NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

I B.Tech I Semester Regular Examinations, February-2024

R23

Sub Code: R23CC1101 **LINEAR ALGEBRA & 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	Define the rank of the matrix	1	1	2M
	b	Find the value of k such that the rank of $\begin{bmatrix} 1 & 2 & 3 \\ 2 & k & 7 \\ 3 & 6 & 10 \end{bmatrix}$ is 2.	2	1	2M
	c	Find the eigen values of $A=\begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$.	2	2	2M
	d	If $A=\begin{bmatrix} 0 & 0 & 0 \\ 1 & 2 & 0 \\ 5 & -1 & 6 \end{bmatrix}$ then what are the eigen values of A^4.	1	2	2M
	e	State Rolle's theorem.	1	3	2M
	f	Write the Maclaurin's series of $f(x)=e^x$.	1	3	2M
	g	If $u=\log(x+y+z)$ where $x=e^t$ $y=\sin t$ $z=\cos t$ find $\frac{du}{dt}$.	3	4	2M
	h	Verify Euler's theorem for $f(x,y)=ax^2+2hxy+by^2$.	3	4	2M
	i	Evaluate $\int_1^2\int_3^4 (xy+e^y)\,dy\,dx$.	5	5	2M
	j	Evaluate $\int_0^{\frac{\pi}{2}}\int_0^{a\sin\theta}\int_0^{\frac{a^2-r^2}{a}} r\,dz\,dr\,d\theta$.	5	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) Determine the rank of the matrix $\begin{bmatrix} 1 & 2 & -1 & 3 \\ 4 & 1 & 2 & 1 \\ 3 & -1 & 1 & 2 \\ 1 & 2 & 0 & 1 \end{bmatrix}$ by reducing into normal form.	4	1	5M
		ii) Test the consistency of the homogeneous system of linear equations $x+2y+3z=0; 3x+4y+4z=0; 7x+10y+12z=0$.	5	1	5M
		OR			
	b	Solve the system of equations by using Jacobi method $20x+y-2z=17; 3x+20y-z=-18; 2x-3y+20z=25$.	3	1	10M

3		Unit-II			
	a	Verify Cayley-Hamilton theorem for the matrix $A=\begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$ and find A^{-1} and A^4.	3	2	10M
		OR			
	b	Reduce the quadratic form $3x^2+5y^2+3z^2-2yz+2zx-2xy$ into canonical form by orthogonal transformation. Hence find its rank, index, signature and nature.	3	2	10M
4		Unit-III			
	a	Apply Lagrange's mean value theorem to prove $\frac{b-a}{1+b^2} < Tan^{-1}b - Tan^{-1}a < \frac{b-a}{1+a^2}$, $0<a<b<1$. Hence show that $\frac{\pi}{4}+\frac{3}{25} < Tan^{-1}\left(\frac{4}{3}\right) < \frac{\pi}{4}+\frac{1}{6}$.	3	3	10M
		OR			
	b	i) Verify Cauchy's mean value theorem for the functions $f(x)=\log_e x$, $g(x)=1/x$ in the interval $[1,e]$.	3	3	5M
		ii) Using Maclaurin's series, expand $f(x)=\cos x$ upto the term containing	3	3	5M
5		Unit-IV			
	a	i) If $x+y+z=u$, $y+z=uv$, $z=uvw$then find $J\left(\frac{x,y,z}{u,v,w}\right)$.	4	4	5M
		ii) Examine the following function for extreme values: $f(x,y)=x^4+y^4+4xy-2x^2-2y^2$	4	4	5M
		OR			
	b	i) If $u=f(r,s,t)$ where $r=\frac{x}{y}, s=\frac{y}{z}, t=\frac{z}{x}$, then show that $x\frac{\partial u}{\partial x}+y\frac{\partial u}{\partial y}+z\frac{\partial u}{\partial z}=0$.	3	4	5M
		ii) Expand x^y in powers of $(x-1)$ and $(y-1)$ upto terms of third degree.	4	4	5M
6		Unit-V			
	a	Change the order of integration and hence evaluate $\int_0^1 \int_{x^2}^{2-x} xy\, dy\, dx$.	5	5	10M
		OR			
	b	Find the volume of the tetrahedron bounded by the planes $x=0, y=0, z=0$ and $\frac{x}{a}+\frac{y}{b}+\frac{z}{c}=1$.	5	5	10M

NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

R23

I B.Tech I Semester Regular Examinations, February-2024

Sub Code: R23CC1102 **INTRODUCTION TO PROGRAMMING**

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	What is flowchart	1	1	2M
	b	What is time complexity	1	1	2M
	c	Write the syntax for nested if and else-if ladder?	1	2	2M
	d	Differentiate between break and continue.	1	2	2M
	e	What is an array? Write the types of an array	1	3	2M
	f	Differentiate puts() and gets()	1	3	2M
	g	What is pointer to pointer?	1	4	2M
	h	Define pointer array.	1	4	2M
	i	What is #include, #define directives	1	5	2M
	j	What is recursion	1	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)Write the structure of C program and explain	2	1	5M
		ii) Explain bitwise, increment and decrement and conditional operators with examples	2	1	5M
		OR			
	b	i) Explain the characteristics of an algorithm	2	1	5M
		ii) Compare and contrast top down approach and bottom up approach	3	1	5M
3		Unit-II			
	a	i) Differentiate between if statement and if-else statement with suitable examples	3	2	5M
		ii) Write a program to check whether the given number is palindrome or not	3	2	5M
		OR			
	b	i) Explain for , while and do while statement with syntaxes and suitable example program	3	2	5M
		ii) Write a calculator program in C language to do simple operations like addition, subtraction, multiplication and division using switch	3	2	5M

4		Unit-III			
	a	i) How to declare and initialize 1-D, 2-D array with an example	2	3	5M
		ii) Write a C program to find the largest element given in an array of elements	3	3	5M
		OR			
	b	i) What is an array? What are the different ways of initializing the arrays? What are the disadvantages of an array? Explain	2	3	5M
		ii)Write a C program to check whether the given matrix is symmetric or not.	3	3	5M
5		Unit-IV			
	a	i) Explain the array of pointes with example?	2	4	5M
		ii) Write a C program to find the sum and mean of all elements in an array using pointer	3	4	5M
		OR			
	b	i) Compare and Contrast structures and unions	3	4	5M
		ii) Write a C program to display the details of employees in an organization using structures. Employee Details include Name, ID, Gender, Contact number, Address	3	4	5M
6		Unit-V			
	a	i)Differentiate between call by value and call by reference with examples	2	5	5M
		ii) Write a function to find the factorial of given number	3	5	5M
		OR			
	b	i)List and explain various file functions available in C.	2	5	5M
		ii)Write a C program to copy the content of one file into another file.	3	5	5M

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

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NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

I B.Tech I Semester Regular Examinations, February-2024

Sub Code: R23CC1106 **ENGINEERING PHYSICS**

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	Mention any two applications of lasers in the industry.	K1	1	2M
	b	Explain the principle involved in the optical fiber.	K2	1	2M
	c	What are lattice parameters?	K1	2	2M
	d	Draw the planes of a cubic cell (i) (011) (ii) (121).	K4	2	2M
	e	Why diamagnetic materials have negative susceptibility?	K2	3	2M
	f	Define Meissner effect.	K1	3	2M
	g	State Heisenberg's uncertainty principle.	K1	4	2M
	h	Write any two draw backs of classical free electron theory.	K1	4	2M
	i	Write the Einstein's equation.	K1	5	2M
	j	Write the applications of shape memory alloys.	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	Marks
2		**Unit-I**			
	a	i) Mention the differences between spontaneous and stimulated emissions.	K1	1	2M
		ii) With the help of suitable diagrams, explain the principle, construction and working of a He-Ne laser.	K4	1	8M
		OR			
	b	i) What is meant by acceptance angle for an optical fiber? Obtain mathematical expression for acceptance angle and numerical aperture.	K5	1	8M
		ii) The refractive indices of an optical fiber of core and cladding are 1.48 and 1.46 respectively. Calculate its acceptance angle.	K4	1	2M
3		**Unit-II**			
	a	i) Obtain the expression for atomic radius and packing fraction of SC, BCC and FCC with neat diagrams.	K3	2	10M
		OR			
	b	i) Derive an expression for the interplanar spacing between two adjacent planes of Miller indices (h k l) in a cubic lattice of edge a.	K3	2	8M
		ii) Calculate the interplanar spacing for (221) plane in an SC lattice, where lattice constant is 4.2×10^{-10} m.	K4	2	2M
4		**Unit-III**			
	a	i) Explain the B-H curve of ferromagnetic material on the basis of domain theory.	K2	3	8M
		ii) A magnetic field of 1800A/m produces a magnetic flux of $3x10^{-5}$ Wb / m^2 in an iron bar of cross sectional area 0.2 cm^2. Calculate hysteresis loss per cycle.	K4	3	2M
		OR			
	b	i) How the BCS theory explains superconductivity.	K2	3	8M
		ii) Mention the differences between type-1 and type -2 super conductors.	K1	3	2M

5		**Unit-IV**			
	a	i) Obtain an expression for the wave function of a particle enclosed in one-dimensional potential box of infinite height.	K5	4	10M
		OR			
	b	i) Explain briefly the quantum free electron theory.	K2	4	4M
		ii) Derive the expression for electrical conductivity based on quantum free electron theory.	K3	4	6M
6		**Unit-V**			
	a	i) Derive the expression for Hall coefficient. How is the Hall coefficient related to the mobility of charge carriers?	K3	5	10M
		OR			
	b	i) What are smart materials?	K1	5	2M
		ii) Explain the principle of piezoelectric, magnetostrictive and thermoelectric materials.	K2	5	8M

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

NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

I B.Tech I Semester Regular Examinations, February-2024 **R23**

Sub Code: R23CC1103 **COMMUNICATIVE ENGLISH**

Time: 3 hours (CSE, IT, CSE(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	What kind of combs did Jim buy for Della?	K3	CO1	2M
	b	Distinguish between 'Skimming' and 'Scanning'.	K3	CO2	2M
	c	Explain the significance of the line 'For men may come and men may go, But I go on forever', in the poem 'The Brook'.	K3	CO1	2M
	d	Elaborate 'Sequencing'.	K3	CO3	2M
	e	Describe Musk's determination and goals that affected the space industry.	K3	CO1	2M
	f	Fill in the blanks with suitable verb forms. i) We _____rice every day. (eat) ii) How have you been_____? (do)	K3	CO3	2M
	g	Discuss any two of the "peace toys" that Harvey brings Eric and Bertie.	K3	CO1	2M
	h	Fill the blanks with the correct word chosen from the options given in brackets. i) I _____ the chef for the excellent dinner. (complimented/complemented) ii) There has been a huge_____ in petrol prices. (rise/raise)	K3	CO4	2M
	i	Analyse the benefits of developing strong intrapersonal communication skills.	K3	CO1	2M
	j	Correct the following sentences. i) I saw a elephant in the forest. ii) The police is coming.	K3	CO3	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 central theme of "the Gift of Magi".	K3	CO1	7M
		ii) Rewrite the jumbled sentences in the correct order. a) The platform is on the train. b) Water the cold is. c) Brother my tea loves.	K3	CO3	3M
		OR			
	b	i) Identify the parts of speech for the following sentences. a) Her dress was beautifully designed. b) My sister lives in England. c) The weather was very cold yet she tried to go out. d) They are five members in the team. e) Which is the capital of India?	K3	CO3	5M
		ii) Write the Synonyms for the following words. a) clever b) big c) sparkling d) calm e) afraid	K3	CO4	5M
3		Unit-II			
	a	i) 'The Brook' offers a visual treat of sight and sound. Explain.	K3	CO1	7M
		ii) Write a short paragraph of 120-150 words on the following topic. "Social media and the youth."	K6	CO2	3M
		OR			
	b	i) Fill the blanks with suitable articles. a) Let me give you _____ umbrella. b) Ravi wants to join _____ University. c) Susan is _____ fastest sprinter in the college. d) I always use _____HB pencil. e) She gave him _____ rupee.	K3	CO3	5M
		ii) Fill in the blanks with suitable propositions. a) The guests are coming_____ five O' clock. b) Meena is fond _____ sweets. c) Sudha sits _____ Gita and Sita. d) I have known her_____ last month. e) He goes to college _____ foot.	K3	CO3	5M
4		Unit-III			
	a	i) Elaborate the significance of 'audacious goals' in Elon Musk's story with relevant examples.	K3	CO1	7M
		ii) Summarize the following paragraph There are times when the night sky glows with bands of colour. The bands may begin as cloud shapes and then spread into a great arc across the entire sky. They may fall in folds like a curtain drawn across the heavens. The lights usually grow brighter, then suddenly dim. During this time the sky glows with pale yellow, pink, green, violet, blue, and red. These lights are called the Aurora Borealis. Some people call them the Northern Lights. Scientists have been watching them for hundreds of years. They are not quite sure what causes them. In ancient times people were afraid of the Lights. They imagined that they saw fiery dragons in the sky. Some even concluded that the heavens were on fire.	K3	CO2	3M
		OR			
	b	i) Fill in the blanks with correct forms of the verbs. a) He _____ (play) football. b) She _____ (meet) you tomorrow. c) We _____ (watch) a movie last night. d) The Sun _____ (set) in the West. e) How long have you been _____ (work) here?	K3	CO3	5M
		ii) Correct the following sentences. a) Physics are my favourite subject. b) I prefer tea than coffee. c) The shop open at ten o'clock every day. d) It has been raining for eight o'clock this morning. e) Where you are staying?	K3	CO3	5M
5		Unit-IV			
	a	i) What imaginative ways do the boys find to use the 'peace toys' in their war games?	K3	CO1	7M
		ii) Fill in the blanks with the most appropriate reporting verbs given	K3	CO4	3M

		alongside. a) The people _____ (has/have) lived without electricity for many years. b) Darwin _____(proposed/revealed) a revolutionary theory in 1859. c) He and I _____ (were/was) playing there.			
		OR			
	b	i) Prepare a resume along with cover letter for the position of a Team leader in Infosys.	K6	CO2	5M
		ii) Rewrite the following sentences as directed. a) Tania requested her friend to lend her an umbrella. (Change into Direct Speech) b) 'The birds are flying away', Kavitha says. (Change into Indirect Speech) c) The journal editor briefed the young reporter. (change into passive voice) d) Rice is grown in many parts of the country. (change into active voice) e) She asked me whether I played cricket. (Change into Direct Speech)	K3	CO3	5M
6		Unit-V			
	a	i) Analyse the ways that you can incorporate intrapersonal communication to contribute to leadership development.	K3	CO1	7M
		ii) Correct the errors in the following sentences. a) I am student b) My friends is planning a trip. c) Rita will finishes her project soon.	K3	CO3	3M
		OR			
	b	i) Write an essay on 'Climate change and its consequences'.	K3	CO2	5M
		ii) Read the paragraph and answer the questions that follow. Last Sunday, forest animals had a sports contest. Elephant Woody and Ant Nima had the Weight lift. Although Nima is smaller and thinner, she lifted much heavier things than her body, so she won. Next, Rabbit Rapid and Tortoise Trent had a race. Rapid thought he would be the winner. He laughed at Trent, "Follow me, slower guy? "He ran as fast as he could until he couldn't see Trent. "Let me have a rest, "he said to himself and slept under a big tree. Suddenly, he heard the cheers. Trent won the first prize. Rapid couldn't laugh again. 1. When did the forest animals have a sports contest? 2. Why could the ant win? 3. Did the rabbit win? 4. Why couldn't Rapid win the first prize? 5. Name the parts of speech of the word 'suddenly' from the passage.	K3	CO1	5M

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NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

I B.Tech I Semester Regular Examinations, February-2024

R23

Sub Code: R23CC1104 **BASIC CIVIL AND MECHANICAL ENGINEERING**

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

PART-A

(CE)

Q.No		Questions	KL	CO	M
1	a	List the properties of good building bricks. Explain any five.	K1	CO1	1M
	b	What are the principles of surveying	K1	CO1	1M
	c	Differentiate dams and reservoirs.	K1	CO2	1M
	d	What is the purpose of bearings?	K1	CO2	1M
	e	What are the different modes of transportation?	K1	CO3	1M
2		Unit-I			
	a	i) Explain the different construction materials used for the building	K1	CO1	5M
		ii) List out the major disciplines of civil engineering and explain their role	K2	CO1	5M
		OR			
	b	i) Briefly explain about how civil engineering contributes to the welfare of the society?	K1	CO1	5M
		ii) What are the different sub disciplines in civil engineering? Explain about any two of them?	K2	CO1	5M
		Unit-II			
3	a	i) What are the different types of levelling in surveying? Explain about them?	K2	CO2	5M
		ii) Explain the basic principles of chain surveying.	K1	CO2	5M
		OR			
	b	i) Discuss about the primary classification of surveying.	K2	CO2	5M
		ii) Describe a typical chain with a neat sketch.	K1	CO2	5M
		Unit-III			
4	a	i) Briefly explain Airport and Railway Engineering.	K2	CO3	5M
		ii) Write about Flexible Pavements and Rigid Pavements.	K4	CO3	5M
		OR			
	b	i) Importance of Transportation in Nation's economic development	K2	CO4	5M
		ii) What are the Specifications for Quality of water?	K1	CO4	5M

PART-B

(ME)

Q.No		Questions	KL	CO	M
5	a	What is the mechanical engineering role in Marine Engineering?	K2	CO1	1M
	b	Why petrol engines are called as SI engines?	K2	CO1	1M
	c	Explain the basic air conditioning cycles?	K2	CO1	1M
	d	List any two advantages and two disadvantages of belt drives	K3	CO1	1M
	e	Write the applications of robotics.	K2	CO1	1M
6		Unit-IV			
	a	Analyze the mechanical engineering technologies role in manufacturing sector?	K4	CO2	10M
		OR			
	b	i) Outline the applications of Ceramics?	K2	CO2	5M
		ii) What do you mean by Smart materials? Explain.	K4	CO2	5M
		Unit-V			
7	a	Classify manufacturing processes and analyze about any three types of manufacturing processes.	K2	CO3	10M
		OR			
	b	Explain the basic Refrigeration and air conditioning cycles?	K4	CO3	5M
		Explain the working of 4 stroke diesel engine with near sketches.	K2	CO3	5M
		Unit-VI			
8	a	i) Working principle of Steam plant with neat Sketch?	K4	CO4	5M
		ii) Explain the Basic components of Robot	K2	CO4	5M
		OR			
	b	i) Explain the working principle of Hydro power plant with neat Sketch?	K4	CO4	5M
		ii) Write about Gear Drives and their applications.	K2	CO4	5M

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

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NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

I B.Tech I Semester Regular Examinations, February-2024

R23

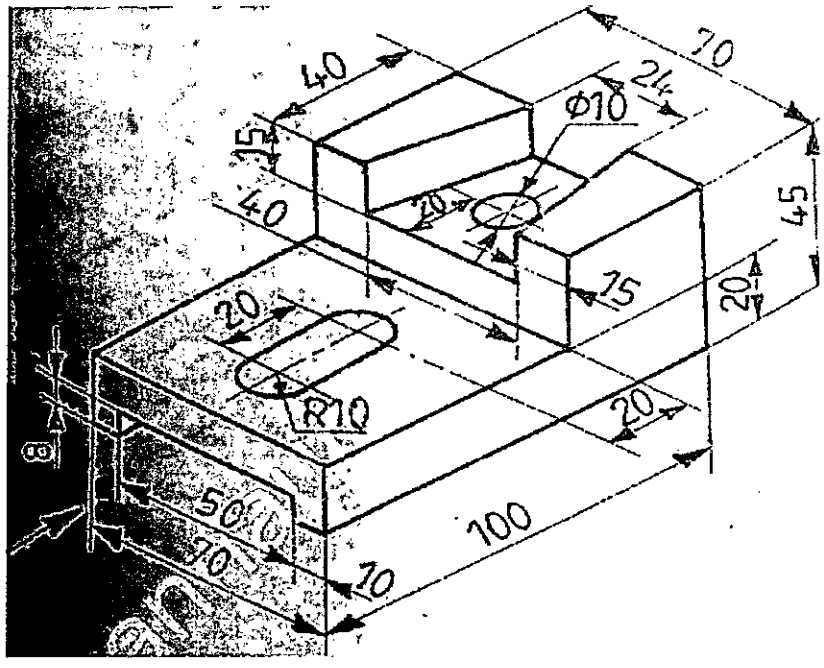
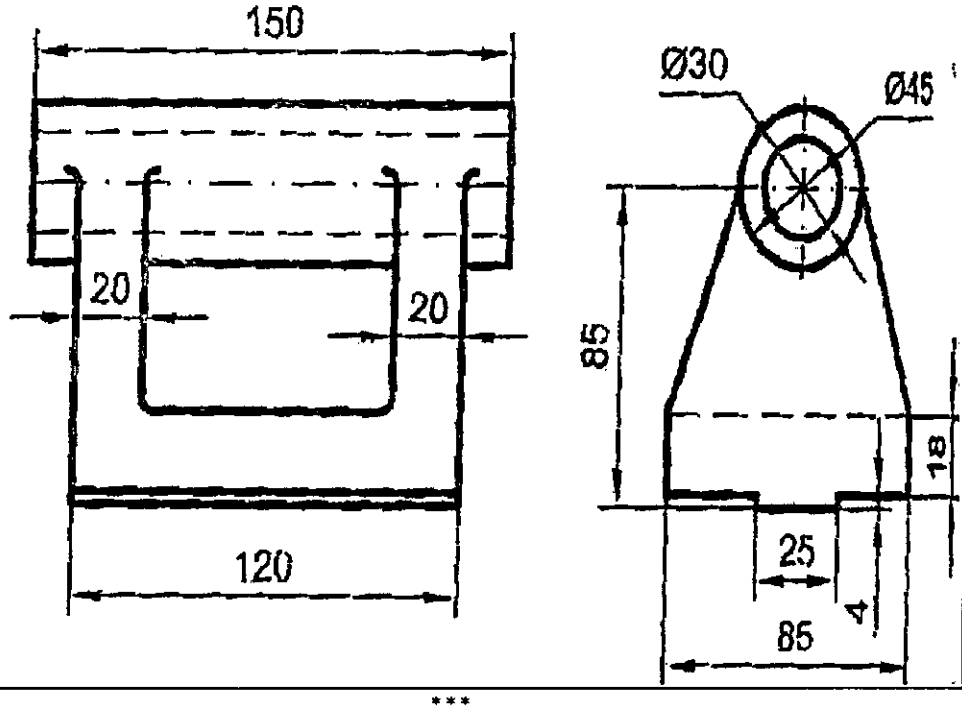
Sub Code: R23CC1108 **ENGINEERING GRAPHICS**

Time: 3 hours (ECE) 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	Construct a parabola, with the distance of the focus from the directrix as 50 mm. Also, draw a normal and tangent to the curve at a point 40 mm from the directrix.	3	1	14M
		OR			
	b	A water tank of size $27m^3$ in the drawing by 216 cm^3 size. Construct a vernier scale for the same to measure up to 5 m. Show on it, the following lengths i) 3.95m (ii) 0.27 m (iii) 0.042 m.	3	1	14M
2		Unit-II			
	a	i) A line EF 40mm long is in the VP and inclined to the HP. The top view measures 30mm. The end E is 10mm above the HP. Draw the projections of the line. Determine its inclination with the HP? ii)A line RS 40mm long is parallel to both the planes. It is 20 mm above the HP and 15mm in front of the V P. Draw the projections of the line?	3	2	14M
		OR			
	b	A pentagonal lamina of edges 25mm is resting on HP with one of its corners such that the edge opposite to this corner is 20mm above HP and makes an angle of 45° with VP. Draw the top and front views of the lamina in this position. Determine the inclination of the lamina with HP.	3	2	14M
3		Unit-III			
	a	A hexagonal pyramid 25mm side of base and 50mm axis length rest on HP on one of its slant edges. Draw the projections of pyramid when the axis is inclined at 45° with VP.	3	3	14M
		OR			
	b	A right circular cone, 40 mm base diameter and 60 mm long axis is resting on H.P on one point of base circle such that its axis makes 45^0 inclination with H.P and 40^0 inclination with V.P. Draw the projections of the cone.	3	3	14M
4		Unit-IV			
	a	A square prism with a base having 40 mm sides and height 60 mm is kept on its base on the H.P. such that one of its rectangular faces makes an angle of 30^0 with V.P. It is cut by a section plane parallel to V.P. such that the true shape of the section is a rectangle with 30 mm and 60 mm sides. Draw its sectional front view and top view.	3	4	14M
		OR			
	b	A regular pentagonal pyramid of side of base 35mm and altitude 65mm has its base on HP with a side of base perpendicular to VP. The pyramid is cut by a section plane which is perpendicular to VP and inclined at 30° to HP. The cutting plane meets the axis of the pyramid at a point 30mm below the apex. Draw the development of the remaining part of the pyramid.	3	4	14M

5		Unit-V			
	a	Draw (i) Front view (ii) Top view (iii) Right side view of the pictorial view shown below?  	3	5	14M
		OR			
	b	Draw isometric view of the following orthographic views.  	3	5	14M

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NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

I B.Tech I Semester Regular Examinations, February-2024 **R23**

Sub Code: R23CC1105 **CHEMISTRY**

Time: 3 hours (CSE,IT & 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	Define Bond Order	K1	1	2M
	b	What is BMO and ABMO?	K1	1	2M
	c	Define Super conductor	K1	2	2M
	d	Write any two Properties of Fullerenes	K1	2	2M
	e	Define Standard Reduction Potential	K1	3	2M
	f	Draw the conductometric titration graph of a strong acid with a strong base	K1	3	2M
	g	What are Biodegradable polymers?	K1	4	2M
	h	Mention two examples for Conducting polymers	K1	4	2M
	i	State Beer- Lambert Law	K1	5	2M
	j	What is NMR?	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)Draw π- Molecular Orbital energy level diagram of 1,3-Butadiene	K5	1	5M
		ii)Differentiate between Intermolecular Hydrogen Bonding and Intramolecular Hydrogen Bonding with suitable examples	K2	1	5M
		OR			
	b	i)Calculate Bond order of O_2 molecule	K2	1	5M
		ii)Give the postulates of LCAO theory	K3	1	5M
3		Unit-II			
	a	i) How do you prepare Semiconducting Materials by Czochralski Method	K4	2	5M
		ii)Give the Difference between Type-I and Type-II Superconductors with suitable examples	K2	2	5M
		OR			
	b	i)Mention two properties and a preparation method for Graphene Nano material	K2	2	5M
		ii) Give a Preparation method of Nano materials by one method of your own choice	K2	2	5M

4		Unit-III			
	a	i)Sketch the Schematic Representation of Potentiometric Sensor and give its applications	K2	3	5M
		ii)What is Electrochemical Series?.Give a few important applications	K2	3	5M
		OR			
	b	i) Present any two differences between Primary, Secondary Cells and explain the functioning of Lithium ion Battery	K4	3	5M
		ii) What are Fuel Cells?.Mention the types of it.Give the equations involved in Hydrogen Oxygen Fuel cells	K2	3	5M
5		Unit-IV			
	a	i)Explain Mechanism of free radical polymerization in Poly ethylene	K2	4	5M
		ii)Define Moulding of polymers. Describe any by any one method with a neat diagram	K3	4	5M
		OR			
	b	i)What are Elastomers. Give any two properties and applications of Buna-S	K2	4	5M
		ii).Give the preparation method of Bakelite with equations	K2	4	5M
6		Unit-V			
	a	i)Discuss thoroughly about FT-IR Instrumentation	K2	5	10M
		OR			
	b	i)What kind of Types of electronic transitions do you observe in UV. Give some examples	K3	5	10M

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

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NEC NARASARAOPET'A
ENGINEERING COLLEGE
(AUTONOMOUS)

I B.Tech I Semester Regular Examinations, February-2024

R23

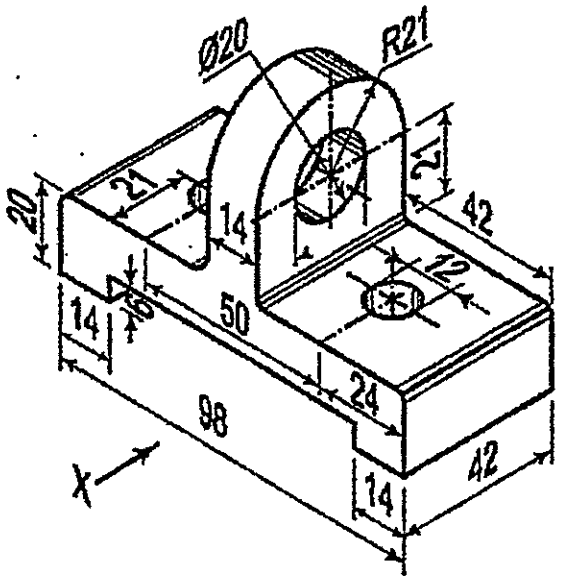
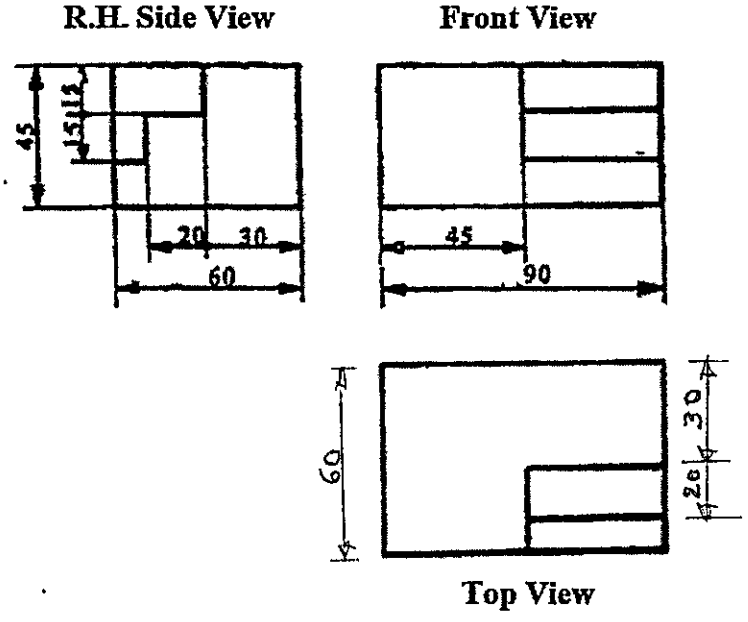
Sub Code: R23CC1108 | **ENGINEERING GRAPHICS**

Time: 3 hours (CE, EEE, ME, CSE (AIML), DS, CS & AIML) 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 cycloid of a circle of 60 mm diameter for one revolution. Draw a tangent and normal at any point on it.	K3	CO1	14M
		OR			
	b	Construct a diagonal scale of R.F=1/4000 to show metres and long enough to measure upto 500 metres. Mark a length of 352 meters on it.	K2	CO1	14M
2		**Unit-II**			
	a	A line AB, 90 mm long, is inclined at 45^0 to the H.P. and its top view makes an angle of 60^0 with the V.P. The end A is in the H.P. and 12 mm in front of V.P. Draw its front view and finds its true inclination with the V.P.	K3	CO2	14M
		OR			
	b	A rectangle of 30 mm and 50 mm sides is resting on HP on one of its small side which is 30^0 inclined to VP, while the surface of the plane makes 45^0 inclination with HP. Draw it's projections.	K3	CO2	14M
3		**Unit-III**			
	a	A hexagonal pyramid, base 30 mm side axis 50 mm long, has an edge of its base on the ground. Its axis is inclined at 30^0 to the ground and parallel to the VP. Draw its projections.	K4	CO3	14M
		OR			
	b	A cone 50 mm diameter and 60 mm axis is resting on one generator on HP Draw its projections.	K3	CO3	14M
4		**Unit-IV**			
	a	A square pyramid, base 40 mm side and axis 65 mm long, has its base on the H.P. and all the edges of the base equally inclined to the V.P. It is cut by a section plane, perpendicular to the V.P., inclined at 45^0 to the H.P. and bisecting the axis. Draw its sectional top view, sectional side view and true shape of the section.	K4	CO4	14M
		OR			
	b	A hexagonal prism of base side 20 mm and height 45 mm is resting on one of its ends on the HP with two of its lateral faces parallel to the VP. It is cut by a plane perpendicular to the VP and inclined at 30^0 to the HP. The plane	K4	CO4	14M

		meets the axis at a distance of 20 mm above the base. Draw the development of the lateral surfaces of the lower portion of the prism.			
		Unit-V			
5	a	Draw the (i) Front view (**Marked as 'X'**) (ii) Top view and (iii) Side view for the below figure.  (Note: All dimensions are in **mm**)	**K4**	**CO5**	**14M**
		OR			
	b	Draw isometric view for the given orthographic projections.  (Note: All dimensions are in **mm**)	**K4**	**CO5**	**14M**

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

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NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

I B.Tech I Semester Regular Examinations, February-2024

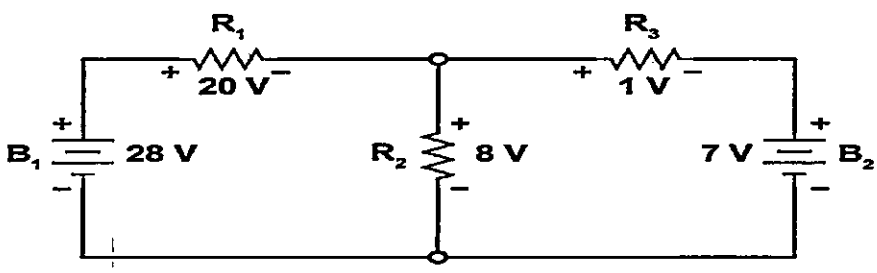
R23

Sub Code: R23CC1107 **BASIC ELECTRICAL & ELECTRONICS ENGINEERING**

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

PART-A

(EEE)

Q.No		Questions	KL	CO	M
1	a	Memorize the limitations of ohm's law?	1	1	1M
	b	Define the impedance of electrical network?	1	1	1M
	c	Memorize the principle of operation of DC mechanical output device?	1	2	1M
	d	What is meant by conventional source of energy?	1	3	1M
	e	Define electrical tariff?	1	4	1M
2		Unit-I			
	a	i) Compare the series and parallel networks with circuit diagrams?	3	1	5M
		ii) Find the total current of the circuit using super position theorm 	3	1	5M
		OR			
	b	i)Derive the average, RMS and peak expressions of a sinusoidal waveform?	3	1	5M
		ii)An alternating voltage has the equation of v=118.7 sin 314t. Calculate the R.M.S voltage, frequency and the instatenenous voltage when t=3.8 ms?	3	1	5M
		Unit-II			
3	a	i)Draw the diagram and explain the construction of generator?	3	2	10M
		OR			
	b	i)Derive and analize the balance condition of wheat stone bridge with circuit diagram?	3	2	5M
		ii)Compare the features of moving coil and moving iron measuring instruments?	3	2	5M
		Unit-III			
4	a	i)Explain the wind energy generation with block diagram?	3	3	5M
		ii)Discuss the safety precautions to prevent the electric shock?	3	4	5M
		OR			
	b	i)Elaborate the objcetives and outcomes of earthing?	3	4	5M
		ii)Discuss in detail about the merits and demerits of meaniature circuit breaker?	3	4	5M

PART-B

(ECE)

Q.No		Questions	KL	CO	M
5	a	Write the advnatages if electronic components?	1	1	1M
	b	What is meant by PN junction diode?	1	1	1M
	c	What is meant by capacitor filter?	1	2	1M
	d	Draw the truth table of NOR gate?	1	3	1M
	e	What is meant by the ring counter?	1	4	1M
6		Unit-IV			
	a	i)Define Zener effect and analyze the characteristics of zener diode?	3	1	8M
		ii)Find the value of emitter current and collector current of a transistor having α=0.88 and the collector to base leakage current I_{CBO}=4.2 micro ampere? The base current is 56 micro ampere?	3	1	2M
		OR			
	b	i)Draw the diagram and explain the CC configuration of Bipolar junction diode?	3	1	5M
		ii)Analyze the common base configaration of a PNP transitor amplifier with relevant expressions?	3	1	5M
		Unit-V			
7	a	i)Explain in detail about the working of electronic instrumentation system with block diagram?	3	2	5M
		ii)Derive the output voltage waveform of a full wave bridge rectifier?	3	2	5M
		OR			
	b	i)Describe the frequency response of RC coupled common emitter amplifier with circuit diagram?	3	2	5M
		ii)Discuss in detail about the desirable features and supporting equipment of public address system?	3	2	5M
		Unit-VI			
8	a	i)Compare the gray code and hamming codes with example?	3	3	5M
		ii)Explain the decimal system to binary system conversion with an example?	3	3	5M
		OR			
	b	i)Compare the S-R and J-K flip flops?	4	4	5M
		ii)Analyze the assciative laws of Boolean algebra with truth tables?	3	3	5M