CODE: A10201	R23	H.T.No:									

RAVINDRA COLLEGE OF ENGINEERING FOR WOMEN

(AUTONOMOUS)

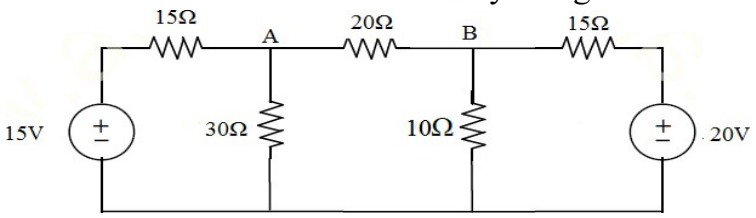
B.Tech I Year II Semester Supplementary Examinations December 2025

Subject Name: **Basic Electrical & Electronics Engineering**

Branch: CSE

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

Note: Part A must be answered from page no 3-18 and Part B must be answered from 19-36 pages

PART-A (Electrical Engineering Part) Answer all questions, each question carries one marks					
1	a	Define KVL.	1M	CO1	L1
	b	Define the terms form factor and peak factor of for Sine wave.	1M	CO2	L1
	c	List types of Alternators .	1M	CO2	L1
	d	When the Wheatstone bridge is balanced?	1M	CO3	L1
	e	Define electrical energy.	1M	CO3	L1
Answer all three units, 03 X 10 = 30 Marks					
UNIT-I					
2	a	State and explain superposition theorem.	5M	CO1	L2
	b	Determine the current in branch A-B by using KVL 	5M	CO1	L5
OR					
3	a	Define faradays laws of induction?	4M	CO5	L3
	b	Derive the RMS value for a sine waveform.	6M	CO2	L3
UNIT-II					
4	a	Explain the principle of operation of AC Generator with neat diagram	10M	CO2	L2
OR					
5	a	Explain construction and operating principle of PMMC type instruments.	10M	CO3	L2
UNIT-III					
6	a	Draw a neat schematic diagram of a Hydel Power plant and explain the function of various components.	10M	CO5	L4
OR					
7	a	Explain the working principle of miniature circuit breaker (MCB) with neat diagram.	5M	CO5	L2
	b	Define electrical energy? By taking various device connected in your house determine total energy meter reading in a month and calculate electricity bill for house.	5M	CO4	L2

PART-B (Electronics Engineering Part) Answer all questions, each question carries one marks					
8	a	Explain the significance of threshold voltage in forward characteristics of a n – p junction.	1M	CO1	L1
	b	Write the terminals of BJT.	1M	CO1	L1
	c	Draw the block diagram of dc power supply.	1M	CO1	L1
	d	Define peak inverse voltage (PIV).	1M	CO2	L1
	e	Derive the relation between alpha and beta of transistor.	1M	CO3	L1
Answer all three units, 03 X 10 = 30 Marks					
UNIT-I					
9	a	Draw the half wave rectifier and explain the operation with filter using neat diagrams	5M	CO4	L2
	b	Draw and explain the V-I characteristics of a PN diode.	5M	CO4	L2
OR					
10	a	With a neat diagram, explain the operation of an NPN transistor.	5M	CO4	L2
	b	Explain common emitter (CE) input characteristics	5M	CO4	L2
UNIT-II					
11	a	Explain Zener diode as voltage regulator with no load.	5M	CO4	L2
	b	Draw the block diagram of a public address system and explain its working.	5M	CO4	L2
OR					
12	a	Draw the diagram of an RC coupled CE amplifier and describe the role of the different capacitors.	5M	CO5	L2
	b	Define the term amplifier and explain the operation of public addressing system with neat block diagram.	5M	CO5	L2
UNIT-III					
13	a	Draw and explain the circuit diagram of a Full Adder using basic gates.	5M	CO5	L2
	b	Explain the Truth Tables and Boolean Expressions for NAND and NOR gates, showing their universal properties.	5M	CO6	L3
OR					
14	a	Explain along with truth tables of Half Adder and Full adder.	10M	CO6	L2

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CODE: A10009	R23	H.T.No									

RAVINDRA COLLEGE OF ENGINEERING FOR WOMEN

(AUTONOMOUS)

B.Tech I Year II Semester Supplementary Exams December – 2025

Subject Name: **Differential Equations & Vector Calculus**

Time: 3 Hours Branch: **Common for CSE and ECE** **Max. Marks: 70**

Instructions:

1. Answer all 10 questions from Part-A. Each question carries two marks
2. Answer one full question from each unit in Part-B. Each full question carries 10 marks

PART-A					
1	a	Define Bernoulli's differential Equation?	2M	CO1	L1
	b	State Newton's Law of cooling	2M	CO1	L1
	c	Obtain the particular integral of $(D^2+4D+9)y=e^{3x}$	2M	CO2	L2
	d	Solve particular of $(D^2+4)y = sin\,2\,x$	2M	CO2	L2
	e	Define order and degree of PDE	2M	CO3	L2
	f	Form the PDE by eliminating a&b from $z=ax+by+ab$	2M	CO3	L2
	g	Define solenoidal vector.	2M	CO4	L1
	h	Find div $\vec{f}$ for $\vec{f} = z\vec{\imath} + x\vec{\jmath} + y\vec{k}$.	2M	CO4	L1
	i	State Stoke's theorem.	2M	CO5	L1
	j	State Green's theorem of vector calculus.	2M	CO5	L1
PART-B					
UNIT-I					
2	a	Solve $\left(1+e^{\frac{x}{y}}\right)dx + e^{\frac{x}{y}}\left(1-\frac{x}{y}\right)dy = 0$	5M	CO1	L3
	b	Solve $(1+y^2)dx = (Tan^{-1}y - x)dy$	5M	CO1	L3
OR					
3	a	Solve $y^2dx + (x^2 - xy - y^2)dy = 0$	5M	CO1	L4
	b	Solve $x\frac{dy}{dx} + y = x^3y^6$	5M	CO1	L4
UNIT-II					
4	a	Solve $(D^3 + 2D^2 + D)y = e^{2x}$	5M	CO2	L3
	b	Solve $(D^2 - 4D + 3)y = Sin3x$	5M	CO2	L3
OR					
5		Solve the D.E $(D^2-4D+4)y=8x^2e^{2x}Sin2x$.	10 M	CO2	L3
UNIT-III					
6	a	Form the differential equation by elimination of arbitrary function from $\phi(x^2+y^2+z^2,xyz)=0$.	5M	CO3	L3
	b	Solve $x^2(y-z)p + y^2(z-x)q = z^2(x-y)$	5M	CO3	L3
OR					
7	A	Form PDE by eliminating arbitrary constants from $\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$	5M	CO3	L3
	B	Solve $x^2(y-z)p + y^2(z-x)q = z^2(x-y)$	5M	CO3	L3
UNIT-IV					
8	a	Determine the directional derivative of the function $f = xy + yz + zx$ in the direction of a vector $\vec{\imath} + 2\vec{\jmath} + 2\vec{k}$ at the point (1, 2 , 0)	5M	CO4	L3
	b	Determine curl $\bar{f}$, where $\bar{f} = grad\,(x^3 + y^3 + z^3 - 3xyz)$.	5M	CO4	L3
OR					
9		Show that $\nabla.(r^n\bar{r}) = (n+3)r^n$	10M	CO4	L3
UNIT-V					
10		Verify stokes theorem for $f = (x^2+y^2)i - 2xyj$ taken round the rectangle bounded by the lines $x = \pm a, y = 0, y = b$.	10M	CO5	L4
OR					
11		Apply Green's Theorem in the plane for $\int(2x^2 - y^2)dx + (x^2+y^2)dy$, where C is the boundary of the area enclosed by the X-axis and upper half of the circle $x^2 + y^2 = a^2$	10M	CO5	L4

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CODE: A10504 | **R23** | **H.T.No:**

RAVINDRA COLLEGE OF ENGINEERING FOR WOMEN

(AUTONOMOUS)

B.Tech I Year II Semester Supplementary Examinations December – 2025

Subject Name: DATA STRUCTURES

Branch: CSE

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

Instructions:

1. Answer all 10 questions from Part-A. Each question carries two marks
2. Answer one full question from each unit in Part-B. Each full question carries 10 marks

PART-A					
1	a	What is Data, Information and Data Structures? What are the objectives to study data structures?	2M	CO1	L1
	b	State the worst-case time complexity of bubble sort.	2M	CO1	L1
	c	What are the advantages of using linked lists over arrays?	2M	CO2	L1
	d	Mention one key difference between arrays and linked lists in terms of memory allocation.	2M	CO2	L2
	e	What is a stack? Mention its two main operations.	2M	CO3	L1
	f	How are stacks used in reversing a list?	2M	CO3	L2
	g	What is a queue? List two basic operations performed on a queue.	2M	CO4	L1
	h	What is the difference between input-restricted and output-restricted deques?	2M	CO4	L2
	i	List the three common types of tree traversal.	2M	CO5	L1
	j	Why tree is called abstract data type (ADT) data structures?	2M	CO6	L1
PART-B					
UNIT-I					
2	a	What is the difference between a linear and a non-linear data structure? Give examples.	5M	CO1	L4
	b	Explain the concept of Abstract Data Types (ADTs) with examples. How are ADTs implemented?	5M	CO1	L2
OR					
3	a	Differentiate between linear search and binary search in terms of their time complexity and working.	5M	CO1	L4
	b	Write an algorithm to sort an array of elements using Insertion sort.	5M	CO1	L2
UNIT-II					
4	a	What are the similarities and differences between doubly linked list and singly circular linked list?	5M	CO2	L4
	b	Describe the process of traversing a circular linked list.	5M	CO2	L2
OR					
5	a	List and explain any four applications of linked lists.	5M	CO2	L2
	b	Write an algorithm to delete a node from the beginning of a doubly linked list.	5M	CO2	L2
UNIT-III					

6	a	Implement a stack using a doubly linked list and explain how it handles insertion and deletion.	5M	CO3	L3
	b	Write the procedure to convert an infix expression to postfix using a stack.	5M	CO3	L2
OR					
7	a	Design an algorithm using stack to reverse a linked list.	5M	CO3	L2
	b	How do you handle overflow and underflow conditions in a stack implementation? Explain.	5M	CO3	L4
UNIT-IV					
8	a	Implement a queue using an array and discuss its limitations.	5M	CO4	L2
	b	Explain the application of deques in parsing algorithms.	5M	CO4	L3
OR					
9	a	Describe the application of deques in implementing stacks and queues.	5M	CO4	L2
	b	Write a program snippet to implement a queue using a singly linked list.	5M	CO4	L2
UNIT-V					
10	a	Given the following in order and post order traversal sequence reconstruct a binary tree: In order sequence: 4, 8, 2, 5, 1, 6, 3, 7 Pre-order sequence: 8, 4, 5, 2, 6, 7, 3, 1	5M	CO5	L3
	b	Explain the concept of collisions in hashing. Why do they occur even with a good hash function?	5M	CO6	L4
OR					
11	a	Explain open addressing and its types. Give examples.	5M	CO6	L2
	b	What is hash data structure? Consider the Keys (k) = {55, 48, 11, 62, 3, 33, 16} are inserted into an empty hash table using hash function H (k) = (k mod 7) and linear probing is used for collision resolution. Give content of the hash table after every key insertion.	5M	CO5	L6

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CODE: A10003	R23	H.T.No:									

RAVINDRA COLLEGE OF ENGINEERING FOR WOMEN

(AUTONOMOUS)

B.Tech I Year II Semester Supplementary Examinations December 2025

Subject Name: Engineering Physics

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

Instructions:

1. Answer all 10 questions from Part-A. Each question carries two marks
2. Answer one full question from each unit in Part-B. Each full question carries 10 marks

PART-A					
1	a	Explain constructive and destructive interferences.	2M	CO1	L1
	b	What is Super position principle?	2M	CO1	L1
	c	What effect does change the X-ray wave length have on the Bragg angle?	2M	CO2	L1
	d	What are the types of diffraction and give the differences between them?	2M	CO2	L1
	e	Define Dielectric constant.	2M	CO3	L1
	f	Derive the relation between B, H and M.	2M	CO3	L1
	g	Define Fermi level.	2M	CO4	L1
	h	What are the demerits of classical free electron theory?	2M	CO4	L1
	i	What is the process of doping?	2M	CO5	L1
	j	Define hall effect.	2M	CO5	L1
PART-B					
UNIT-I					
2	a	What are Newton's rings? Derive the expression for diameter of bright and dark rings	5M	CO1	**L3**
	b	A grating has 6000 lines/cm, find the angular separation between two wave lengths of 500 nm and 510 nm in the 3rd order.	5M	CO1	**L3**
OR					
3	a	Describe briefly how a diffraction pattern is obtained on a screen due to a single narrow slit illuminated by a monochromatic source of light.	6M	CO1	L2
	b	Find the minimum thickness of half wave plate and quarter wave plate for a light beam (λ=589.3nm) if μ_0 = 1.65833 and μ_e = 1.48640	4M	CO1	L4
UNIT-II					
4		Explain the Crystal structure determination by Laue's method and give its importance.	10M	CO2	**L2**
OR					
5	a	Describe Laue method for determination of crystal structure.	5M	**CO2**	BL3
	b	Lattice constant of copper is 0.38nm. Calculate the distance between (110) planes.	3M	CO2	**L2**
UNIT-III					
6		Explain the phenomenon of Ionic polarization and derive an expression for the Ionic polarizability.	10M	CO3	**L2**
OR					
7	a	Explain the hysteresis of ferromagnetic materials. How it can be used to select materials for construction of permanent magnets?	5M	CO3	**L2**

	b	An elemental dielectric has a relative dielectric constant of 12. It also contains 5 x 10^{28} atoms/m^3. Calculate its polarizability assuming Lorentz field.	5M	CO3	**L2**
UNIT-IV					
8	a	What are Matter waves? Explain their properties.	6M	CO4	**L2**
	b	Derive the expression for Debroglie wavelength.	4M	CO4	**L2**
OR					
9	a	Explain Fermi- Dirac distribution function along with its temperature dependence.	5M	CO4	**L2**
	b	How are solids classified on the basis of band theory of solids? Explain.	5M	CO4	**L4**
UNIT-V					
10	a	Obtain an expression for electrical conductivity of an intrinsic semiconductor.	6M	CO5	**L3**
	b	A current of 50A is established in a Cu slab (0.2cm thick and 2 cm wide).A magnetic field of 1.5T perpendicular to the plane of slab to the current is applied. Find the Hall voltage across the width of the slab.	4M	CO5	**L4**
OR					
11	a	Distinguish between Intrinsic Semiconductors and Extrinsic semiconductors.	5M	CO5	**L2**
	b	Define superconductivity and mention the properties of superconductors	5M	CO5	**L2**

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CODE: A10301	**R23**	**H.T.No:**									

RAVINDRA COLLEGE OF ENGINEERING FOR WOMEN

(AUTONOMOUS)

B. Tech I Year II Semester Supplementary Examinations Dec 2025

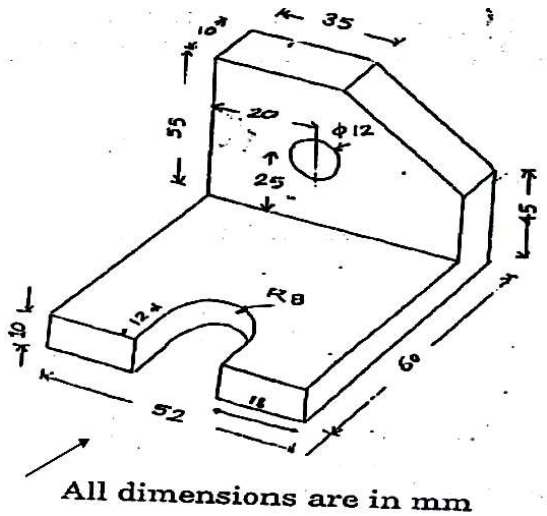
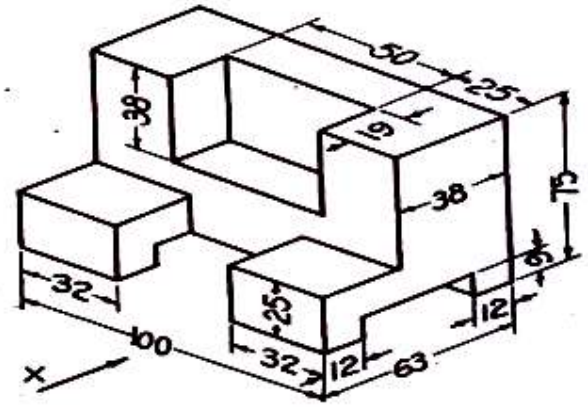
Subject Name: **Engineering Graphics**

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

Instructions:

1. Answer one full question from each unit. Each full question carries 14 marks

		UNIT-I			
1		A circle of 50 mm diameter rolls clockwise along a line for one revolution. Draw the locus of a point on the circle, which is in contact with the line. In addition, draw a tangent and a normal to the curve at a point 30 mm from the directing line.	14M	CO1	BTL2
		OR			
2		Construct a hyperbola, with distance of the focus from the directrix as 50mm and eccentricity as 3/2. Also draw normal and tangent to the curve at any point on the curve.	14M	CO1	BTL2
		UNIT-II			
3	A	A straight line AB of true length 100 mm has its end A 20 mm above HP and 30 mm in front of VP. The top view of the line is 80 mm and front view is 70 mm. Draw the projections (Top View and Front View) of the line AB and obtain the true inclinations of the line AB with HP and VP.	7M	CO2	BTL2
	B	A square lamina with a 50 mm side rests on the H.P., on one of its corners, such that the diagonal through that corner is parallel to the V.P. and inclined at 30° to the H.P. Draw its projections when the lamina is perpendicular to the V.P. Measure the distance of the topmost corner from the H.P.	7M	CO2	BTL2
		OR			
4		A rectangular plane of 60 mm X 40 mm is resting on shorter edge on the ground and inclined at 45^0 to V.P. The plane surface is inclined at 30^0 to H.P. Draw its projections.	14M	CO2	BTL2
		UNIT-III			
5		A square prism base 40 mm side and height 65 mm, has its axis inclined 45^0 to ground and has an edge of its base on the ground and inclined at 30^0 to the V.P. Draw its projections.	14M	CO3	BTL2
		OR			
6		Hexagonal pyramid side of base 25 mm and axis 50 mm long rests with one of the corners of its base on H.P. Its axis is inclined at 30^0 to H.P. and 45^0 to V.P. Draw its projections.	14M	CO3	BTL2
		UNIT-IV			
7		A triangular pyramid resting on HP with one of its base	14M	CO4	BTL2

		edge perpendicular to VP with a side of 42mm and axis length of 65mm. A section plane passing through the mid-point of the axis and parallel to HP. Draw the sectional Top View and Front View of the pyramid.			
		OR			
8		A cylinder of base diameter 50 mm and height 60 mm rests on its base on HP. It is cut by a plane perpendicular to VP and inclined at 45^0 to HP. The cutting plane meets the axis at a distance 15 mm from the top to the base. Draw the sectional plan and true shape of section.	14M	CO4	BTL2
		UNIT-V			
9		Draw the three views of the part shown in the figure below.  All dimensions are in mm	14M	CO5	BTL2
		OR			
10		Draw the front view, top view and right-side view of the object shown below (dimensions in mm).  	14M	CO5	BTL2

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