4	L3	6M

OR

7	a	Form the Partial Differential Equation by eliminating the constants from $2z = \frac{x^2}{a^2} + \frac{y^2}{b^2}$.	CO3	L6	4M
	b	**Solve** $\frac{\partial^2 z}{\partial x^2} + 4\frac{\partial^2 z}{\partial x \partial y} - 5\frac{\partial^2 z}{\partial y^2} = \sin(2x + 3y)$	CO4	L3	6M

UNIT-IV

8	a	Find the directional derivative of $xyz^2 + xz$ at (1,1,1) in the direction of normal to the surface $3xy^2 + y = z$ at (0,1,1) .	CO5	L3	5M
	b	Prove that $\boldsymbol{curl}(\emptyset\bar{f}) = (\boldsymbol{grad}\emptyset) \times \bar{f} + \emptyset(\boldsymbol{curl}\bar{f})$	CO5	L5	5M
		OR			
9	a	Evaluate the angle between the normal to the surface $xy = z^2$ at the points $(4,1,2) and\ (3,3,-3)$.	CO5	L5	5M
	b	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.	CO5	L3	5M

UNIT-V

10	a	If $\bar{F} = (x^2 + y^2)\vec{i} - (2xy)\vec{j}$. Evaluate $\int_c \bar{F}.d\bar{r}$ where 'C' is the rectangle in xy-plane bounded by $y = 0; y = b\ and\ x = 0; x = a.$	CO6	L5	5M
	b	If $F = (2x^2 - 3z)\vec{i} - 2xy\vec{j} - 4x\vec{k}$ then Evaluate $\int_v \nabla.\bar{F}\ dv$ where 'V' is closed region bounded by $x - 0; y - 0; z - 0\ and\ 2x + 2y + z - 4$.	CO6	L5	5M
		OR			
11		Using Gauss's divergence theorem, Evaluate $\iint_s x^3dydz + x^2ydzdx + x^2zdxdy$ where 's' is the closed surface consisting of the cylinder $x^2 + y^2 = a^2$ and the circular discs $z = 0; z = b$.	CO6	L3	10M

***** END *****