R23

I B.TECH II SEM

REGULAR & SUPPLEMENTARY

END EXAMINATION QUESTION PAPERS

MAY/JUNE 2025

NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

I B.Tech II Semester Regular & Supple. Examinations, May-2025 **R23**

Sub Code: R23CC1201 DIFFERENTIAL EQUATIONS & VECTOR CALCULUS

Time: 3 hours (Common to All Branches) Max. Marks: 70

Note: Question Paper consists of Two parts (Part-A and Part-B)

PART-A

Answering all the questions from Part-A is compulsory (10 x 2M = 20M)

Q.No		Questions	KL	CO	M
1	a	Find an integrating factor of $\frac{dy}{dx}=\frac{y}{x}+\frac{x^2+y^2}{x^2}$	K3	CO1	2M
	b	Consider the Bernoulli's equation $x\frac{dy}{dx}+y=y^2\log x$. Reduce this into a linear differential equation.	K3	CO1	2M
	c	Solve $y''-y'-2y=0$	K3	CO2	2M
	d	Find P.I of $(D^2+6D+5)y=e^{2x}$.	K3	CO2	2M
	e	Form the PDE by eliminating the arbitrary constants a and b from $z=ax+by+\frac{a}{b}-b$	K3	CO3	2M
	f	Solve $yzp+zxq=xy$	K3	CO3	2M
	g	Prove that $curl(grad\phi)=0$	K3	CO4	2M
	h	If $\bar{f}=(x+3y)\bar{i}+(y-2z)\bar{j}+(x+pz)\bar{k}$ is solenoidal. Find p	K3	CO4	2M
	i	Demonstrate Gauss Divergence Theorem.	K5	CO5	2M
	j	Find the work done by the force $\bar{f}=(2y+3)\bar{i}+(xz)\bar{j}+(yz-x)\bar{k}$ when it moves a particle from the point $(0,0,0)$ to $(2,1,1)$ along the curve $x=2t^2, y=t, z=t^3$	K5	CO5	2M

PART-B

Answer either 'a' or 'b' from each question of **PART-B** (5 x 10M = 50M)

Q.No		Questions	KL	CO	M
2		Unit-I			
	a	i) Solve $\left(1+e^{\frac{x}{y}}\right)dx+e^{\frac{x}{y}}\left(1-\frac{x}{y}\right)dy=0.$	K3	CO1	5M
		ii) Solve $x(x-1)\frac{dy}{dx}-y=x^2(x-1)^3.$	K3	CO1	5M
		OR			
	b	i) The temperature of the body drops from 100^0C to 75^0C in 10 minutes when the surrounding air is at 20^0C temperature. What will be its temperature after 30 minutes? when will the temperature to be 25^0C.	K3	CO1	5M
		ii) Solve $(1+y^2)+\left(x-e^{\tan^{-1}y}\right)\frac{dy}{dx}=0.$	K3	CO1	5M

		Unit-II			
3	a	i)Solve $(D^2+D)y=x^2+2x+4.$	K3	CO2	5M
		ii) Solve $(D^2-4D)y=e^x+\sin 3x\cos 2x.$	K3	CO2	5M
		OR			
	b	i) Solve $\frac{dx}{dt}-y=t$; $\frac{dy}{dt}+x=t^2$	K3	CO2	5M
		ii) Solve by the method of variation of parameter $(D^2+4)y=\sec 2x.$	K3	CO2	5M
		Unit-III			
4	a	i) Form a PDE by eliminating the arbitrary function $z=x+y+f(xy)$	K3	CO3	5M
		ii) Solve $(mz-ny)p+(nx-lz)q=ly-mx$	K3	CO3	5M
		OR			
	b	i) Solve $(y+z)p+(z+x)q=x+y.$	K3	CO3	5M
		ii) Form a PDE by eliminating the arbitrary constants a and b from $(x-a)^2+(y-b)^2=z^2\cot^2\alpha.$	K3	CO3	5M
		Unit-IV			
5	a	i) Find the angles between the surfaces $x^2+y^2+z^2=9$ and $z=x^2+y^2-3$ at the point $(2,-1,2)$	K3	CO4	5M
		ii) Find the directional derivative of xyz^2+xz at $(1,1,1)$ in a direction of the normal to the surface $3xy^2+y=z$ at $(0,1,1)$	K3	CO4	5M
		OR			
	b	i) Find $curl\ \bar{f}$ where $\bar{f}=grad(x^3+y^3+z^3-3xyz).$	K3	CO4	5M
		ii) Prove that $curl(\phi\bar{F})=grad\phi\times\bar{F}+\phi curl\bar{F}.$	K3	CO4	5M
		Unit-V			
6	a	i) Evaluate $\iint_S \bar{F}.\bar{n}\,ds,$ where $\bar{F}=4xz\bar{i}+y^2\bar{j}+yz\bar{k}$ and S is the surface of the bounded by $x=0,x=1,y=0,y=1,z=0,z=1.$	K5	CO5	5M
		ii) Verify Greens theorem for $\int_C\left[(xy+y^2)dx+x^2dy\right]$, where C is the region bounded by $y=x$ and $y=x^2$	K5	CO5	5M
		OR			
	b	i) Verify Gauss divergence theorem for $\vec{F}=(x^2-yz)\hat{i}+(y^2-zx)\hat{j}+(z^2-xy)\hat{k}$ and S be the surface of the rectangular parallelepiped by $x=0,x=1,y=0,y=1,z=0,z=1.$	K5	CO5	10M

NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

I B.Tech II Semester Regular & Supple. Examinations, May-2025

R23

Sub Code: R23CC1202 DATA STRUCTURES

Time: 3 hours (CSE,IT,AI,CS,DS,AIML,CSE(AIML)) Max. Marks: 70

Note: Question Paper consists of Two parts (Part-A and Part-B)

PART-A

Answering all the questions from Part-A is compulsory (10 x 2M = 20M)

Q.No		Questions	KL	CO	M
1	a	What is a Data Structure? List and briefly describe any four linear data structures.	K1	CO1	2M
	b	Is it possible to apply binary search on a singly linked list? Justify your answer with a proper explanation.	K2	CO2	2M
	c	Define a doubly linked list. How is a node represented in a doubly linked list?	K1	CO2	2M
	d	What are the advantages of linked lists over arrays? Explain with reasons.	K2	CO2	2M
	e	What are the applications of stack.	K2	CO3	2M
	f	What are the applications of deque.	K2	CO4	2M
	g	How is a node structured in a Binary Search Tree (BST) when represented using arrays? Illustrate with an example.	K2	CO5	2M
	h	Define in-order traversal in binary tree?	K2	CO5	2M
	i	Differntiate search and traversal on a graph	K2	CO5	2M
	j	What is the role of a hash function in hashing?	K2	CO6	2M

PART-B

Answer either 'a' or 'b' from each question of **PART-B** (5 x 10M = 50M)

Q.No		Questions	KL	CO	M
		Unit-I			
2	a	i) Apply the Insertion Sort algorithm to sort the following list of numbers: 45, 34, 12, 46, 27, 56, 11, 87, 6, 33. Show each iteration and explain how the sorted portion of the list grows.	K3	CO1	5M
		ii) Explain the algorithm for Binary Search. Apply the algorithm to search for the element 46 in the sorted array: [6, 11, 12, 27, 33, 34, 45, 46, 56, 87]. Show each step clearly.	K3	CO1	5M
		OR			
	b	i) Compare and analyze the time complexity of Bubble Sort and Quick Sort for large datasets. In which scenarios would one be preferred over the other, and why?	K4	CO1	10 M
		Unit-II			
3	a	i) Compare the performance of **linked lists and arrays** with respect to memory management, insertion, deletion, and traversal. Provide examples to support your analysis.	K4	CO2	5M
		ii) Write and explain the algorithm for **deletion of a node in a circular linked list.** Apply your algorithm to delete a specific node in a list of 5 elements and show each step.	K3	CO2	5M
		OR			
	b	i) Design and explain an algorithm to insert a node at the beginning, middle, and end of a **singly linked list.** Demonstrate with an example list.	K3	CO2	5M

		ii) Write and explain the algorithm for **deletion of a node in a circular linked list.** Apply your algorithm to delete a specific node in a list of 5 elements and show each step.	K3	CO2	5M
		Unit-III			
4	a	i) A stack is implemented using an array of size 5. If a series of push and pop operations are performed as follows: ***PUSH(10), PUSH(20), POP(), PUSH(30), PUSH(40), PUSH(50), PUSH(60), POP(), PUSH(70).*** Analyze the state of the stack at each step.	K3	CO3	5M
		ii) Convert the following complex infix expression to postfix using stack operations, show each step clearly and explain how the stack is used in the process: **A + (B * C - (D / E ^ F) * G) * H**	K4	CO4	5M
		OR			
	b	i) Analyze the behavior of **circular queue** implemented using an array. Given a queue of size 5, demonstrate how overflow and underflow conditions are handled when elements are enqueued and dequeued in a wrap-around scenario.	K3	CO3	5M
		ii) Compare and analyze the use of **deque** vs. **stack** in implementing undo-redo functionality in text editors. Which structure is more suitable and why?	K4	CO4	5M
		Unit-IV			
5	a	i) You are given the in-order traversal D, B, E, A, F, C, G and post-order traversal D, E, B, F, G, C, A of a binary tree. Construct the binary tree and explain the steps involved in your construction.	K3	CO5	5M
		ii) Construct a BST using the elements 50, 30, 20, 40, 70, 60, 80. Then delete node 30 and show the tree structure after deletion. Indicate whether the deleted node had zero, one, or two children, and how that affects the deletion process.	K3	CO5	5M
		OR			
	b	i) Given a **binary tree**, perform **in-order, pre-order, and post-order traversals** on the tree given and list the output sequences. A / \ B C /\ D E	K3	CO5	5M
		ii) Explain the insertion, deletion and traversal operations in a Binary Search Tree (BST).	K4	CO5	5M
		Unit-V			
6	a	i) Given the following undirected graph represented by an adjacency list, perform both **Breadth-First Search (BFS)** and **Depth-First Search (DFS)** starting from vertex 'A'. **Adjacency List:** A: B, C B: A, D, E C: A, F D: B E: B, F F: C, E	K3	CO5	5M
		ii) You are given an undirected graph with N vertices and E edges. Design an algorithm to detect whether the graph is connected using **Depth-First Search (DFS).** Briefly explain your approach and discuss how it would behave in a disconnected graph.	K4	CO6	5M
		OR			
	b	i) A hash table uses **modulo division hash function** h(k) = k % 7. Insert the keys 50, 700, 76, 85, 92, 73 into the hash table using: a) **Chaining,** b) **Linear Probing** Explain the process and show the final state of the table for both methods.	K3	CO6	5M
		ii) Compare and analyze **open addressing** and **chaining** as collision resolution techniques in hashing. Which method is more efficient in handling large datasets and why? Support your answer with examples and space-time trade-offs.	K3	CO5	5M

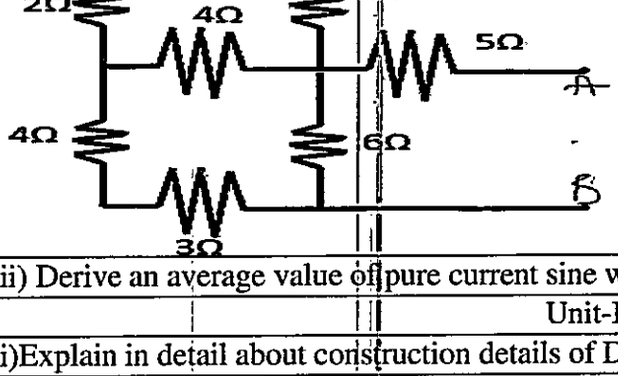
NEC NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

I B.Tech II Semester Regular & Supple. Examinations, May-2025 **R23**

Sub Code: R23CC1203 BASIC ELECTRICAL & ELECTRONICS ENGINEERING

Time: 3 hours (CSE,IT,AI) Max. Marks: 70

PART-A

Q.No		Questions	KL	CO	M
1	a	What is meant by electric circuit?	K1	1	1M
	b	List applications of induction motor.	K1	2	1M
	c	Define fuse.	K1	4	1M
	d	What is Indian standard A.C r.m.s voltage and frequency?	K1	1	1M
	e	List conventional energy resources.	K1	3	1M
2		Unit-I			
	a	i) Derive v-I relationship in passive elements.	K2	1	5M
		ii)Find inductive reactance and capacitive reactance of the following data : (a)f =50 HZ,L=0.2H ,C=5mF (b) w= 100 rad/sec,L=50mH ,C=0.4μF	K3	1	5M
		OR			
	b	i) Find total resistance of the circuit. 	K3	1	5M
		ii) Derive an average value of pure current sine wave.	K2	1	5M
3		Unit-II			
	a	i)Explain in detail about construction details of D.C machine	K2	2	5M
		ii) Explain about working principle of wheat stone bridge.	K2	2	5M
		OR			
	b	i) Explain working principle of three phase induction motor.	K3	2	5M
		ii) Explain in detail about construction details of PMMC.	K2	2	5M
4		Unit-III			
	a	i) Explain about hydel power plant with a layout.	K3	3	5M
		ii) what is an electric shock? List the safety precautions to avoid electric shock.	K2	4	5M
		OR			
	b	i) Explain about wind power generation with a layout.	K3	3	5M
		ii) Explain about working principle of MCB.	K2	4	5M

PART-B

Q.No		Questions	KL	CO	M
5	a	Draw a neat diagrams of PN diode and BJT's	K1	1	1M
	b	What is amplifier?	K1	2	1M
	c	Define flip flop.	K1	4	1M
	d	When will be zener diode acts as voltage regulator?	K1	2	1M
	e	What is meant by hamming code?	K1	3	1M
6		Unit-IV			
	a	i)Explain common base configuration and its characteristics	K2	1	5M
		ii) Explain about small signal in CE amplifier.	K3	2	5M
		OR			
	b	i)Explain in detail of PN diode characteristics	K2	1	5M
		ii) List the differences among CB, CC and CE configuration.	K3	2	5M
		Unit-V			
7	a	i) Explain about working of full wave bridge rectifier.	K2	2	5M
		ii)Explain an electronic instrument system with neat diagram	K3	2	5M
		OR			
	b	i)Explain in detail about RC coupled amplifier with its frequency response	K3	2	10M
		Unit-VI			
8	a	i) Draw a neat logic gates and truth tables of OR, AND, NOR, NAND, XOR and XNOR.	K2	3	5M
		ii) Explain about shift registers.	K2	4	5M
		OR			
	b	i) Explain about full adder.	K2	3	5M
		ii) Explain in detail about J-K flip flop.	K2	4	5M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

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NARASARAOPETA ENGINEERING COLLEGE
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I B.Tech II Semester Regular Examinations, May-2025

R23

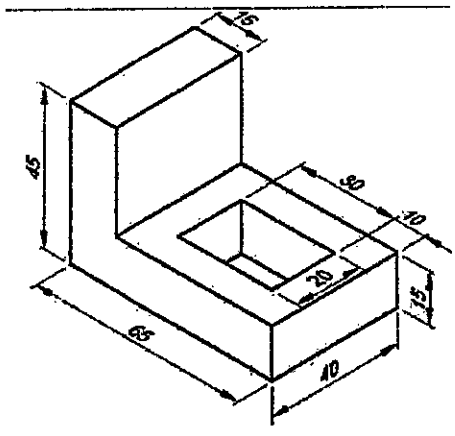
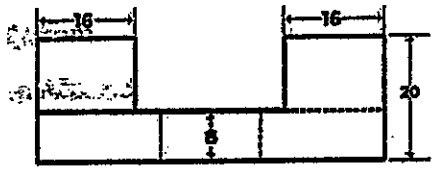
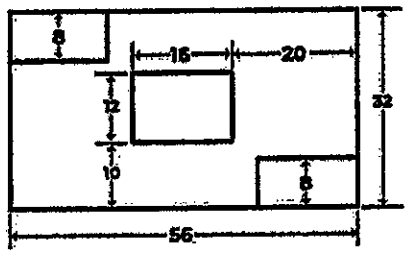
Sub Code: R23CC1204 ENGINEERING GRAPHICS

Time: 3 hours (CSE - A,B,C,D,E & F) Max. Marks: 70

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No		Questions	KL	CO	M
1		Unit-I			
	a	Draw a vernier scale of R.F. = 1/25 to read centimeters up to 4metres and on it, show lengths representing 2.38m and 0.91m.	L3	CO1	14M
		OR			
	b	Draw an involute of a circle of 50mm diameter. Also draw a normal and tangent to it at a point 120mm from the center of the circle	L3	CO1	14M
2		Unit-II			
	a	Line AB, 75mm long is inclined at 45^0 to the H.P. and 30^0 to the V.P. Its end B is in the H.P. and 40mm in front of the V.P. Draw its projections and determine its traces.	L3	CO2	14M
		OR			
	b	A thin rectangular plate of sides 60mmx30mm of 80mm has its shorter edge in the VP and inclined at 45^0 to HP. The surface of the plate makes an angle of 30^0 with the VP. Draw its projections.	L3	CO2	14M
3		Unit-III			
	a	Draw the projections of a cylinder 75mm diameter and 100mm long, lying on the ground with its axis inclined at 30^0 to the V.P. and parallel to the ground.	L3	CO3	14M
		OR			
	b	A square pyramid, base 40mm side and axis 65mm long, has its base in the V.P. One edge of the base is inclined at 30^0 to the H.P. and a corner contained by that edge is on the H.P. Draw its projections.	L3	CO3	14M
4		Unit-IV			
	a	A pentagonal pyramid of base side 25 mm and altitude 60 mm rests on its base on the HP with one of its edges of the base perpendicular to the VP. A cutting plane parallel to the HP cuts the pyramid at a height of 20 mm above the base. Draw the front view and the sectional top view.	L3	CO4	14M
		OR			
	b	A hexagonal prism of base side 30 mm and axis length 75 mm rests on the HP with two edges of its base perpendicular to the VP. It is cut by a plane perpendicular to the VP and inclined at 30° to the HP and meeting the axis	L3	CO4	14M

		at 25 mm from the top. Draw the development of the lateral surface of the retained portion.			
		Unit-V			
5	a	Draw the (i) Front view (ii) Top view and (iii) Side view for the following figures.  	L3	CO5	14M
		OR			
	b	Draw isometric view for the given orthographic projections.   	L3	CO5	14M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M:Marks

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NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

I B.Tech II Semester Regular & Supple. Examinations, May-2025

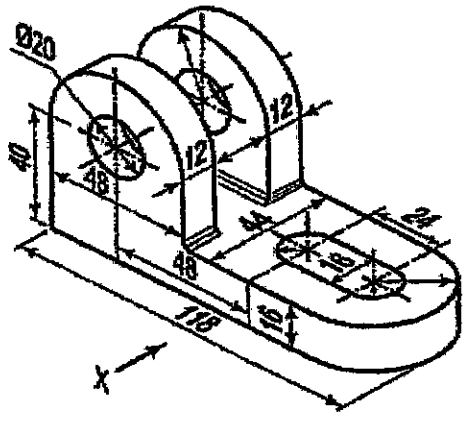
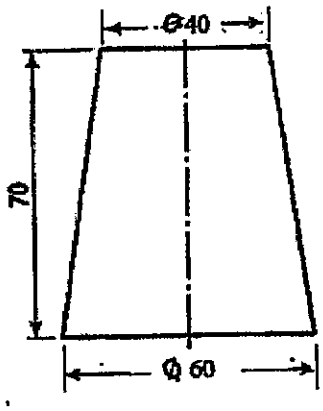
R23

Sub Code: R23CC1204 **ENGINEERING GRAPHICS**

Time: 3 hours (CSE- G, H, I ,J, IT & AI) Max. Marks: 70

Note: Answer All **FIVE** Questions.
All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No		Questions	KL	CO	M
1		Unit-I			
	a	(i) Draw a regular hexagon of side 50 mm. (ii) Draw a diagonal scale of R.F. = 3:100, showing meters, decimeters and centimeters, and to measure up to 5 meters. Show the length of 3.69 meters on it.	L2 L3	CO 1	(6+8) 14M
		OR			
	b	A circle of 50 mm diameter rolls along a straight line without slipping. Draw the curve traced out by a point P on the circumference, for one complete revolution of the circle. Name the curve. Draw a tangent to the curve at a point on it 40 mm from the line.	L3	CO 1	14M
2		Unit-II			
	a	A line 50 mm long, has its end A is in the H.P and 30 mm in front of the V.P. It is inclined at 30^0 to the H.P. and at 45^0 to the V.P. Draw its projections.	L3	CO 2	14M
		OR			
	b	Draw the projections of a regular hexagonal plane of 25 mm side, having one of its sides in the H.P. and inclined at 60° to the V.P., and its surface making an angle of 45° with the H.P.	L3	CO 2	14M
3		Unit-III			
	a	Draw the projections of a cylinder 75 mm diameter and 100 mm long, lying on the ground with its axis inclined at 30^0 to the V.P. and parallel to the ground.	L3	CO 3	14M
		OR			
	b	Draw the projections of a cone, base 75 mm diameter and axis 100 mm long, lying on the H.P. on one of its generators with the axis parallel to the V.P.	L3	CO 3	14M
4		Unit-IV			
	a	A cube of 35 mm long edges is resting on the H.P. on one of its faces with a vertical face inclined at 30° to the V.P. It is cut by a section plane, perpendicular to the V.P., inclined at 45° to the H.P. and passing through the top end of the axis. Draw its front view, sectional top view and true shape of the section.	L4	CO 4	14M

		OR			
	b	Draw the development of the lateral surface of a cylinder with 50mm diameter long 70mm axis on H.P.	L4	CO 4	14M
		Unit-V			
5	a	Draw the (i) Front view, (ii) Top view and (iii) Right side view of the machine block shown in figure-2.  Figure-2: Machine block	L4	CO 5	14M
		OR			
	b	The projection of the frustum of the cone is shown in figure-3. Draw its isometric view.  Figure – 3: Frustum of cone	L4	CO 5	14M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M:Marks

NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

I B.Tech II Semester Regular & Supple. Examinations, May-2025

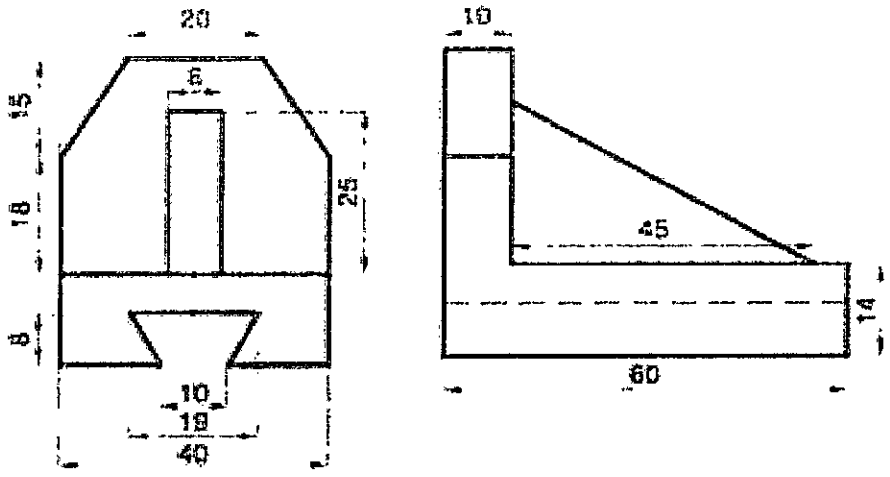
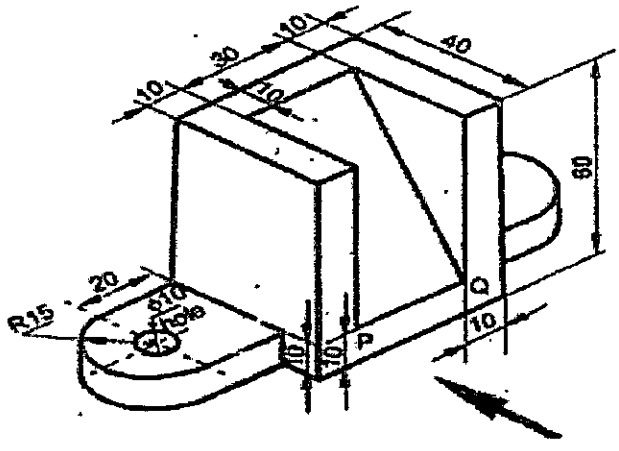
Sub Code: R23CC1204 **ENGINEERING GRAPHICS**

Time: 3 hours (IT & AI) Max. Marks: 70

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks (5 X 14 = 70M)

Q.No		Questions	KL	CO	M
1		Unit-I			
	a	A circle of 35mm diameter rolls on a horizontal line. Draw the curve traced out by a point R on the circumference for full revolution of the circle. Draw the tangent and normal at any point on the curve.	K3	1	14M
		OR			
	b	Construct a Diagonal scale of RF = 3:200 showing meters, decimeters and centimeters. The scale should measure up to 6 meters. Show a distance of 4.56 meters.	K3	1	14M
2		Unit-II			
	a	Draw the projections of the following points on the same ground line , keeping the distance between projectors equal to 25mm. i.Point A, 20mm above the HP, 25mm behind the VP ii.Point B, 25mm below the HP, 20mm behind the VP iii.Point C, 20mm below the HP, 30mm in front of the VP iv.Point D, 20mm above the HP, 25mm front of the VP	K3	2	14M
		OR			
	b	A line measuring 60 mm long has one of its end 40 mm above H.P and 30 mm in front of VP. The other end is 25 mm above HP and in front VP. The front view of the line is 55 mm long. Draw the top view.	K3	2	14M
3		Unit-III			
	a	A square plate with 35mm sides is inclined at 45^0 to the VP and perpendicular to the HP. Draw the projections of the plate if one of its corners is in the VP and the two sides containing that corner are equally inclined to the VP	K3	3	14M
		OR			
	b	A hexagonal plane surface of 25mm sides has one of its corners on the HP, with the surface inclined at 45^0 to the HP and the top view of the diagonal passing through that corner is perpendicular to the VP. Draw the projections of the plate.	K3	3	14M
4		Unit-IV			
	a	A square pyramid of base side 20 mm and altitude 50 mm rests on its base on the HP with two edges of the base perpendicular to the VP. A cutting plane parallel to the HP cuts the pyramid at a height of 20 mm above the base. Draw the front view and the sectional top view.	K3	4	14M
		OR			
	b	A pentagonal prism of base side 30 mm and axis length 75 mm rests on the HP on one of its ends with a rectangular face parallel to the VP. It is cut by a plane perpendicular to the VP and inclined at 30^0 to the HP and meeting the axis at 25 mm from the top. Draw the front view, sectional top view and the true shape of the section.	K3	4	14M

5		Unit-V			
	a	Fig.1 given below shows FV, TV and SV of an object. Draw the isometric view. 	K4	5	14M
		OR			
	b	Draw the front, top and left side view of the block shown in Fig.2. 	K4	5	14M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M:Marks

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NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

I B.Tech II Semester Regular & Supple. Examinations, May-2025

Sub Code: R23CC1205 **ENGINEERING PHYSICS**

Time: 3 hours (CSE,IT,AI) Max. Marks: 70

Note: Question Paper consists of Two parts (Part-A and Part-B)

PART-A

Answering all the questions from Part-A is compulsory (10 x 2M = 20M)

Q.No		Questions	KL	CO	M
1	a	Write down the characterstics of laser	K1	1	2M
	b	Explain the principle of propagation of light through optical fiber.	K2	1	2M
	c	Define space lattice and basis with example.	K1	2	2M
	d	Draw the atomic planes (100), (111), (123) and (234).	K2	2	2M
	e	How magnetic moments are created at an atomic level.	K1	3	2M
	f	Brief the properties of superconducting materials.	K1	3	2M
	g	Derive the expression for de Broglie wavelength of matter waves.	K2	4	2M
	h	Discuss the importance of Fermi energy.	K2	4	2M
	i	Classify the solids based on energy band theory.	K2	5	2M
	j	Mention few engineering applications of smart materials.	K1	5	2M

PART-B

Answer either 'a' or 'b' from each question of **PART-B** (5 x 10M = 50M)

Q.No		Questions	KL	CO	M
2		Unit-I			
	a	i) Discuss the construction and working of ruby laser.	K2	1	5M
		ii) Derive the relation between Einstein's coefficients obtained for the different processes enabled when light interacts with matter.	K2	1	5M
		OR			
	b	i) Describe the cross section of step index and graded index fibers. Explain the light propagation in these fibers.	K3	1	5M
		ii) Derive the expression for numerical aperture of an optical fiber. Discuss its importance.	K2	1	5M
3		Unit-II			
	a	i) What is atomic packing factor? Derive the atomic packing factor for FCC crystal system.	K2	2	4M
		ii) Based on unit cell parameters, classify the Bravais lattices.	K3	2	6M
		OR			
	b	i) State and Explain Bragg's law. How this might be helpful to explain the crystal structure of solids.	K3	2	5M
		ii) Discuss the experimental set up and working of powder diffraction method in the determination of crystal structure.	K2	2	5M

4		Unit-III			
	a	i) Discuss the classification of magnetic materials based on variation of magnetization, susceptibility and temperature.	K3	3	7M
		ii) Derive the relation between susceptibility and permeability of magnetic materials.	K2	3	3M
		OR			
	b	i) What is Meissner effect? Prove that the superconductors are perfect diamagnetic materials.	K2	3	5M
		ii) Classify type-I and type-II superconductors.	K2	3	5M
5		Unit-IV			
	a	i) Assuming particle in a potential well, derive the probability density function and energy of the particle for the three states.	K3	4	10M
		OR			
	b	i) Describe the Fermi-Dirac equation. Mention the merits and demerits of classical free electron theory of metals.	K2	4	5M
		ii) Derive the electrical conductivity based on classical free electron theory of metals.	K2	4	5M
6		Unit-V			
	a	i) State and explain Hall effect and derive the relation between Hall coefficient and Hall voltage.	K2	5	7M
		ii) Describe the diffusion currents in semiconductors.	K3	5	3M
		OR			
	b	i) Describe the properties of shape memory alloys, piezoelectric materials.	K2	5	5M
		ii) Discuss the properties of magneto rheological fluids, chromic materials.	K2	5	5M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

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NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

I B.Tech II Semester Regular & Supple. Examinations, May-2025

Sub Code: R23CC1206 **COMMUNICATIVE ENGLISH**

Time: 3 hours (CE,EEE,ME,ECE,CSE(AIML),DS,CS,AIML) Max. Marks: 70

Note: Question Paper consists of Two parts (Part-A and Part-B)

PART-A

Answering all the questions from Part-A is compulsory (10 x 2M = 20M)

Q.No		Questions	KL	CO	M
1	a	a) Define Skimming.	K2	1	2M
	b	b) Rewrite the following sentence using proper Punctuation marks: yes jim said i'll be home by ten	K3	1	2M
	c	c) What is the central idea of the "Brook"?	K2	4	2M
	d	d) What is Homophone?	K2	2	2M
	e	e) Briefly describe any one early business venture of Musk.	K2	3	2M
	f	f) Use the following Compound words in sentences of your own: 1. warmhearted 2. homemade	K2	3	2M
	g	g) What announcement by the National Peace Council does Elizabeth show her brother?	K2	4	2M
	h	h) What is meant by Jargon?	K2	4	2M
	i	i) How does intrapersonal communication helps us overcome challenges?	K2	4	2M
	j	j) Identify the errors and rewrite the following sentences correctly. 1. I went to the India in 1975. 2. I can speak the English.	K3	2	2M

PART-B

Answer either 'a' or 'b' from each question of **PART-B** (5 x 10M = 50M)

Q.No		Questions	KL	CO	M
2		Unit-I			
	a	Discuss how poverty influences the decisions and actions of Jim and Della.	K4	4	10M
		OR			
	b	i) Write the Synonyms for the following words: 1. Meticulous 2. Hazardous 3. Lucid 4. Rarely 5. wreck	K2	2	5M
		ii) Go through the following sentences and identify the parts of speech for the underlined words. 1. The water was very cold, but the child still jumped into the pool. 2. The sales section of the factory is on the fourth floor. 3. It has been raining heavily all night and the fields are full of water now. 4. Mr. Khan will be leaving for Chennai tomorrow. 5. The apples are rotten now. They were bought yesterday, but no one ate them.	K2	2	5M

3		Unit-II			
	a	How does the poet descried landscape, flowers, plants and colours in the poem? How does it make you feel as a reader? Substantiate your answer with examples from the poem "The Brook".	K2	2	10M
		OR			
	b	i) Write a paragraph on "Advantages and disadvantages of using AI".	K4	5	5M
		ii) Write the correct article in the blanks given below. Put 'X' in the blank if no article is needed. 1. Have you kept my book back on ____ shelf in my room? 2. We flew over ____ Pacific Ocean. 3. ____ education is essential for personal growth. 4. _____ peacock is our national bird. 5. _____ information provided was insufficient.	K3	2	5M
4		Unit-III			
	a	Elaborate the success of Elon Musk.	K3	3	10M
		OR			
	b	i) What is summarizing? Explain how to write an effective summary.	K3	4	5M
		ii) Fill in the blanks with the correct form of the verb. 1. Each of the girls ____ her own dress. (has/have) 2. All the students _____ excited to visit the museum after school. (is/are) 3. Neither Joseph nor his family ____ French. (speaks/speak) 4. The level of pain tolerance ____ from person to person. (vary/varies) 5. Fast food, like burgers and street food, ____ harmful to our health. (is/are)	K3	2	5M
5		Unit-IV			
	a	Justify the title " The Toys of Peace".	K3	4	10M
		OR			
	b	i) Write an official letter to the Vice Chancellor of JNTUK to consider hosting the inter-university athletics competition.	K5	5	5M
		ii) Change the following sentences from Direct to Indirect Speech. 1. "There's a fly in my soup!" screamed Salim. 2. You said to me, "Have you read the article? 3. Rashid said to me, " Why are you late?" 4. Akram said, " I have to bring this bag". 5. She said, " Alas! My brother failed the test".	K3	2	5M
6		Unit-V			
	a	Elaborate how cultivating intrapersonal communication skills contributes to leadership skills.	K2	5	10M
		OR			
	b	Write an essay of about 100 words describing the role of youth in nation building.	K3	5	10M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

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NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

I B.Tech II Semester Regular & Supple. Examinations, May-2025 **R23**

Sub Code: R23CC1207 **CHEMISTRY**

Time: 3 hours (EEE,ECE,CSE(AIML),DS,CS,AIML) Max. Marks: 70

Note: Question Paper consists of Two parts (Part-A and Part-B)

PART-A

Answering all the questions from Part-A is compulsory (10 x 2M = 20M)

Q.No		Questions	KL	CO	M
1	a	Predict the magnetic character of CO molecule.	K1	1	2M
	b	Give any two examples of intra molecular H-bonding.	K1	1	2M
	c	Write any two applications of super conductors.	K1	2	2M
	d	Write any two properties of carbon nanotubes.	K1	2	2M
	e	Define secondary cell with example.	K1	3	2M
	f	Give any two examples of electrochemical cell.	K1	3	2M
	g	State the thermoplastics with examples.	K1	4	2M
	h	Mention any two properties of Buna-N Rubber.	K1	4	2M
	i	Define Beer-Lambert's law.	K1	5	2M
	j	Outline any two applications of NMR spectroscopy.	K1	5	2M

PART-B

Answer either 'a' or 'b' from each question of **PART-B** (5 x 10M = 50M)

Q.No		Questions	KL	CO	M
2		Unit-I			
	a	i) How do you calculate bond order of hetero diatomic molecule using M.O diagram.	K1	1	5M
		ii) Discuss postulates of Molecular Orbital Theory.	K1	1	5M
		OR			
	b	i) Summarise π-Molecular Orbital energy level diagram of C_6H_6.	K2	1	5M
		ii) Explain H-bonding with examples.	K2	1	5M
3		Unit-II			
	a	i) Discuss Zone refining method for the preparation of semiconductors.	K2	2	5M
		ii) Explain Type-2 superconductors with examples.	K2	2	5M
		OR			
	b	i) Explain classification of supercapacitors.	K2	2	5M
		ii) Explain properties and applications of Graphenes nano particles.	K2	2	5M
4		Unit-III			
	a	i) Explain strong acid Vs strong base conductometric titration with graph.	K2	3	5M
		ii) Explain how to determine the endpoint of a potentiometric titration of a redox reaction.	K2	3	5M
		OR			
	b	i) Illustrate construction and working of Zinc-Air cell.	K4	3	5M
		ii) Describe Polymer Electrolyte Membrane Fuel cells(PEMFC).	K1	3	5M

5		Unit-IV			
	a	i) Explain chain growth mechanism of free radical polymerisation.	K2	4	5M
		ii) Demonstrate injection moulding technique with merits and demerits.	K2	4	5M
		OR			
	b	i) Explain preparation and properties of Buna-S rubber.	K2	4	5M
		ii) Discuss applications of Poly Lactic Acid(PLA).	K2	4	5M
6		Unit-V			
	a	i) Discuss electromagnetic spectrum.	K2	5	5M
		ii) Illustrate single beam UV-visible instrumentation.	K4	5	5M
		OR			
	b	i) Explain applications of Infrared spectroscopy.	K2	5	5M
		ii) Demonstrate FT-IR instrumentation.	K2	5	5M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

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NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

I B.Tech II Semester Regular & Supple. Examinations, May-2025 **R23**

Sub Code: R23CC1208 **ENGINEERING CHEMISTRY**

Time: 3 hours (CE & ME) Max. Marks: 70

Note: Question Paper consists of Two parts (Part-A and Part-B)

PART-A

Answering all the questions from Part-A is compulsory (10 x 2M = 20M)

Q.No		Questions	KL	CO	M
1	a	What is Temporary Hardness, give example?	K1	1	2M
	b	Define Electro dialysis?	K1	1	2M
	c	Define EMF?	K1	2	2M
	d	What is corrosion?	K1	2	2M
	e	What is polymerization?	K1	3	2M
	f	Define thermoplastics and give example?	K1	3	2M
	g	Define composites?	K2	4	2M
	h	Define viscosity index?	K1	4	2M
	i	What is a colloid?	K2	4	2M
	j	Write the principle of SEM?	K1	4	2M

PART-B

Answer either 'a' or 'b' from each question of **PART-B** (5 x 10M = 50M)

Q.No		Questions	KL	CO	M
2		Unit-I			
	a	i)Explain the estimation of hardness of water by EDTA method?	K2	1	5M
		ii)Explain caustic embrittlement and how it is prevented?	K5	1	5M
		OR			
	b	i)Explain Ion-exchange process?	K2	1	5M
		ii)Explain specifications for drinking water?	K3	1	5M
3		Unit-II			
	a	i)Define reference electrode and describe calomel electrode?	K3	2	5M
		ii)Explain construction, working and applications of lithium-ion battery?	K3	2	5M
		OR			
	b	i)Explain sacrificial anodic protection?	K2	2	5M
		ii)Explain the electroplating of copper?	K2	2	5M
4		Unit-III			
	a	i)Distinguish the differences chain growth and step growth polymerization?	K4	3	5M
		ii)Discuss preparation, properties and applications of Buna-S?	K6	3	5M

		OR			
	b	i)Explain refining of petroleum?	K2	3	5M
		ii)Explain Octane number?	K5	3	5M
		Unit-IV			
5	a	i)Explain factors affecting the refractory materials	K5	4	5M
		ii)Explain setting and hardening of cement?	K4	4	5M
		OR			
	b	i)Explain mechanism of Boundary film lubrication?	K2	4	5M
		ii)Explain Flash, Fire and Cloud point of lubricants?	K4	4	5M
		Unit-V			
6	a	i)Explain micelle formation?	K5	4	5M
		ii)How nano materials are prepared by chemical reduction method?	K3	4	5M
		OR			
	b	i)Classify CNT's types, properties and applications?	K4	4	5M
		ii)Explain synthesis of colloids by Bragg's method	K4	4	5M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

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NEC NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

I B.Tech II Semester Regular & Supple. Examinations, May-2025 **R23**

Sub Code: R23CC1209 **ENGINEERING MECHANICS**

Time: 3 hours (CE,ME) Max. Marks: 70

Note: Question Paper consists of Two parts (Part-A and Part-B)

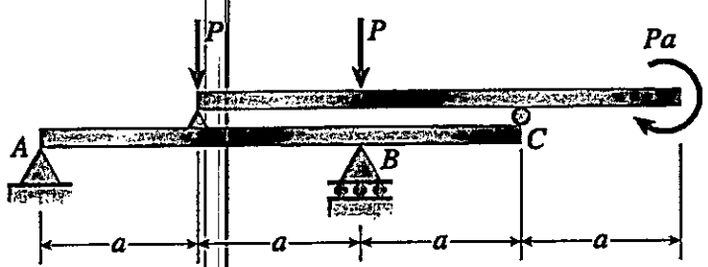
PART-A

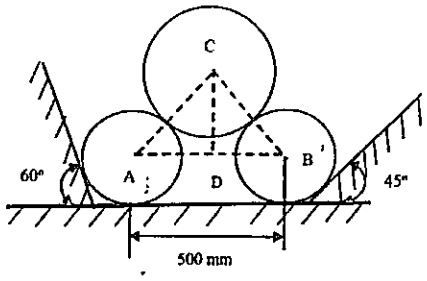
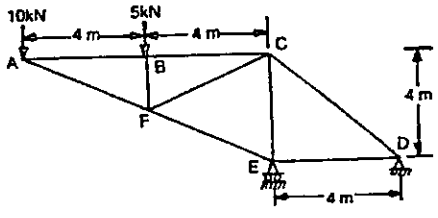
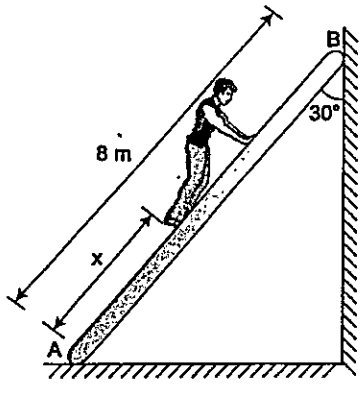
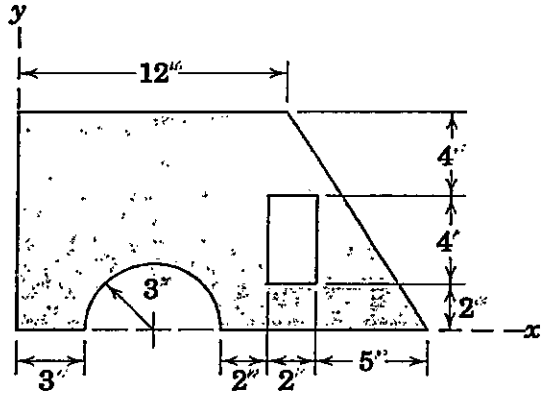
Answering all the questions from Part-A is compulsory (10 x 2M = 20M)

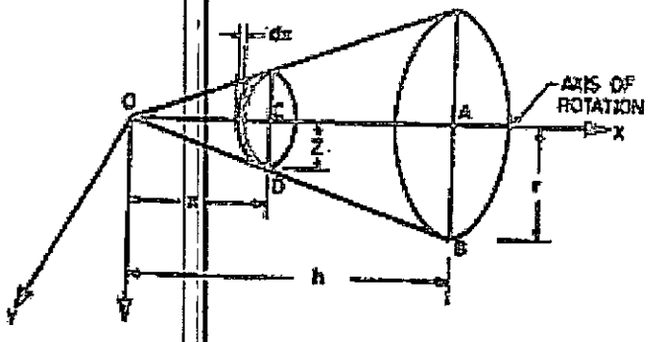
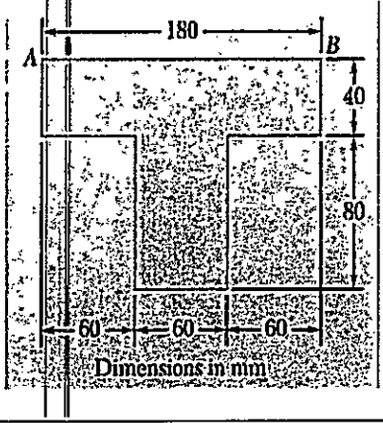
Q.No		Questions	KL	CO	M
1	a	State Parallelogram law of forces.	K1	1	2M
	b	Define Equillibrium and write the equations of equilibrium.	K1	1	2M
	c	Define a plane truss.	K1	2	2M
	d	Give the classification of friction.	K2	2	2M
	e	Define center of gravity and centroid.	K1	3	2M
	f	State Pappu's theorem.	K1	3	2M
	g	Define radius of gyration and give its expression.	K1	4	2M
	h	Define Polar Moment of Inertia.	K1	4	2M
	i	State the D'Alembert's principle.	K1	5	2M
	j	State work energy principle for translation.	K1	5	2M

PART-B

Answer either 'a' or 'b' from each question of **PART-B** (5 x 10M = 50M)

Q.No		Questions	KL	CO	M
2		Unit-I			
	a	i)State and prove Lami's theorem.	K2	1	5M
		ii) Determine the support reactions at A and B for the beam shown in the Fig. 	K3	1	5M
		OR			
	b	Three spheres are piled in a trench as shown in Fig. 1. Treating all the contact surface as smooth, determine the reactions developed at the contact surfaces. Given center to center distance between the sphere A and B is 500 mm. The self-weight of the cylinders A, B, C are 2.0 kN, 2.0 kN, 4.0 ksN respectively and diameters of the cylinders A, B, C are 400 mm, 400 mm, 600 mm respectively.	K3	1	10M

					
		Unit-II			
	a	In the overhanging truss shown in the fig, determine the member forces developed. Use method of joints. 	K3	2	10M
		OR			
3	b	i) A 800 N man starts climbing a ladder that placed against a wall as shown in given figure. Neglecting the weight of the ladder, determine how far up the ladder the man can climb before the ladder starts slipping. Assume coefficient of static friction between the surfaces as 0.25. 	K3	2	7M
		ii) State the laws of friction.	K1	2	3M
		Unit-III			
4	a	Locate the centroid of the shaded area of Fig. (All units are in cms) 	K3	3	10M
		OR			

	b	Obtain the Centre of gravity of the right circular cone of base radius r and height h shown in Fig. 	K3	3	10M
		Unit-IV			
5	a	Determine the moments of inertia of the area as shown in the Figure with respect to centroidal axes (both x and y axis) 	K3	4	10M
		OR			
	b	i) Derive the perpendicular axis theorem in area moment of inertia.	K2	4	5M
		ii) Derive the expression for mass moment of inertia of a rectangular plate of size b x h and thickness t about its centroidal axis.	K2	4	5M
		Unit-V			
6	a	The vertical motion of mass A is defined by the relation. $x = 10 \sin 2t + 15 \cos 2t + 100$, where x and t are expressed in 'mm' and 's', respectively. Determine (a) the position, velocity, and acceleration of mass A when t = 1 s, (b) the maximum velocity and maximum acceleration of mass A?	K3	5	10M
		OR			
	b	A train covers a distance of 1.6 km between two stations A and B in 2 minutes, starting from rest. In the first minute of its motion, it accelerates uniformly and in the last 30 seconds, it retards uniformly and comes to rest. It moves with a uniform velocity during the rest of the period. Find (a) average velocity and (b) its acceleration in the first minute.	K3	5	10M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

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No

NAARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

I B.Tech II Semester Regular & Supple. Examinations, May-2025 R23

Sub Code: R23CC1210 ELECTRICAL CIRCUITS ANALYSIS-I

Time: 3 hours (EEE) Max. Marks: 70

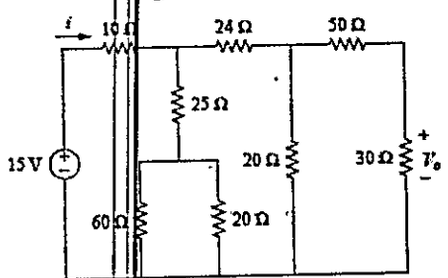
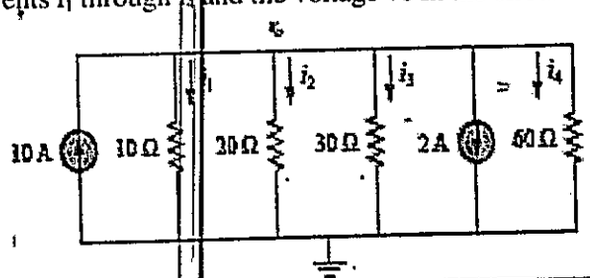
Note: Question Paper consists of Two parts (Part-A and Part-B)

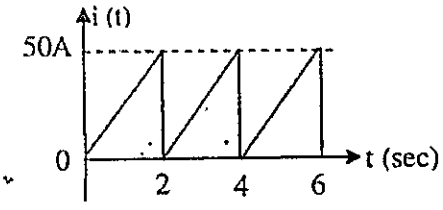
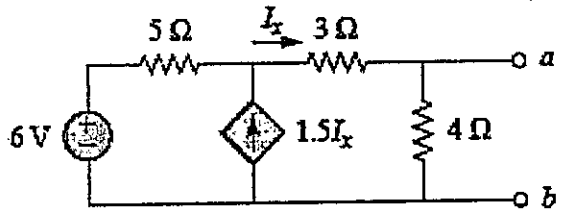
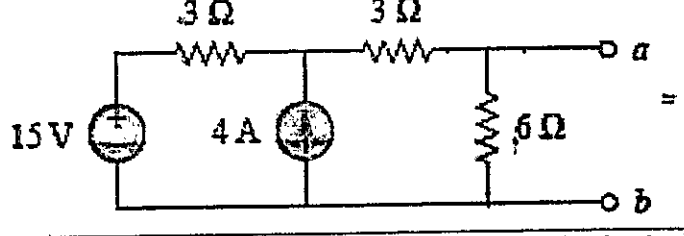
PART-A

Answering all the questions from Part-A is compulsory (10 x 2M = 20M)

Q.No		Questions	KL	CO	M
1	a	State ohm's law and specify the limitations of Ohm's law	K1	1	2M
	b	What is the current division rule for resistance in parallel circuit	K2	1	2M
	c	Definition of MMF and flux.	K1	2	2M
	d	Two identical coils, each have self inductance, L= 0.03H. If coefficient of coupling, k is 0.8, determine the value of mutual inductance between the coils, M.	K2	2	2M
	e	Define Average value, R.M.S. value	K1	3	2M
	f	What is power factor lading and power factor lagging	K2	3	2M
	g	List out the characteristics of Parallel Resonance	K2	4	2M
	h	Define Quality factor	K1	4	2M
	i	State the Reciprocity theorem	K1	5	2M
	j	State the compensation theorem	K1	5	2M

PART-B: Answer either 'a' or 'b' from each question of **PART-B** (5 x 10M = 50M)

Q.No		Questions	KL	CO	M
		Unit-I			
2	a	i) State and Explain the Volt-Ampere relationships for L and C Parameters	K2	1	5M
		ii) Find *i* and *Vo* in the circuit in Fig.1 	K3	1	5M
		OR			
	b	i) Explain about source transformation technique with suitable example	K1	1	5M
		ii) Find the currents i_1 through i_4 and the voltage vo in the circuit in Fig. 	K3	1	5M

		Unit-II			
3	a	i) Explain self-inductance and Mutual-inductance?	K1	2	5M
		ii) Explain Faraday's laws of Electromagnetic induction	K2	2	5M
		OR			
	b	i) Illustrate the dot rules of coupling circuits	K2	2	5M
		ii) Two coils are mutually coupled, with L1 = 25 mH, L2 = 60 mH, and k = 0.5. Calculate the maximum possible equivalent inductance if: (i) the two coils are connected in series (ii) the coils are connected in parallel	K3	2	5M
		Unit-III			
4	a	i) Calculate RMS value, average value, form factor for the waveform shown in Figure  	K3	3	5M
		ii) Define the following terms: (A) Instantaneous value (B) peak value (C) peak to peak value (D) Time Period (E) Frequency	K1	3	5M
		OR			
	b	Derive an expression for the current, impedance, average power for a series RC circuit excited by a sinusoidally alternating voltage and also find the power factor of the circuit. Draw the phasor diagram	K3	3	10M
		Unit-IV			
5	a	i) Draw the frequency response of a series RLC circuit and derive the expression for bandwidth, B and Quality factor, Q in terms of resistance R and inductance L	K2	4	5M
		ii) Derive a expression for half power frequencies in parallel RLC circuit	K2	4	5M
		OR			
	b	i) Obtain the current locus of a fixed resistance and a variable inductance	K2	4	5M
		ii) A series RLC circuit with R = 10 ohms, L = 0.4 H and C = 50 μF has applied voltage of 200V with variable frequency. Calculate the resonant frequency, current at resonance, voltage across R, L and C.	K3	4	5M
		Unit-V			
6	a	i) State and explain Superposition theorem with suitable example.	K2	5	5M
		ii) Find the Thevenin equivalent circuit of the following circuit to the terminals a and b  	K3	5	5M
		OR			
	b	i) Find the Norton's equivalent circuit for the following circuit  	K3	5	5M
		ii) Prove that the maximum power transfer to the load when the load resistance equals the load resistance.	K2	5	5M

NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

I B.Tech II Semester Regular & Supple. Examinations, May-2025

R23

Sub Code: R23EC1211 NETWORK ANALYSIS

Time: 3 hours (ECE) Max. Marks: 70

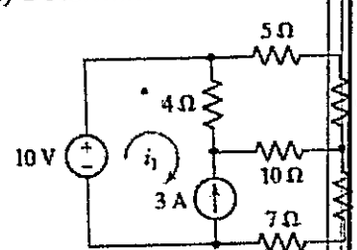
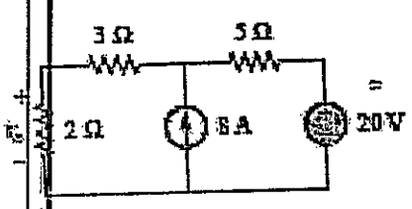
Note: Question Paper consists of Two parts (Part-A and Part-B)

PART-A

Answering all the questions from Part-A is compulsory (10 x 2M = 20M)

Q.No		Questions	KL	CO	M
	a	Define node analysis and mesh analysis	K1	1	2M
	b	State Substitution theorem.	K1	1	2M
	c	Distinguish between steady state and transient response.	K1	2	2M
	d	What is the significant of initial conditions?	K1	2	2M
	e	Define Real power and Reactive power	K2	3	2M
	f	Draw a power triangle in series connected RLC networks	K2	3	2M
	g	Compare the properties of series and parallel resonance circuits.	K2	4	2M
	h	What is the difference between self-inductance and mutual inductance?	K1	4	2M
	i	Give conditions for symmetry and reciprocity for ABCD parameters	K1	5	2M
	j	What is an attenuator?	K1	5	2M

PART-B: Answer either 'a' or 'b' from each question of **PART-B** (5 x 10M = 50M)

Q.No		Questions	KL	CO	M
		Unit-I			
2	a	i) Explain about source transformation techniques with suitable example	K1	1	5M
		ii) State and explain Compensation theorem with suitable example.	K2	1	5M
		OR			
	b	i) Determine the current i_1 in the circuit of Fig. 	K2	1	5M
		ii) Using the superposition theorem, find v_o in the circuit in Fig. 	K1	1	5M

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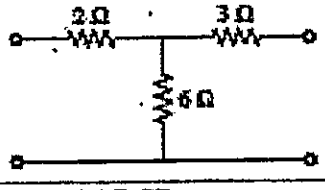
		Unit-II			
3	a	Derive the transient response of a series RL circuit with DC input using differential method. Sketch the variation of current and of the voltage across the inductor	K3	2	10 M
		OR			
	b	Derive an expression for i(t) in a series RLC circuit with sinusoidal excitation $\sin(\omega t + \theta)$ using laplace transformation technique. Assume that the circuit is initially relaxed.	K3	2	10 M
		Unit-III			
4	a	i) For a load $V_{rms} = 110\angle 85^\circ$ V, $I_{rms} = 0.4\angle 15^\circ$ A, Determine: (A) the complex and apparent powers, (B) the real and reactive powers, and (C) the power factor and the load impedance.	K2	3	10 M
		OR			
	b	i) Derive an expression for the current, impedance, average power for a series RL circuit excited by a sinusoidally alternating voltage. Draw the phasor diagram	K3	3	10 M
		Unit-IV			
5	a	i) Derive bandwidth expression in series RLC circuit	K1	4	5M
		ii) A series RLC circuit has resistance of 10Ω, an inductance of 0.3H and a capacitance of 100μF. The applied voltage is 230V. Find (A) The resonance frequency and quality factor (B) Voltage across the inductor and capacitor at resonance (C) Bandwidth	K2	4	5M
		OR			
	b	i) Illustrate the dot rules of coupling circuits	K2	4	5M
		ii) Two coupled coils with L1=0.01 H and L2=0.04 H and K=0.6 are connected in four different ways. Find the equivalent inductance if coils are connected in (A) series aiding (B) series opposing (C) parallel aiding (D) parallel opposing.	K2	4	5M
		Unit-V			
6	a	i) Find the hybrid parameters for the two-port network of Fig 	K2	5	5M
		ii) Derive h-parameters in terms of ABCD parameters?	K2	5	5M
		OR			
	b	i) Show that when two networks are connected in series the overall Z-parameters is the addition of individual Z-parameters of the two networks	K2	5	5M
		ii) Explain about impedance matching networks	K2	5	5M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

NARASARAOPETA
NEC ENGINEERING COLLEGE
(AUTONOMOUS)

I B.Tech I Semester Regular & Supple. Examinations, May-2025

R23

Sub Code: R23CC1212 **BASIC CIVIL AND MECHANICAL ENGINEERING**

Time: 3 hours (CE,EEE,ME,ECE,CSE(AIML),DS,CS,AIML) Max. Marks: 70

PART-A

(CE)

Q.No		Questions	KL	CO	M
1	a	What are the raw materials used in the manufacture of bricks?	K1	CO1	1M
	b	Mention two basic principles of survey.	K1	CO2	1M
	c	What is meant by contour mapping?	K1	CO2	1M
	d	What are the different modes of transportation?	K1	CO3	1M
	e	What are dams and reservoirs?	K1	CO3	1M
2		**Unit-I**			
	a	i) Explain in brief the roles of a Civil Engineer.	K1	CO1	5M
		ii) Explain the importance of a Geo-technical engineering discipline with a suitable example.	K2	CO1	5M
		OR			
	b	i) What are the qualities of a good cement?	K1	CO1	5M
		ii) Explain the major uses of cement and steel in the construction industry.	K2	CO1	5M
3		**Unit-II**			
	a	i) Define surveying. Explain its importance for civil engineers.	K2	CO2	5M
		ii) Differentiate between horizontal measurement and Angular measurement.	K1	CO2	5M
		OR			
	b	i) Explain about a typical chain with a neat sketch.	K2	CO2	5M
		ii) Define the following: 1. Level surface 2. Datum surface 3. Fore sight 4. Change point 5. Benchmark	K1	CO2	5M
4		**Unit-III**			
	a	i) Explain the role of highways in the Development of Nation.	K2	CO3	5M
		ii) Distinguish between Flexible and Rigid pavement.	K3	CO3	5M
		OR			
	b	i) List the major advantages of rainwater harvesting.	K2	CO3	5M
		ii) What is "Hydrologic Cycle" and also describe briefly the sources of hydrological data in India.	K3	CO3	5M

PART-B

Q.No		Questions	KL	CO	M
5	a	State the difference between ferrous and non-ferrous metals.	K2	CO1	1M
	b	Define Machining.	K1	CO2	1M
	c	List two products manufactured by the casting process.	K2	CO2	1M
	d	Sketch the links and Joints used in the robot	K3	CO3	1M
	e	State few applications of chain drives.	K2	CO3	1M
6		**Unit-IV**			
	a	i) Explain the role of mechanical engineers in the automotive sector.	K3	CO1	5M
		ii) What are ceramics? Outline the applications of ceramics.	K2	CO1	5M
		OR			
	b	i) Explain the advantages and applications of smart materials	K2	CO1	5M
		ii) Define Composites. State its applications	K2	CO1	5M
		Unit-V			
7	a	Classify manufacturing processes and explain any two types of manufacturing processes.	K4	CO2	10M
		OR			
	b	Explain the working principle of SI engine using p-v and T-S diagrams.	K4	CO2	10M
		Unit-VI			
8	a	i) Describe the working principle of a nuclear power plant with a neat sketch	K3	CO3	5M
		ii) Explain the advantages and applications of robots.	K3	CO3	5M
		OR			
	b	What are Belt drives? Classify the same and explain in brief any two types of belt drive with a suitable sketch.	K4	CO3	10M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks

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