R23

I B.TECH I SEM

SUPPLEMENTARY

END EXAMINATION QUESTION PAPERS

MAY/JUNE 2025

NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

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

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	Compute the Rank of the matrix $A=\begin{bmatrix}2 & 1\\ 1 & -1\\ 3 & 2\end{bmatrix}$.	K3	1	2M
	b	Determine the values of k for which the system of equations $x-ky+z=0,\ kx+3y-kz=0,\ 3x+y-z=0$ Has only trivial solution.	.K 3	1	2M
	c	Identify the eigen values of $A=\begin{bmatrix}1 & 1\\ -1 & 1\end{bmatrix}$.	K4	2	2M
	d	Transform the quadratic form $2(x^2+xy+y^2)$ to canonical form.	K4	2	2M
	e	Discuss the applicability of Rolle's theorem to the function $f(x)=x$ in -1,1.	K3	3	2M
	f	Demonstrate Cauchy's mean value theorem.	K3	3	2M
	g	If $u=x^2\tan^{-1}\left(\frac{y}{x}\right)-y^2\tan^{-1}\left(\frac{x}{y}\right), xy\neq 0$, compute $\frac{\partial^2 u}{\partial x\partial y}$.	K3	4	2M
	h	If $y^3-3ax^2+x^3=0$, compute $\frac{d^2y}{dx^2}$.	K3	4	2M
	i	Find the area bounded by the curves $y^2=x^3$ and $x^2=y^3$.	K3	5	2M
	j	Find the area bounded by the curves $y=x$ and $y=x^2$.	K3	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) Compute A^{-1} using Gauss-Jordan method, given $A=\begin{bmatrix}1 & 2 & 3\\ 1 & 3 & 6\\ 2 & 6 & 13\end{bmatrix}$	K3	CO-1	5M
		ii) Solve the system of linear equations $x+y-2z+4w=5$, $2x+2y-3z+w=3$ and $3x+3y-4z-2w=1$	K3	CO-1	5M
		OR			
	b	Perform four iterations of the Gauss-Seidel iteration method to solve the system of equations $4x+y+2z=-1,\ x+5y+z=5,\ 2x+y+4z=3$. Take the initial approximation as zero vector.	K3	CO-1	10 M
3		Unit-II			
	a	Find all the eigen values and the corresponding eigen vectors of the matrix $A=\begin{bmatrix}1 & 2 & 2\\ 0 & 2 & 1\\ -1 & 2 & 2\end{bmatrix}$.	K3	CO-2	10 M

		OR			
	b	Verify Cayley-Hamilton theorem of the matrix $A=\begin{bmatrix}1 & 2 & 0\\ -1 & 1 & 2\\ 1 & 2 & 1\end{bmatrix}$ Also, obtain A^{-1} and A^3.	K3	CO-2	10 M
		Unit-III			
4	a	i) Use Lagrange's mean value theorem to prove that $\frac{v-u}{1+v^2}<\tan^{-1}v-\tan^{-1}u<\frac{v-u}{1+u^2}$ and deduce that $\frac{\pi}{4}+\frac{3}{25}<\tan^{-1}\left(\frac{4}{3}\right)<\frac{\pi}{4}+\frac{1}{6}$.	K4	CO-3	5M
		ii) Let C be a curve defined parametrically as $x=a\cos^3\theta, y=a\sin^3\theta, 0\le\theta\le\pi/2$. Determine a point P on C, where the tangent to C is parallel to the chord joining the points $(a,0)$ and (o,a).	K4	CO-3	5M
		OR			
	b	i) Obtain the Maclaurin's series expansion of $f(x)=\sin\left(m\sin^{-1}x\right)$, where m is a constant.	K4	CO-3	5M
		ii) Using Taylor's series, obtain the value of $\cos 31°$ correct to four decimal places.	K4	CO-3	5M
		Unit-IV			
5	a	i) If $u=\tan^{-1}\left(\frac{x^3+y^3}{x-y}\right), x\neq y$, show that $x\frac{\partial u}{\partial x}+y\frac{\partial u}{\partial y}=\sin 2u$ and $x^2\frac{\partial^2 u}{\partial x^2}+2xy\frac{\partial^2 u}{\partial x\partial y}+y^2\frac{\partial^2 u}{\partial y^2}=(1-4\sin^2 u)\sin 2u$	K4	CO-4	5M
		ii)If $u=\frac{x+y}{z}, v=\frac{y+z}{x}, w=\frac{y(x+y+z)}{xz}$, show that u,v,w are not independent and find the relation between them.	K4	CO-4	5M
		OR			
	b	i) Find the relative maximum and minimum values of the function $f(x,y)=2(x^2-y^2)-x^4+y^4$.	K4	CO-4	5M
		ii) Divide a number into three parts such that the product of the first, square of the second and cube of the third is maximum.	K3	CO-4	5M
		Unit-V			
6	a	i) Change the order of integration and evaluate the double integral $\int_{y=0}^{1}\int_{x=y}^{\sqrt{2-y^2}}\frac{y}{\sqrt{x^2+y^2}}dxdy$	K3	CO-5	5M
		ii)Find the area bounded by the curves $y=x^2, y=4-x^2$.	K3	CO-5	5M
		OR			
	b	i) Find the volume of the solid in the first octant bounded by the paraboloid $z=36-4x^2-9y^2$.	K3	CO-5	5M
		ii) Find the volume of the solid enclosed between the surfaces $x^2+y^2=a^2$ and $x^2+z^2=a^2$.	K3	CO-5	5M

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

***

NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

I B.Tech I Semester Supple. Examinations, May 2025. **R23**

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	List the characteristics of an algorithm	K1	1	2M
	b	What are the rules for naming an identifier?	K1	1	2M
	c	Compare and contrast the use of "break" and "continue" statements within a loop.	K4	2	2M
	d	Differentiate while loop and do while loop?	K4	2	2M
	e	Define the string and give example.	K1	3	2M
	f	Differentiate 1D and 2D array with an example ?	K4	3	2M
	g	Define the dangling pointer and give example.	K1	4	2M
	h	Define the union and give example.	K1	4	2M
	i	Write the syntax for function prototype, and function call?	K1	5	2M
	j	What is the difference between fseek and rewind in file handling?	K4	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	Explain the various types of operators used in the C programming language, along with suitable examples for each type?	K3	1	10M
		OR			
	b	Explain type conversion and type casting in C programming, highlighting the differences between them with examples.	K3	1	10M
3		Unit-II			
	a	Explain the use of the switch statement in C programming with an example program to demonstrate its functionality.	K3	2	10M
		OR			
	b	Write a C program for the given below pattern using a for loop. 1 1 1 1 2 1 1 3 3 1 1 4 6 4 1	K4	2	10M

4		Unit-III			
	a	Explain any five string handling built-in functions with examples	K3	3	10M
		OR			
	b	Write a C program to perform the multiplication of two matrices using arrays.	K4	3	10M
5		Unit-IV			
	a	Create a program that swaps the values of two variables using call by address in a function.	K4	4	10M
		OR			
	b	Explain the difference between struct and union in C, and write a program to demonstrate their usage with examples	K3	4	10M
6		Unit-V			
	a	Write a C program to demonstrate the difference between pass by value and pass by reference in functions.	K4	5	10M
		OR			
	b	Explain the operations and modes of Files.	K3	5	10M

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

***

NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

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

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	Marks
1	a. Why is the story titled "The Gift of the Magi"?	K3	CO1	2M
	b. What are some common elements you focus on while skimming a text?	K3	CO2	2M
	c. What literary device is primarily used when the brook is speaking as if it were a person?	K3	CO1	2M
	d. The cat jumped ___ the table and knocked ___ the vase. (Fill the blanks with suitable prepositions)	K3	CO3	2M
	e. How does Musk prove himself as a man of vision and embodiment of cutting edge technologies –explain with relevant examples.	K3	CO1	2M
	F. Fill in the blanks with suitable verb forms. 1. She ___ (never/try) sushi before she visited Japan. 2. I ___ (meet) John before, but I don't remember him well.	K3	CO3	2M
	G. What kind of toys does the narrator give to the children?	K3	CO1	2M
	H. Fill the blanks with the correct word. 1. He is always so _____ when he talks about his favorite hobby. (enthusiastic, sad, indifferent) 2. The main _____ of the story is to teach us the value of honesty. (theme, colour, character)	K3	CO4	2M
	I. Why is intrapersonal communication considered important for personal growth?	K3	CO1	2M
	J. Correct the following sentences 1. The group of students were excited for the trip. 2. Neither the cat nor the dogs likes the new food.	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	Marks
		Unit-I			
	a	i) Discuss how Jim and Della's love for each other is demonstrated through their willingness to sacrifice their most prized possessions.	K3	CO1	7M
	a	ii) Rewrite the jumbled sentences in the correct order a. I around me looked b. I went the towards footprint large c. was afraid I now	K3	CO3	3M

		OR			
2	b	1. i) B. Identify the parts of speech for the following sentences. 1. Namitha is not coming today. 2. My mom will be leaving to Bangalore tomorrow. 3. The teacher asked the students to stand. 4. He is my brother. 5. There is a cat under the table.	K3	CO3	5M
		ii) Write the antonyms for the following words. • Admire – • Bravery – • Crooked – • Dainty – • Economise –	K3	CO4	5M
3		Unit-II			
	a	i). What role does nature play in your life or in the lives of those around you? How does Tennyson's depiction of the brook influence your perception of the natural world?	K3	CO1	7M
		ii) Write a short paragraph of 120-150 words on the following topic. "The Role of AI Tools in Personalized Learning for Students"	K6	CO2	3M
		OR			
	b	i) Fill the blanks with suitable articles.	K3	CO3	5M
		a. Do you know _____ answer to _____ question? b. I saw----------eagle fly by c. We need to buy _____ new book for our literature class. d. _____ moon orbits around _____ Earth e. I need _____ umbrella because it looks like it's going to rain.			
		Arrange the following sentences into a systematic and meaningful paragraph: a. On board with Neil Armstrong were Michael Collins and Buzz Aldrin. b. It was July 21, 1969, and Neil Armstrong awoke with a start. c. The journey had begun several days earlier, when on July 16th, the Apollo 11 launched from Earth headed into outer space. d. Upon Neil's first step onto the moon's surface, he declared, "That's one small step for man, one giant leap for mankind." It sure was! e. The crew landed on the moon in the Sea of Tranquillity a day before the actual walk.	K3	CO3	5M
		Unit-III			
		i) Discuss Tesla's influence on the automotive industry and the push towards sustainable energy. Discuss the contribution of Elon Musk.	K3	CO1	7M

	a	ii) Fill in the blanks with either ***be*** or ***have*** in a form that agrees with the subject of the sentence. a. Mathematics_____ an interesting subject b. Do you _____ an umbrella? c. One of my friends----------arrived India just now.	K3	CO3	3M
		OR			
4	b	i) Fill in the blanks with correct forms of the verbs. 1. I __ a letter for my friend. (write/wrote) 2. The friends ___ back from the trip. (drove/drive) 3. Did you ___ anything? (do/done) 4. They ___ till late evening. (plays/played) 5. Can you __ well? (swim/swam)	K3	CO3	5M
		ii) Correct the following sentences 1. Sheldon is brave than his friends. 2. The mans purse was lost in the bus. 3. The boy studied when his father came home from work. 4. Do he have any idea where he is going? 5. Have you ever being to Kerala?	K3	CO3	5M
		Unit-IV			
5	a	i) Summarize the main plot of "The Toys of Peace." What are the key events that drive the story forward?	K3	CO1	7M
		ii) Fill in the blanks with an appropriate word. _____ pollution control measures are expensive, many industries hesitate to adopt them. a. Although b. However c. Because d. Despite It is not _____ for a man to be confined to the pursuit of wealth. a. healthy b. easy c. possible d. _____ his being innocent of the crime, the judge sentenced him to one year imprisonment. a. In spite of b. In case of c. On account of d. In the event of	K3	CO4	3M
		OR			
		i) Write a formal letter applying for the position of Marketing Coordinator at a company you are interested in. Include details about your qualifications, your relevant experience, and why you are a suitable candidate for the position.	K6	CO2	5M

	b	iii) Rewrite the following sentences as directed. a. Gopal wrote a letter (Change to Passive) b. The strawberry pie was eaten by me (Change to Active) c. Maya said 'I am busy now'. (Change to Indirect speech) d. He said that we cannot live without air. (Change to Direct speech) e. "I have been to Boston", she told me. (Change to direct speech)	K3	CO3	5M
6		Unit-V			
		i) Discuss the benefits of effective intrapersonal communication. How can it positively impact your personal and academic life?	K3	CO1	7M
	a	Correct the errors in the following sentences. a. I have went to the store yesterday to buy some groceries. b. The book on the table are mine c. Each of the students have a unique talent	K3	CO3	3M
		OR			
		i). Write an essay on "Learning from the Past: How Historical Lessons Contribute to Nation Building"	K3	CO2	6M
	b	ii) Read the paragraph and answer the given questions. Education is the beginning of empowerment. It is a key to happy and satisfactory life for the special children, who are cruelly segregated from the society. In India, there are around 35 million disabled children but less than one per cent have access to education. The most pressing needed is to bestow the precious gift of education on them and let them be the bearer of torch towards the path of progress Special children, without education, are a burden on their families as well as society. The crude discrimination between normal and abnormal children leads to severe psychological disorders, giving birth to frustration which we all know, is not healthy for any progressing nation. Several NGOs are working towards the upliftment and betterment of such children, but again a grave problem that is faced by the volunteers is lack of motivation in such children and even their families. Those who are form the well-to do families may not find themselves in this menace, but those belonging to the lower economic section feel that the effort to obtain education is simply wastage of time and energy not to say anything about money. Another factor which is hindering the path of education for such children is the lack of opportunities or facilities available in schools. Even if the parents do send such children to school, the schools themselves are sadly lacking the facilities to cater or their needs. The government has started an integrated system of education that enables the disabled to study with normal children in normal circumstances with few facilities for them. Yet again hard mould. Special schools have also been established by the government and NGOs to meet specific needs of such children but their number is pitiably low as compared to the normal schools. There is an urgent need to strike at the roots of their neglect to enable the disabled. (a)Who are special children? (b)Why is education important for 'special children'? (c)What is the hindrance on the path of education for 'special children"? (d) What steps have been taken by the government for the betterment and upliftment of special children?	K3	CO1	4M

NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

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

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	What is the main role of civil engineers in society?	K1	CO1	1M
	b	What are the advantages of chain?	K1	CO1	1M
	c	Write about Types of Highway Pavements.	K1	CO2	1M
	d	What is building planning and construction?	K1	CO2	1M
	e	What is the role of a water resources engineer?	K1	CO3	1M
2		Unit-I			
	a	i) Describe in details the contribution of civil engineering for the welfare of the society?	K2	CO1	10 M
		OR			
	b	i) What are the qualities of a good cement?	K1	CO1	5M
		ii) List the uses of the following construction materials: Aggregates, Bricks.	K2	CO1	5M
		Unit-II			
3	a	i) Summarize the principles of surveying?	K2	CO2	5M
		ii) Calculate the back bearings for the following fore bearings. AB: 80°30', BC: 150°15', CD: 270°20' and DE: 325°30'	K1	CO2	5M
		OR			
	b	i) Explain the classification of surveying?	K2	CO2	5M
		ii) Calculate WCB for the following quadrant bearings. PA: N 15°E, PB: S 25°45' EC: S 45°30' W PD: N 10°W?	K1	CO2	5M
		Unit-III			
4	a	i)what is the Importance of Transportation in Nation's economic development	K2	CO3	5M
		ii) State the components of the flexible pavements. Explain in detailed.	K4	CO3	5M
		OR			
	b	i) Explain about rainwater harvesting and its advantages.	K2	CO4	5M
		ii) What are the various geological considerations for selecting of a reservoir site?	K1	CO4	5M

PART-B

(ME)

Q.No		Questions	KL	CO	M
5	a	Define Composite material.	K2	CO1	1M
	b	Summarize mechanical engineering technology in aerospace sector	K2	CO1	1M
	c	Define casting	K2	CO1	1M
	d	What is the working principle of 4-stroke petrol engine?	K2	CO1	1M
	e	List the mechanical power transmission system	K3	CO1	1M
6		Unit-IV			
	a	i) What is the role of mechanical engineer in the marine industry?	K2	CO2	5M
		ii) What are the engineering ceramic materials? Explain in detailed	K4	CO2	5M
		OR			
	b	i) Summarize the mechanical engineering role in Manufacturing.	K2	CO2	10M
		Unit-V			
7	a	i) What are the advantages and applications of CNC?	K4	CO3	5M
		ii)) Write a short note on 3D printing.	K2	CO3	5M
		OR			
	b	i) Explain the Working of 4-Strokes Diesel Engine with P-V diagram.	K3	CO3	6M
		ii) What are the applications of IC engines?	K2	CO3	4M
		Unit-VI			
8	a	i) With a neat sketch Explain the working of Nuclear power plant.	K4	CO4	5M
		ii) Write about Gear Drives and their applications.	K2	CO4	5M
		OR			
	b	i) What are the applications of robotics.	K4	CO4	5M
		ii) write about Working principle of Steam power plant.	K2	CO4	5M

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

***

NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

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

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	Differentiate between bonding and antibonding orbitals.	2	1	2M
	b	Calculate the bond order of oxygen molecule.	2	1	2M
	c	What are type-II superconductors?	1	2	2M
	d	What is the principle involved in zone refining process?	1	2	2M
	e	What is an electrochemical cell?	1	3	2M
	f	Write the anodic and cathodic equations of zinc-air battery.	1	3	2M
	g	What are thermosetting plastics? Give examples.	1	4	2M
	h	Define step growth polymerization.	2	4	2M
	i	Mention the wavelength range of UV-visible and IR spectra.	1	5	2M
	j	Identify $n \rightarrow \pi^*$ transition in UV electronic transition spectrum	2	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) Explain conditions for linear combination of atomic orbitals.	2	1	5M
		ii) Draw and explain pi-molecular orbital energy level diagram of benzene.	3	1	5M
		OR			
	b	i) Explain molecular orbital diagram for heteronuclear diatomic molecule taking one example.	2	1	5M
		ii) Discuss types of hydrogen bonding.	2	1	5M
3		Unit-II			
	a	i) Explain czochralski process for preparation of semiconductors.	2	2	5M
		ii) Discuss the classification of super capacitors.	2	2	5M
		OR			
	b	i) Explain laser ablation method for preparation of carbon nanotubes.	2	2	5M
		ii)Discuss applications of fullerenes and graphene nanoparticles.	2	2	5M
4		Unit-III			
	a	i) Explain conductometric titration of weak acid and strong base.	2	3	5M
		ii) Explain construction and working of fuel cell.	3	3	5M
		OR			
	b	i) Discuss the working of potentiometric sensor.	2	3	5M
		ii) Explain the construction and working of lithium ion battery.	3	3	5M

5		Unit-IV			
	a	i) Explain coordination polymerization.	2	4	5M
		ii) Explain preparation and properties of BUNA-S.	2	4	5M
		OR			
	b	i) Discuss conducting polymers.	2	4	5M
		ii) Discuss mechanism of free radical addition polymerization.	2	4	5M
		Unit-V			
	a	i) Explain instrumentation of NMR.	2	5	5M
		ii) Discuss applications of UV spectroscopy.	2	5	5M
		OR			
	b	i) Discuss instrumentation of IR spectrophotometer. Mention its applications.	2	5	5M
		ii) Explain Beer Lamberts Law.	2	5	5M

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

***

NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

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

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 four properties of laser radiation.	K1	1	2M
	b	Draw the basic structure of optical fiber and describe different layers.	K1	1	2M
	c	Define Primitive and Non-primitive cells. Give examples.	K2	2	2M
	d	Discuss the importance of Miller indices.	K2	2	2M
	e	How superconductors are differed from conductors.	K1	3	2M
	f	Describe the relation between B, M and H.	K1	3	2M
	g	Mention any four merits of classical free electron theory.	K2	4	2M
	h	State any four significant properties of wave function.	K2	4	2M
	i	Draw the energy band diagram of intrinsic and extrinsic semiconductor indicating Fermi, valence band and conduction band energy levels.	K2	5	2M
	j	Mention 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	M
2		Unit-I			
	a	i) Discuss the construction and working of He-Ne laser.	K3	1	5M
		ii)Derive the Einstein's coefficients relating the intensity of radiation with matter. Discuss its outcomes.	K2	1	5M
		OR			
	b	i) Derive an expression for numerical aperture of an optical fiber.	K3	1	5M
		ii) Discuss the construction of step index and graded index fibers. Explain the propagation of light through these fibers.	K2	1	5M
3		Unit-II			
	a	i) Derive the atomic packing factor of FCC and BCC systems.	K2	2	5M
		ii) What are Bravais lattices? Discuss various lattices based on unit cell parameters.	K2	2	5M
		OR			
	b	I) State and explain Bragg's law. How this helps in the determination of crystal structure.	K3	2	5M
		ii) Discuss the crystal structure determination using powder diffraction method.	K3	2	5M
4		Unit-III			
	a	i) Differentiate magnetic materials based on the properties of hysteresis loop	K3	3	5M

		observed in Ferromagnetic materials.			
		ii) Describe the origin of permanent magnetism based on atomic model.	K2	3	5M
		OR			
	b	i) Distinguish Type-I and Type-II superconductors with examples.	K2	3	5M
		ii) Discuss the postulates of BCS theory.	K2	3	5M
5		Unit-IV			
	a	i) Derive the Schrodinger time independent wave equation. Discuss its significance.	K2	4	10 M
		OR			
	b	i) Derive the electrical conductivity of metals based on free electron theory of metals.	K2	4	10 M
6		Unit-V			
	a	i) State and Explain Hall effect. Obtain the relation between Hall coefficient and Hall voltage.	K3	5	10 M
		OR			
	b	i) Describe the properties of piezoelectric and chromic materials.	K2	5	10 M

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

***

NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

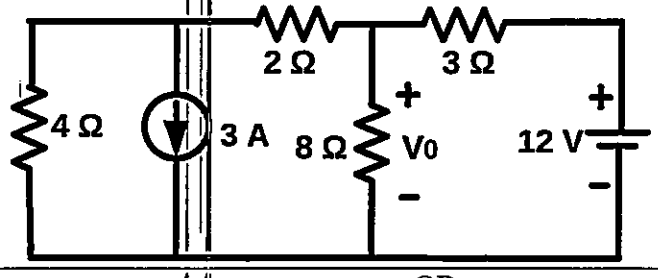
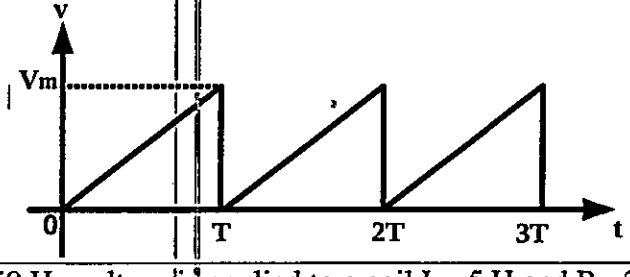
I B.Tech I Semester Supple. Examinations, May-2025

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

Q.No		Questions	KL	CO	M
1	a	What are the limitations of superposition theorem?	K1	1	1M
	b	What is the purpose of yoke in DC generator?	K1	2	1M
	c	Differentiate earthing and grounding in electrical installations.	K1	3	1M
	d	Explain about bilateral and nonlinear elements	K1	1	1M
	e	Explain about core type transformer.	K1	2	1M
2		Unit-I			
	a	i)Explain Ohms law and list out its limitations.	K2	1	5M
		ii) Find the value of voltage Vo from the **Figure** shown below. 	K3	1	5M
		OR			
	b	i) Determine the form factor and peak factor of the waveform shown below. 	K3	1	5M
		ii) A 230 V, 50 Hz voltage is applied to a coil L= 5 H and R= 2 Ω is in series with a capacitance C. What value must C have in order that the voltage across the coil be 400 V?	K3	1	5M
3		Unit-II			
	a	I) Explain the construction of DC Generators with the help of neat diagram.	K2	2	5M
		ii)Explain the working prindiple of a single-phase transformer with a neat sketch	K3	2	5M
		OR			
	b	i)Explain the Construction and working principle of Permanent Magnet Moving Coil instruments.	K2	2	5M
		ii)What is the purpose of Wheat Stone bridge? explain it with a neat sketch.	K2	2	5M
4		Unit-III			
	a	i)Differentiate Conventional and non-conventional energy resources.	K2	3	5M
		ii) With the aid of diagram explain the nuclear power generation.	K3	3	5M
		OR			
	b	i)What is meant by tariff and explain about two-part tariff.	K2	4	5M
		ii)What is the difference between fuse and circuit breaker and briefly discuss about Miniature circuit breaker.	K3	4	5M

PART-B

Q.No		Questions	KL	CO	M
5	a	What is meant by Zener effect?	K1	1	1M
	b	What is the purpose of amplifier?	K1	2	1M
	c	List the different types of flip-flops.	K1	3	1M
	d	Draw the forward characteristic so BJT.	K1	1	1M
	e	List the applications of full adders.	K2	3	1M
6		Unit-IV			
	a	i) With a neat diagram, explain the characteristics of Zener diode.	K2	1	5M
		ii) Explain the working of a PN junction diode in forward bias and reverse bias.	K2	1	5M
		OR			
	b	i) Sketch the input and output characteristics of CB configuration and explain them in brief.	K2	1	5M
		ii)Differentiate CE, CC and CB configurations.	K2	1	5M
		Unit-V			
7	a	i) Clearly explain the block diagram description of a dc power supply.	K2	2	5M
		ii)Explain the operation of a full wave bridge rectifier.	K2	2	5M
		OR			
	b	i) With the help of block diagram explain the Public Address system.	K2	2	5M
		ii)Explain the working of common emitter (RC coupled) amplifier along with its frequency response.	K2	2	5M
		Unit-VI			
8	a	i)Explain NOT, OR, AND, NOR, NAND gates along with its truth tables.	K2	3	5M
		ii) Explain the J-K flip flop using its truth table.	K2	3	5M
		OR			
	b	i) Design and implement the full adder with truth table.	K2	4	5M
		ii) Explain the Ring Counter with the help of diagram.	K2	4	5M

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

***

NEC NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

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

R23

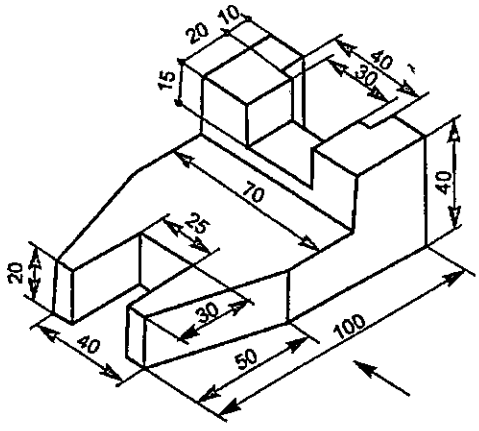
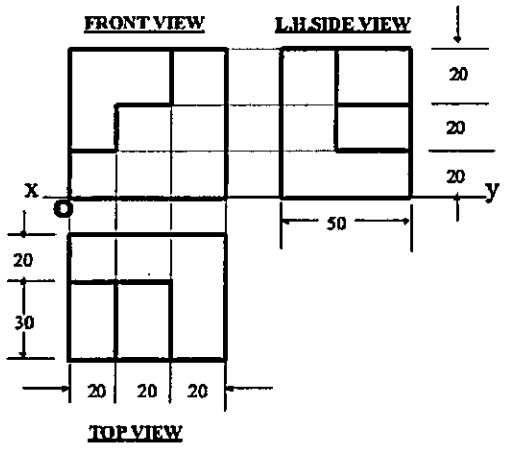
Sub Code: R23CC1108 **ENGINEERING GRAPHICS**

Time: 3 hours (CE, EEE, ME, ECE, 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	The distance between vertex and directrix is 65mm and e=2/3. Draw the curve and also draw the tangent and normal 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, 60 mm long, is inclined at 45^0 to the H.P. and its top view makes an angle of 50^0 with the V.P. The end A is in the H.P. and 20 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 semicircular plate of 60 mm diameter has its straight 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.	K4	CO2	14M
3		Unit-III			
	a	A cone 40 mm diameter and 50 mm axis is resting on one generator on HP Draw its projections.	K3	CO3	14M
		OR			
	b	A square pyramid, base 40 mm side and axis 90 mm long, has a triangular face on the ground and the vertical plane containing the axis makes an angle of 45^0 with the VP. Draw its projections.	K4	CO3	14M
4		Unit-IV			
	a	A hexagonal 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.	K4	CO4	14M
		OR			
	b	A hexagonal prism of base side 30 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 meets the axis at a distance of 20 mm above the base. Draw the	K4	CO4	14M

		development of the lateral surfaces of the lower portion of the prism.			
5		Unit-V			
	a	Draw the (i) Front view (**Marked as 'arrow'**) (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

***