MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)

B. Tech I Year I Semester (R23) Regular & Supplementary End Semester Examinations, January– 2025

LINEAR ALGEBRA AND CALCULUS
(Common to All)

Time: 3Hrs   Max Marks: 70

> Attempt all the questions. All parts of the question must be answered in one place only.
> **All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only**

Q.No		Question	Marks	CO	BL
Q.1	i.	For what values of P the following set of equations have infinite number of solutions $x + 2y = 5;\ 3x + Py = 15$.	1M	1	2
	ii.	If $A = \begin{bmatrix} 10 & 4k+5 \\ 3k-3 & k+5 \end{bmatrix}$ is a symmetric matrix then determine the value of k.	1M	1	1
	iii.	If $A = \begin{bmatrix} 1 & 3 \\ 4 & 2 \end{bmatrix}$ and has eigenvalues 5 and -2 then find the eigenvalues of $B = A^3 - 4A^2 - 2A$.	1M	2	2
	iv.	Find rank, index and signature of the quadratic form $x^2 - y^2 + 3z^2$ by using eigenvalues.	1M	2	2
	v.	State Cauchy's mean value theorem	1M	3	1
	vi	State Taylor's series formula for $f(x)$ about $x = a$	1M	3	1
	vii.	Find the first order derivatives of $f(x, y) = e^{3x} \sin(2y)$	1M	4	2
	viii.	If $x = r\cos\theta$, $y = r\sin\theta$, Evaluate $\dfrac{\partial(x, y)}{\partial(r, \theta)}$	1M	4	2
	ix.	Write the equivalent integral of $\int\limits_{0}^{6}\int\limits_{0}^{y} x\,dx\,dy$ by the change of order of integration	1M	5	2
	x.	Write the equations that relates Cartesian Coordinates and Spherical Coordinates	1M	5	1
Q.2(A)		(i). Reduce the matrix, $A = \begin{bmatrix} -2 & 1 & -1 & -1 & 3 \\ 3 & 1 & -4 & -2 & -4 \\ 7 & 1 & -6 & -2 & -3 \\ -8 & -1 & 6 & 2 & 3 \\ -3 & 0 & 2 & 1 & 2 \end{bmatrix}$ to Echelon form and hence find the rank.	6M	1	3
		(ii). Test for consistency and solve the system $5x + 3y + 7z = 4;\ 3x + 26y + 2z = 9;\ 7x + 2y + 10z = 5$ (if exists)	6M	1	3

OR

Q.2(B)	Solve the system $5x + 2y + z = 12;\ x + 4y + 2z = 15;\ x + 2y + 5z = 20$ by Gauss- Seidel iteration method	12M	1	3

Q.3(A)   Reduce the matrix $A = \begin{bmatrix} 5 & -4 & 4 \\ 12 & -11 & 12 \\ 4 & -4 & 5 \end{bmatrix}$ to the diagonal form by specifying   12M   2   3

the modal matrix.

OR

Q.3(B)   Verify Cayley-Hamilton theorem, find the Inverse and A^4 of the matrix   12M   2   3

$A = \begin{bmatrix} 1 & 1 & 3 \\ 1 & 3 & -3 \\ -2 & -4 & -4 \end{bmatrix}$

Q.4(A)

(i). Verify Rolle's theorem for $f(x) = e^x(\sin x - \cos x)$ in $\left(\dfrac{\pi}{4}, \dfrac{5\pi}{4}\right)$ 6M   3   3

(ii). Prove that $\dfrac{b-a}{1+b^2} < \tan^{-1} b - \tan^{-1} a < \dfrac{b-a}{1+a^2}$ and hence deduce that   6M   3   3

$\dfrac{\pi}{4} + \dfrac{3}{25} < \tan^{-1}\left(\dfrac{4}{3}\right) < \dfrac{\pi}{4} + \dfrac{1}{6}$.

OR

Q.4(B)   (i). Expand $\log(\sec x)$ by Maclaurin's series up to the term containing   6M   3   3

x^6

(ii). Expand $e^x \sin x$ by Maclaurin's series up to the term containing x^6 6M   3   3

Q.5(A)   (i).   If $r^2 = x^2 + y^2 + z^2$ and $V = r^m$,   show   that   6M   4   3

$V_{xx} + V_{yy} + V_{zz} = m(m+1)r^{m-2}$

(ii). If $u = x + y + z$, $uv = y + z$, $uvw = z$, then evaluate $\dfrac{\partial(x, y, z)}{\partial(u, v, w)}$ 6M   4   3

OR

Q.5(B)   Discuss the extreme values for $f(x, y) = x^3 + 3xy^2 - 15x^2 - 15y^2 + 72x$ 12M   4   3

Q.6(A)

(i). Change the order of Integration, $I = \int\limits_{0}^{1}\int\limits_{x}^{\sqrt{x}} xy\,dy\,dx$ and hence evaluate   6M   5   3

(ii). Evaluate $\int\limits_{0}^{2}\int\limits_{0}^{\sqrt{4-y^2}} (x^2 + y^2)\,dx\,dy$ by changing into polar coordinates   6M   5   3

OR

Q.6(B)

(i). Evaluate $\int\limits_{-c}^{c}\int\limits_{-b}^{b}\int\limits_{-a}^{a} (x^2 + y^2 + z^2)\,dx\,dy\,dz$ 6M   5   3

(ii). Changing into cylindrical coordinates, evaluate $\iiint\limits_{D} z(x^2 + y^2)\,dx\,dy\,dz$ 6M   5   3

$D: x^2 + y^2 \le 1, 2 \le z \le 3$

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B. Tech I Year I Semester (R23) Regular & Supplementary End Semester Examinations, January– 2025
CHEMISTRY
(Common to CST, AI, DS and CS)

Time: 3Hrs   Max Marks: 70

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

Q.No		Question	Marks	CO	BL
Q.1	i.	Draw the HOMO of 1,3-Butadiene	1M	1	2
	ii.	Write the significance of ψ^2.	1M	1	1
	iii.	List out the classifications of Super capacitor.	1M	2	1
	iv.	Define doping.	1M	2	1
	v.	Standard reduction potential of Cd|Cd^{2+} and Pb|Pb^{2+} electrodes are -0.408 volts and -0.126 volts respectively. State whether the following cell setup is feasible or not. Give reason. $Cd\|Cd^{2+} \| Pb^{2+} \| Pb$	1M	3	2
	vi	Give any two applications of potentiometric sensors	1M	3	1
	vii.	Explain functionality of monomers with example.	1M	4	2
	viii.	Illustrate the advantages of vulcanizing natural rubber.	1M	4	2
	ix.	Which spectroscopy is based upon the transitions involving the vibrational degrees of freedom of the molecule?	1M	5	2
	x.	Why absorbance (A) has no unit?	1M	5	2
Q.2(A)	i).	Write the three-dimensional Schrodinger wave equation. Derive the expression for energy of a particle moving in a one-dimensional box.	8M	1	2
	ii).	State Heisenberg's uncertainty principle. Calculate the uncertainty in the position of an electron of mass 9.1×10^{-28}g moving with a velocity of 1.0×10^4 cms^{-1} with an accuracy of 0.011%.	4M	1	2
		OR			
Q.2(B)		Discuss the salient features of Molecular orbital theory and explain the molecular orbital diagram for O_2 and NO molecule and calculate the bond order.	12M	1	2
Q.3(A)		Explain the super conductivity in solids by applying BCS theory. Give the applications of superconductors.	12M	2	3
		OR			
Q.3(B)	a).	How the nano materials are classified? Explain.	6M	2	2
	b).	Explain the properties and applications of carbon nano tubes.	6M	2	2
Q.4(A)	(i)	Derive Nerst equation.	6M	3	2
	(ii)	Apply the Nernst equation for the following cell and calculate the EMF. Give the cell representation and write the electrode reactions for the cell. (E^0_{Cell} = 1.05V). $Ni(s) + 2Ag^+_{(0.002M)} \longrightarrow Ni^{2+}_{(0.160M)} + 2Ag$	6M	3	3
		OR			
Q.4(B)	i).	Demonstrate the construction and working of Li-ion battery during charging and discharging.	6M	3	3
	ii).	Describe the construction and working of H_2-O_2 fuel cell.	6M	3	2

Q.5(A)	i). Differentiate between addition polymerization and condensation polymerization.	6M	4	2
	ii). Illustrate the mechanism of co-ordination polymerization.	6M	4	2

OR

Q.5(B)	Explain the preparation, properties and applications of (i) Nylon-6,6 (ii) Buna-S	12M	4	2
Q.6(A)	i). Explain the instrumentation of HPLC and give applications of HPLC	6M	5	2
	ii). Describe the different fundamental modes of vibration in IR spectroscopy	6M	5	2

OR

Q.6(B)	Illustrate the principle, instrumentation and applications of UV-Visible spectroscopy?	12M	5	2

*** **END** ***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)

B. Tech I Year I Semester (R23) Regular & Supplementary End Semester Examinations, January– 2025

ENGINEERING CHEMISTRY
(Common to CE and ME)

Time: 3Hrs   Max Marks: 70

> Attempt all the questions. All parts of the question must be answered in one place only.
> **All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only**

Q.No		Question	Marks	CO	BL
Q.1	i.	Define Reverse Osmosis (RO).	1M	1	1
	ii.	Differentiate priming & foaming.	1M	1	2
	iii.	Write Nernst equation.	1M	2	2
	iv.	State Pilling Bedworth rule.	1M	2	2
	v.	Name the monomers used in PVC.	1M	3	1
	vi	Define octane number.	1M	3	1
	vii.	What is setting process in cement?	1M	4	1
	viii.	Give any two examples for composites.	1M	4	1
	ix.	Write the BET equation	1M	5	1
	x.	Define nanomaterial with an example.	1M	5	1
Q.2(A)		Discuss ion exchange process for purification of water with a neat sketch.	12M	1	2
		OR			
Q.2(B)		Discuss the principle, procedure and calculations involved in estimation of dissolved oxygen in water.	12M	1	2
Q.3(A)		Define secondary battery. Discuss the working principle, cell reactions and applications of Li-ionbattery.	12M	2	3
		OR			
Q.3(B)		Briefly describe the factors affecting rate of corrosion	12M	2	2
Q.4(A)		Explain the preparation, properties and applications of Buna -S & Buna – N synthetic rubbers.	12M	3	2
		OR			
Q.4(B)		Discuss the proximate & ultimate analysis of coal sample in detail.	12M	3	3
Q.5(A)		Explain in detail the properties of lubricating oils.	12M	4	2
		OR			
Q.5(B)		Illustrate the manufacturing process of Portland cement in details.	12M	4	2
Q.6(A)		i) Explain any one chemical method for preparation of nanomaterial	6 M	5	2
		ii) Illustrate the process of micelle formation with diagrams.	6 M	5	2
		OR			
Q.6(B)		Explain Langmuir adsorption isotherm	12M	5	3

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)

B. Tech I-I (R23) Regular, I &II Supplementary End Semester Examinations, January– 2025

ENGINEERING PHYSICS
(Common to All)

Time: 3Hrs

Max Marks: 70

> Attempt all the questions. All parts of the question must be answered in one place only.
> **All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only**

Q.No		Question	Marks	CO	BL
Q.1	i.	What causes colors in thin films?	1M	1	1
	ii.	What is the role of a Nicol's prism in polarization?	1M	1	1
	iii.	Name two methods for determining crystal structure.	1M	2	1
	iv.	State Bragg's law.	1M	2	1
	v.	Write the mathematical form of Heisenberg's Uncertainty Principle.	1M	3	1
	vi	Calculate the de Broglie wavelength of an electron moving with a velocity $v=10^6 \, \text{m/s}$	1M	3	2
	vii.	Define the Fermi level.	1M	4	1
	viii.	How does Fermi energy depend on temperature?	1M	4	1
	ix.	What is dielectric polarization?	1M	5	1
	x.	Define magnetic susceptibility.	1M	5	1
Q.2(A)		(i) Define Newton's rings. Demonstrate the formation of bright and dark fringes in Newtons Rings experiment with neat diagram and determine the wavelength of incident monochromatic light used.	9M	1	3
		(ii)In a Newton's rings setup, the radius of the 5th ring is 1.2 mm. If the wavelength of light used is 589 nm, calculate the radius of the 3rd ring.	3M	1	3
		OR			
Q.2(B)		(i) Discuss the phenomenon of polarization and explain the types of polarization. Describe polarization by reflection, refraction, and double refraction.	10M	1	2
		(ii) Calculate the Brewster's angle for light passing from air (n = 1) into glass (n = 1.5)	2M	1	3
Q.3(A)		(i) Derive the packing fraction formula for a Body-Centered Cubic (BCC) lattice and show the calculation for BCC crystals.	8M	2	2
		(ii) If the atomic radius of an FCC crystal is 0.14 nm, calculate its packing fraction and compare it with that of BCC and SC crystals.	4M	2	2
		OR			
Q.3(B)		(i) Explain the powder method of X-ray diffraction.	9M	2	2
		(ii) A powder sample of an unknown material gives a diffraction peak at $2\theta = 50°$. Given that the X-ray wavelength used is 0.154 nm, calculate the interplanar spacing corresponding to this peak.	3M	2	2
Q.4(A)		(i) Derive Schrodinger's time-independent wave equation and explain the physical significance of the wave function.	8M	3	3
		(ii) A particle of mass 9.1×10^{-31} kg is confined in a one-dimensional box of width 2×10^{-10} m. Calculate the energy of the particle in its first excited state	4M	3	3
		OR			
Q.4(B)		(i) Compare and contrast the classical free electron theory and quantum free electron theory. Highlight their merits and demerits.	8M	3	2
		(ii) Calculate the Fermi energy of a free electron gas at absolute zero temperature if the density of conduction electrons is $8.5 \times 10^{28} \text{m}^{-3}$.	4M	3	3
Q.5(A)		(i) Explain the formation of energy bands in crystalline solids. Classify the solids i.e, conductor, semiconductors and insulators based on the energy band theory.	9M	4	4

	(ii) A semiconductor material has an energy gap (Eg) of 1.1 eV. Calculate the wavelength of light required to excite an electron from th band to the conduction band. (Planck's constant, h=6.63×10⁻³⁴ J·s; Spee c=3×10⁸ m/s).	3M	4	3

OR

Q.5(B)	(i) Deduce an expression for the Hall voltage in a semiconductor. Discuss how the Hall effect is used to determine the type of semiconductor (n-type or p-type).	9M	4	4
	(ii) In a Hall effect experiment, a sample has a Hall coefficient (R_H) of $3.6×10^{-4}$ m³. If the magnetic field is 0.2 T and the current density is 100 A/m², calculate the Hall voltage.	3M	4	4

Q.6(A)	(i) Using the Clausius-Mossotti equation infer the relationship between the dielectric constant and molecular polarizability. Derive the equation and discuss its implications for the macroscopic properties of dielectric materials.	9M	5	4
	(ii) Calculate the polarizability of an atom given the dielectric constant of the material is 2.5, and the number of atoms per unit volume is $2.5×10^{28}$ atoms/m³.	3M	5	4

OR

Q.6(B)	(i) Analyze ferromagnetic hysteresis based on magnetic domains theory and diagrammatically illustrate the process.	10M	5	4
	(ii) For a given ferromagnetic material, the magnetic flux density (B) is 1.2 T, and the applied magnetic field (H) is 1000 A/m. Calculate the magnetization (M) and the magnetic susceptibility (χ_m).	2M	5	3

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B. Tech I Year I Semester (R23) Regular, I & II Supplementary End Semester Examinations, January– 2025
BASIC CIVIL & MECHANICAL ENGINEERING
(Common to All)

Time: 3Hrs   Max Marks: 70

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 4 answer either A or B only

PART-A: BASIC CIVIL ENGINEERING   Max Marks: 35

Q.No		Question	Marks	CO	BL
Q.1	i.	List various disciplines of Civil Engineering.	1M	1	1
	ii.	What are the ingredients of concrete?	1M	1	1
	iii.	Write the definition of Magnetic Bearing.	1M	2	1
	iv.	Differentiate between Plane Surveying and Geodetic Surveying.	1M	2	1
	v.	Write the different types of Harbour.	1M	3	1
Q.2(A)		Explain the any five disciplines of Civil Engineering and their scope in detail.	10M	1	2
		OR			
Q.2(B)		What are the different types of cement and explain in detail?	10M	1	2
Q.3(A)		Explain about levelling instruments used for levelling.	10M	2	2
		OR			
Q.3(B)		The following readings were taken with 4m staff by Auto level. Given by BM = 100 m. The instrument is shifted after 5th and 9th readings. 1.532, 2.015, 2.302, 1.635, 1.313, 2.210, 2.416, 1.012, 2.642, 1.125, 2.126, 1.902. prepare a page of level book and calculate RL of all the Points. Use Rise and Fall Method. Apply Arithmetical check.	10M	2	3
Q.4(A)		Write the advantages and disadvantages of Flexible Pavements.	10M	3	2
		OR			
Q.4(B)		Describe the sources, quality and specification of drinking water.	10M	3	2

*** END***

PART-B: BASIC MECHANICAL ENGINEERING   Max Marks: 35

Q.No		Question	Marks	CO	BL
Q.1	i.	Differentiate between alloy and composite.	1M	1	1
	ii.	What is meant by ferrous metals?	1M	1	1
	iii.	Write any one principle of casting.	1M	2	1
	iv.	What is the difference between IC and EC engines?	1M	2	1
	v.	Write any one application of Rope drives.	1M	3	1
Q.2(A)		Discuss the role of mechanical engineering in aerospace sectors.	10M	1	2
		OR			
Q.2(B)		Write the properties and applications of ceramics.	10M	1	2
Q.3(A)		Discuss the principle of casting process along with neat sketch.	10M	2	2
		OR			
Q.3(B)		Explain the basic working principle of boilers in thermal engineering.	10M	2	3
Q.4(A)		Discuss the Gear Drives in detail.	10M	3	2
		OR			
Q.4(B)		Explain the principle of hydel electric power plant.	10M	3	2

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B. Tech I-I (R23) Regular, I & II Supplementary End Semester Examinations, January – 2025
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
(Common to All)

Time: 3Hrs   Max Marks: 70

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 4 answer either A or B only

PART-A: BASIC ELECTRICAL ENGINEERING   Max Marks: 35

Q.No		Question	Marks	CO	BL
Q.1	i.	In superposition theorem, when we consider the effect of one Voltage source, all the other Voltage sources are .... a) Shorted b) Opened c) Removed d) Undisturbed	1M	1	1
	ii.	What are the advantages of parallel circuits?	1M	1	1
	iii.	Define Motor.	1M	2	1
	iv.	For what purpose wheat stone bridge is used.	1M	2	1
	v.	Define two-part tariff.	1M	3	1
Q.2(A)		Two resistors are connected in series across a 24V supply and the current of 3A flows in the circuit. If one of the resistors has a resistance of 2Ω. Determine the following: i) the value of the other resistor ii) the potential difference across the 2Ω resistor iii) the circuit is connected for 50 Hours; how much energy is used?	10M	1	2
		OR			
Q.2(B)		A series circuit of resistance 80Ω and inductance 95mH is connected to a 220V, 50Hz supply. Calculate (a) reactance, (b) Impedance, (c) Current taken from the Supply (d) phase angle between supply voltage and current, (e) power dissipated.	10M	1	2
Q.3(A)		Explain the construction and working of single-phase transformer with diagram.	10M	2	2
		OR			
Q.3(B)		Explain how the unknown resistance value is calculated by using wheat stone bridge.	10M	2	2
Q.4(A)		Draw the layout of Solar power plant and explain the components associated with the power plant.	10M	3	2
		OR			
Q.4(B)		With neat sketch, explain the working principle of Miniature circuit breaker.	10M	3	2

*** END***

Q.No		Question	Marks	CO	BL
Q.1	i.	Define doping.	1M	1	1
	ii.	Draw the VI characteristics for PN Junction diode.	1M	1	1
	iii.	Write some applications of zener diode.	1M	2	1
	iv.	Convert $(1111101001011100)_2$ to hexa-decimal equivalent	1M	3	1
	v.	Write the truth table for OR gate.	1M	3	1
Q.2(A)		Explain in detail the operation of a PN junction diode in forward and reverse bias conditions with the relevant V-I characteristics.	10M	1	2
		OR			
Q.2(B)		With neat sketch, explain the input and output characteristics of Common Base configuration.	10M	1	2
Q.3(A)		Briefly explain about the operation of zener voltage regulator with circuit diagram.	10M	2	2
		OR			
Q.3(B)		Draw the block diagram of public address system and explain each block.	10M	2	
Q.4(A)		Design a Half adder & Full adder circuit using Logic gates and verify the truth table.	10M	3	3
		OR			
Q.4(B)		Draw the circuit diagram of a JK type flip-flop and explain its operation with the help of a truth table.	10M	3	2

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B. Tech I Year I Semester (R23) Regular & Supplementary End Semester Examinations, January– 2025

INTRODUCTION TO PROGRAMMING

(Common to All)

Time: 3Hrs   Max Marks: 70

> Attempt all the questions. All parts of the question must be answered in one place only.
> **All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only**

Q.No		Question	Marks	CO	BL
Q.1	i.	List the characteristics of Algorithm.	1M	1	1
	ii.	Write any two differences between compiler and interpreter.	1M	1	1
	iii.	Write the syntax of do-while statement in C.	1M	2	1
	iv.	What is the use of continue statement.	1M	2	1
	v.	Define array. List different types of arrays in C.	1M	3	1
	vi	Write the structure of string in C.	1M	3	1
	vii.	What are the uses of pointers.	1M	4	1
	viii.	What do you mean by Dynamic memory allocation. How it is different from Static memory allocation.	1M	4	2
	ix.	Define Recursion.	1M	5	1
	x.	What are various parameter passing techniques available in C.	1M	5	2
Q.2(A)		Illustrate the basic organization of a computer system and its components with neat sketch.	12M	1	3
		OR			
Q.2(B)		Define Operator. List and explain various operators available in C with examples.	12M	1	2
Q.3(A)		Illustrate the various looping statements with suitable example.	12M	2	3
		OR			
Q.3(B)		Write a C program to input 5 subject marks of a student, calculate average and determine the student grade based on the following criteria: • Average between 91 and 100 will receive an 'Outstanding Grade'. • Average between 81 and 90 will receive an 'A Grade'. • Average between 71 and 80 will receive a 'B Grade'. • Average between 61 and 70 will receive a 'C Grade'. • Average between 50 and 60 will receive a 'D Grade'. • Average between 0 and 49 will receive a 'Fail'.	12M	2	3
Q.4(A)		Design and implement a program in C to declare, initialize, and perform matrix multiplication using two-dimensional arrays	12M	3	3
		OR			
Q.4(B)		Define String. How to declare, access and initialize a String in C. Write a C program to find the reverse of a string without using built-in functions.	12M	3	2
Q.5(A)		Compare Structure and Union. Define a structure called student that would contain name, regno and marks of five subjects and percentage. Write a program to read the details of name, regno and marks of five subjects for 30 students, calculate the percentage and display the name, regno, marks of the subjects and percentage of each student.	12M	4	3
		OR			
Q.5(B)		Demonstrate the differences between malloc() and calloc() by explaining their functionality and behaviour. Write a C program to show how realloc() can be used to dynamically resize memory for an array with suitable example.	12M	4	2
Q.6(A)		Identify the different types of functions with respect to different return type and arguments and explain all types with syntax and example.	12M	5	3
		OR			
Q.6(B)		What is a file? List the different file opening modes in C? Develop a C program to copy from one file to another file.	12M	5	3

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)

B. Tech (R23) I-I Regular, I & II Supplementary End Semester Examinations, January – 2025

COMMUNICTIVE ENGLISH
(Common to All)
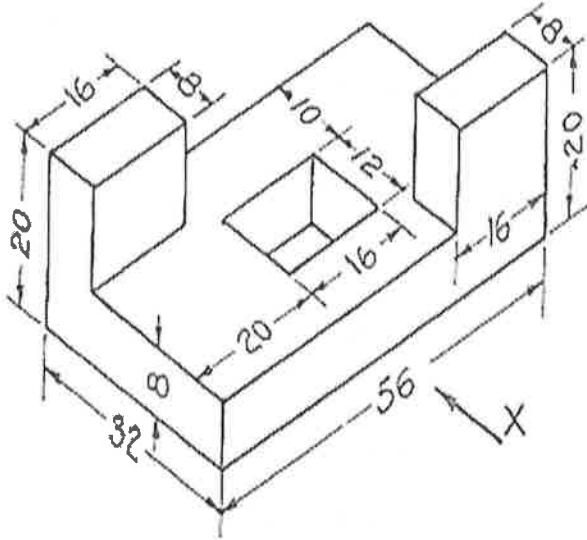
Time: 3Hrs   Max Marks: 70

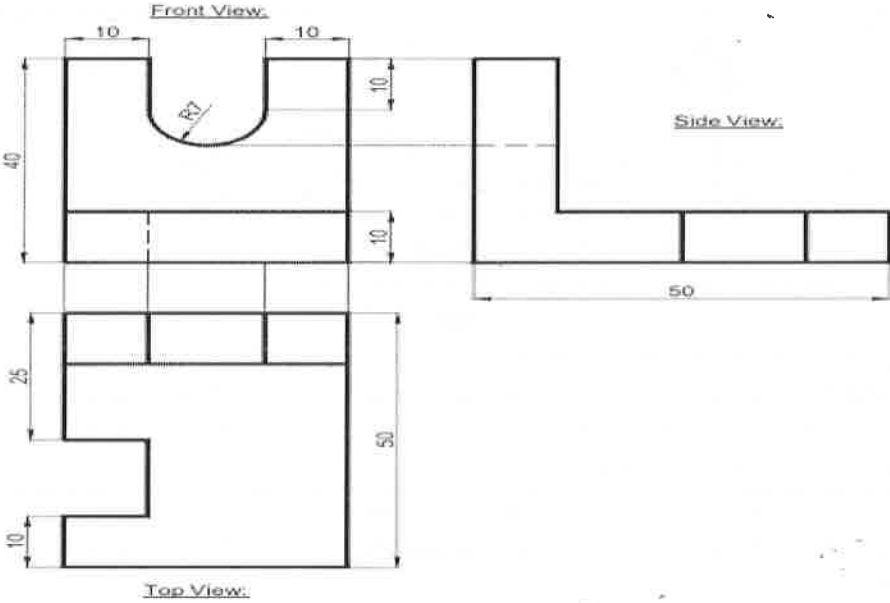> Attempt all the questions. All parts of the question must be answered in one place only.
> **All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only**

Q.No		Question	Marks	CO	BL
Q.1	i.	Define Paraphrasing.	1M	1	2
	ii.	Write the compound word for Brain.	1M	1	1
	iii.	Rewrite the jumbled sentences in the correct order. Ringing a man the doorbell is.	1M	2	1
	iv.	Rewrite the following sentence in passive voice. The police have arrested a thief. (begin the sentence with 'a thief').	1M	2	1
	v.	Rewrite the following sentence in indirect speech. He said to you, "what is the price of this tray".	1M	3	1
	vi	Correct the errors in the following sentence. It is raining since yesterday.	1M	3	1
	vii.	Define scanning.	1M	4	1
	viii.	Fill in the blanks using the appropriate article (a/an/the). (write "no article" if no article is required) He is --------- actor.	1M	4	1
	ix.	Fill in the blanks with the correct forms of the verbs. Were you ....(pay) attention to what was being said.	1M	5	1
	x.	Fill in the blanks using appropriate preposition. The weather is cold-------------- January.	1M	5	1
Q.2(A)		Write an essay on "One Nation One Election".	12M	1	4
		OR			
Q.2(B)		Describe the expectations of Eleanor Bope and Harvey.	12M	1	4
Q.3(A)		Construct a conversation between a doctor and a patient (More than 10 dialogues).	12M	2	3
		OR			
Q.3(B)		How do you define the unconditional love between Jim and Della?	12M	2	3
Q.4(A)		Write a formal letter to the Vice President of Kia Motors, Ms. Gina Thomas, requesting her to be the Chief Guest for the technical symposium organized by the institute by using the correct format.	12M	3	3
		OR			
Q.4(B)		Fill in the blanks with appropriate forms of verb given in the brackets. 1. She is ---------- dinner right now. (cook, cooking, cooked) 2. They ----------Paris last summer. (visit, visited, visits) 3. Neither Ravi nor Naveen _____ present there. (Was/ were). 4. By next year, he will ---------- from college. (have graduated, graduate) 5. Most of the people in India _____ (are/is) poor. 6. One of my friends always _____ (speak/speaks) truth. 7. I _____ (will hit, hit, hitting) you if you say that answer again. 8. There are full of clouds in the sky, it is going to _____ (rain, rains) very soon.	12M	3	2

9. He ------------------------------(present, presented, has presented) a
research paper in the International Conference yesterday.
10. He----------to the park every day. (goes, go, went)
11. I --------------for two hours. (have been reading, read, reads).
12. They ------------to the concert tomorrow. (goes, went, will go).

Q.5(A)	Create a re'sume' for applying for jobs in the future.	12M	4	3
	OR			
Q.5(B)	Explain the Brook's philosophy which can be implied to human life.	12M	4	3
Q.6(A)	How does intrapersonal communication help us overcome personal and professional challenges?	12M	5	2
	OR			
Q.6(B)	Write descriptive paragraphs of 200 words each on: (a) Use of AI in education and (b) Time management	12M	5	3

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B. Tech I Year II Semester (R23) Supplementary End Semester Examinations, January – 2025
DIFFERNETIAL EQUATIONS AND VECTOR CALCULUS
(Common to All)
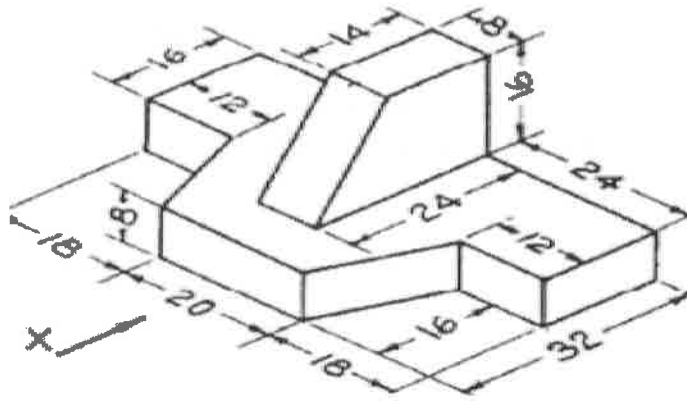
Time: 3Hrs   Max Marks: 70

> Attempt all the questions. All parts of the question must be answered in one place only.
> **All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only**

Q.No		Question	Marks	CO	BL
Q.1	i.	State the Newton's Law of Cooling.	1M	1	1
	ii.	Check whether $\left\{y\left(1+\frac{1}{x}\right)+cosy\right\}dx+(x+\log x-x\,siny)dy=0$ is exact or not.	1M	1	2
	iii.	Find the particular integral of $(D^2-1)y=sinx$.	1M	2	2
	iv.	Solve $(D-2)^2y=e^{2x}$.	1M	2	2
	v.	Form the Partial Differential Equation by eliminating the arbitrary function from $z=f(x^2+y^2)$.	1M	3	2
	vi	Solve $(D^2+4DD'-5D'^2)z=0$.	1M	3	2
	vii.	If $u=xy^3+yz^3$, find $gradu$.	1M	4	2
	viii.	If $F=x^2yzI+xy^2zJ+xyz^2K$, find $curl\,F$.	1M	4	2
	ix.	If $F=-xI-yJ$, find $\int_c F\cdot dR$, where C: $x=\cos\theta$; $y=\sin\theta$ from $\theta=0$ to $\theta=2\pi$.	1M	5	2
	x.	State Stoke's theorem.	1M	5	1
Q.2(A)		(i) Solve $Cosh\,x\,\frac{dy}{dx}+y\sinh x=2cosh^2x\sinh x$	6M	1	3
		(ii)Solve $\frac{dy}{dx}=y\tan x-y^2\sec x$	6M	1	3
		OR			
Q.2(B)		(i) $Solve\left(xy^2-e^{\frac{1}{x^3}}\right)dx-x^2ydy=0$	6M	1	3
		(ii)The rate at which bacteria multiply is proportional to the instantaneous number present. If the original number doubles in 2 hours, in how many hours will it triple?	6M	1	3
Q.3(A)		Solve $\frac{d^2y}{dx^2}-y=\frac{2}{(1+e^x)}$ by the method of variation of parameters	12M	2	3
		OR			
Q.3(B)		Solve the Simultaneous Linear Differential Equation $\frac{dx}{dt}+2y+\sin t=0,\frac{dy}{dt}-2x-\cos t=0$, $given\,x=0,y=1\,when\,t=0$.	12M	2	3
Q.4(A)		(i). Form the Partial Differential Equation by eliminating arbitrary function from $z=y^2+2f(\frac{1}{x}+loy\,y)$.	6M	3	2
		(ii). Solve $x^2(y-z)p+y^2(z-x)q=z^2(x-y)$	6M	3	3
		OR			
Q.4(B)		Solve $\frac{\partial^2z}{\partial x^2}+\frac{\partial^2z}{\partial x\partial y}-6\frac{\partial^2z}{\partial y^2}=y\cos x$	12M	3	3
Q.5(A)		(i)Find the unit vector normal to the surface x³+y³+3xyz=3 at the point (1, 2, -1).	6M	4	3
		(ii)Find the angle between the surface x² + y² + z² = 9 and x² + y² - 3 = z at the point (2, -1, 2)	6M	4	3
		OR			

Q.5(B)	Show that the following:	12M	` 4	3
	(a) $\nabla \cdot (\frac{f(r)}{r} R) = \frac{1}{r^2} \frac{d}{dr} [r^2 \ f(r)]$			
	(b) $\nabla^2 f(r) = f''(r) + \frac{2}{r} f'(r)$			
Q.6(A)	Verify Green's theorem for $\int_C [(3x^2 - 8y^2)dx + (4y - 6xy)dy]$ where C is the boundary of the region bounded by $x = 0, y = 0$ and $x + y = 1$.	12M	5	4

OR

| Q.6(B) | Verify divergence theorem for F taken over the cube bounded by $x = 0, x = 1; y = 0, y = 1$ and $z = 0, z = 1$ where $F = 4xzi - y^2j + yzk$ | 12M | 5 | 4 |

*** END***

Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐   Question Paper Code: 23ME101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B. Tech I Year I Semester (R23) Regular End Semester Examinations, January – 2025
ENGINEERING GRAPHICS
(Common to EEE and CSE-AIML)

Time: 3Hrs   Max Marks: 70

Attempt all the questions. All parts of the question must be answered in one place only.
In Q.no 1 to 5 answer either **Part-A or B only**

Q.No	Question	Marks	CO	BL
Q.1(A)	Construct a parabola with the distance of the focus from the directrix at 50 mm. Also draw tangent and normal 40 mm from directrix.	14M	1	3
	OR			
Q.1(B)	Construct a hyperbola when the distance between the focus and directrix is 45 mm and eccentricity is 5/4. Also, draw the tangent and normal 30 mm from the directrix.	14M	1	3
Q.2(A)	(i) A line AB 70mm long is inclined at an angle of 30° to H.P and 45° to V.P. The point A is 15 mm above H.P and 20mm in front of V.P. Draw its Projections. (ii) Draw the projections of the following points on the same reference line by keeping the distance between projectors as 40mm. a) E – 30mm below HP and 50mm behind VP b) F – 40mm above HP and 60mm behind VP c) G – 50mm above HP and 60mm in front of VP	7+7 M	2	3
	OR			
Q.2(B)	A rectangular plate of negligible thickness having 150 mm length and 100 mm width is resting on one of its smaller side on HP. The surface makes an inclination of 30° to HP and smaller side makes an inclination of 60° to VP. Draw the projection of the plate.	14M	2	3
Q.3(A)	A cube of 50 mm long edges is so placed on HP on one corner that a body diagonal is Parallel to HP and perpendicular to VP. Draw its projections.	14M	3	3
	OR			
Q.3(B)	A Cylinder of base diameter 45mm and axis 60mm has a base in V.P and axis inclined at 50° to V.P. Draw its projections.	14M	3	3
Q.4(A)	A pentagonal prism of base side 30 mm and height 80 mm resting on its base on H.P with one rectangular face is perpendicular to V.P. It is cut by a section plane inclined at 45° to the H.P and passing though the midpoint of the axis. Draw the sectional front view, sectional top view and true shape of the section.	14M	4	3
	OR			
Q.4(B)	A hexagonal prism of side of base 30 mm and axis 70 mm long is resting on its base on H.P. such that a rectangular face is perpendicular to V.P. It is cut by a section plane perpendicular to V.P. and inclined at 30 ° to H.P. The section plane is passing through the axis at a height of 35mm from the base. Draw the development of the lateral surface of the cut prism, Use parallel line method.	14M	4	3
Q.5(A)	Draw the front view, top view and right side view of the following object.	14M	5	3

Use first angle projection.

OR

Q.5(B)   Draw the isometric view of the object, the multi view projection of which   14M   5   3
          is shown below.

*** END***

Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐   Question Paper Code: 23ME101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B. Tech I Year I Semester (R23) Regular End Semester Examinations, January – 2025
ENGINEERING GRAPHICS
(Common to EEE and CSE-AIML)

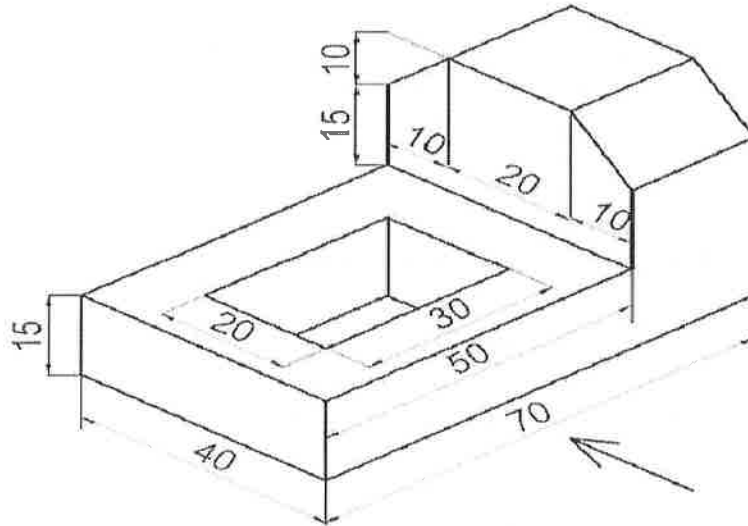Time: 3Hrs   Max Marks: 70

Attempt all the questions. All parts of the question must be answered in one place only.
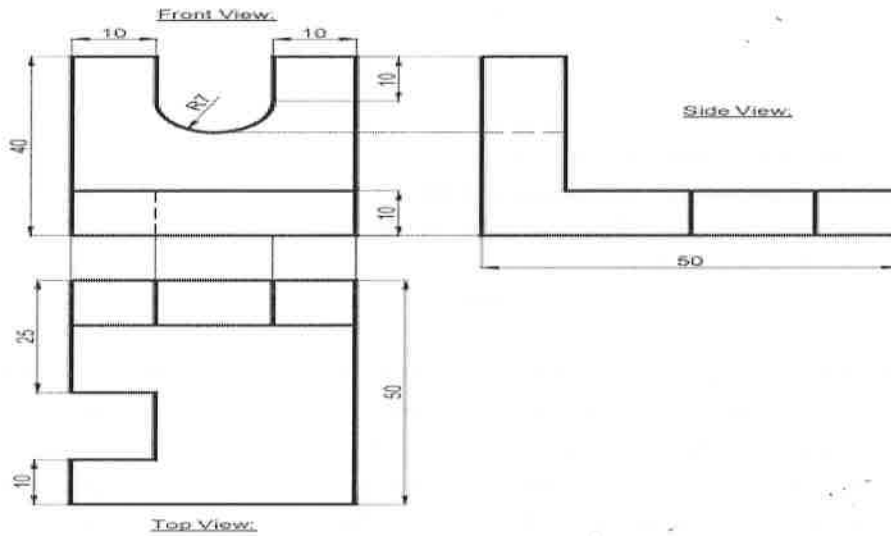**In Q.no 1 to 5** answer either **Part-A or B only**

Q.No	Question	Marks	CO	BL
Q.1(A)	A point is moving in such that the ratio of its distances from a fixed point (Focus) to its distance from a fixed line (Directrix) is 2:3. Name the curve and construct it. Construct a tangent & normal at any point on it.	14M	1	3
	OR			
Q.1(B)	Draw a hyperbola with the distance of the focus from the directrix at 50mm and e=3/2 (Eccentricity method). Also draw tangent and normal 40 mm from directrix.	14M	1	3
Q.2(A)	i) A line AB measuring 80mm has its end A 20mm above HP and 15mm in front of VP and the other end B is 60mm in front of VP and 50mm above HP. Draw the projection of the line and find the inclinations of the line.	7M	2	3

	(ii) Draw the projections of the following points on the same ground line, keeping the distance between the projectors is 50mm, Name the quadrants in which they lie.
	  1. Point A, 30 mm in front of V.P. and 45 mm above the H.P.
	  2. Point B, 30 mm below the H.P. and 40mm behind the V.P.
	  3. Point C, 30mm above the H.P. and 25mm behind the V.P.
		7M		

	OR			
Q.2(B)	A square ABCD of 50mm side has its corner A in the H.P. Its diagonal AC is inclined at 30° the H.P and the diagonal BD inclined at 45° to the VP and parallel to H.P. Draw its Projections.	14M	2	3
Q.3(A)	A Hexagonal Pyramid of base side 30mm and axis 60mm has a side of its base on the ground. Its axis is inclined at 30° to the ground and parallel to VP. Draw its Projections.	14M	3	3
	OR			
Q.3(B)	A Pentagonal prism, having a base with a 30mm side and an 70mm long axis, rests on one of its rectangular face in the H.P such that the axis is inclined at 30⁰ to the VP. Draw its projections?	14M	3	3
Q.4(A)	A Cube of 50mm edges is resting one of its faces on HP with vertical faces equally inclined to VP. It is cut by a plane 45° inclined to HP and passing through the midpoint of axis. Draw the three views of the solid and also obtain the true shape of the section.	14M	4	3
	OR			
Q.4(B)	A Cylinder of base 50mm and axis 60mm is resting on ground with its axis vertical. It is cut by a section plane perpendicular to VP and inclined at 35° to HP passing through the top of the generator and cuts all other generators. Draw the development of surface using parallel line method.	14M	4	3

Q.5(A)   Draw the front view, top view and right side view of the following object.   14M   5   3
Use first angle projection.

OR

Q.5(B)   Draw the isometric view of the object, the multi view projection of which   14M   5   3
is shown below:

*** END***

Hall Ticket No:

Question Paper Code: 23ME101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B. Tech I Year I Semester (R23) Regular End Semester Examinations, January – 2025
ENGINEERING GRAPHICS
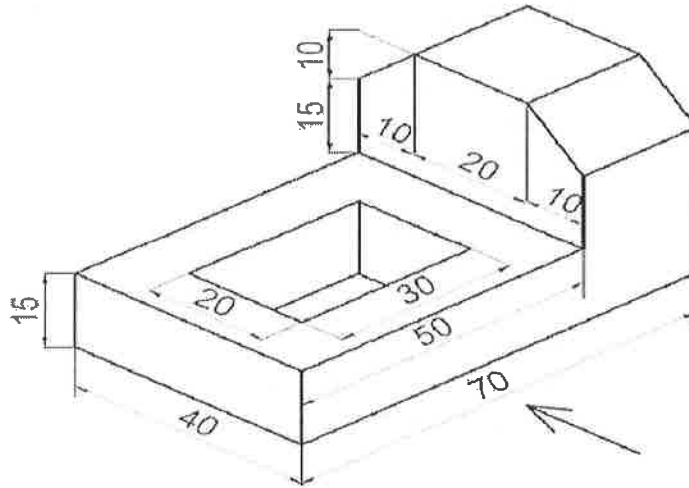(Electronics & Communication Engineering)

Time: 3Hrs | Max Marks: 70

Attempt all the questions. All parts of the question must be answered in one place only.
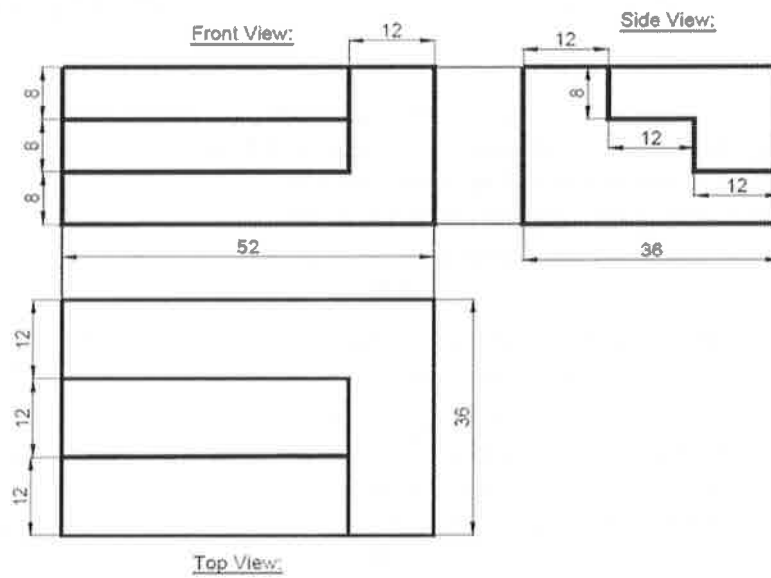**In Q.no 1 to 5** answer either **Part-A or B only**

Q.No	Question	Marks	CO	BL
Q.1(A)	Construct an ellipse when the distance between the focus and directrix is 35 mm and eccentricity is 3/4. Also draw the tangent and normal to any point on the curve.	14M	1	3
	OR			
Q.1(B)	A circle of 40 mm diameter rolls along a straight line for one revolution clock wise. Draw the locus of a point on the circle which is contact with line. Also draw tangent and normal 30 mm from directing line.	14M	1	3
Q.2(A)	(i) A point A is 20mm above HP and 30mm in front of VP. Another point B is 35mm behind VP and 45mm below HP. Draw the projections of A and B keeping the distance between projectors equal to 60mm. Draw straight lines joining the front views and top views.	7 M	2	3
	(ii) A line PQ 90mm long has its end P 20mm above HP and 25mm in front of VP. The top view and front view of the line measures 75mm and 60mm respectively. Draw the projections of the line and find the inclinations of PQ with HP and VP.	7 M		
	OR			
Q.2(B)	A Pentagonal lamina of 30 mm sides is resting on HP on one of its sides with its surface 45⁰ inclined to HP. Draw the projections of the lamina when the side in HP makes 35⁰ angle with VP.	14M	2	3
Q.3(A)	Draw the projections of a hexagonal prism with a base side of 30 mm and an axis length of 60 mm. The base rests on the horizontal plane and the axis is inclined at 45° to the H.P and parallel to the V.P.	14M	3	3
	OR			
Q.3(B)	A pentagonal pyramid has a base edge of 30 mm and an axis length of 70 mm. Position the pyramid such that one of its base edges lies in the VP, while its axis is inclined at 35° to the VP and parallel to the HP. Apply your knowledge of projection techniques to construct its projections.	14M	3	3
Q.4(A)	A Cone base 70 mm diameter and axis 80 mm long is resting on its base on H.P. It is cut by a section plane perpendicular to the V.P., inclined at 450 to the H.P. and cutting the axis at a point 35 mm from the apex. Draw the front view, sectional top view, sectional side view and true shape of the section.	14M	4	3
	OR			
Q.4(B)	A square pyramid, base 40 mm side and axis 80 mm long, has its base on the HP and all the edges of the base equally inclined to the VP. It is cut by a section plane, perpendicular to the VP, inclined at 45⁰ to the HP and bisecting the axis. Draw its development of the remaining portion. Use radial line method.	14M	4	3

Q.5(A)   Draw the front view, top view and right side view of the following object.   14M   5   3
Use first angle projection.

OR

Q.5(B)   Draw the isometric view of the object, the multi view projection of which   14M   5   3
is shown below.

*** **END** ***

Hall Ticket No: [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]   Question Paper Code: 23ME101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B. Tech I Year I Semester (R23) Regular End Semester Examinations, January – 2025
ENGINEERING GRAPHICS
(Electronics & Communication Engineering)

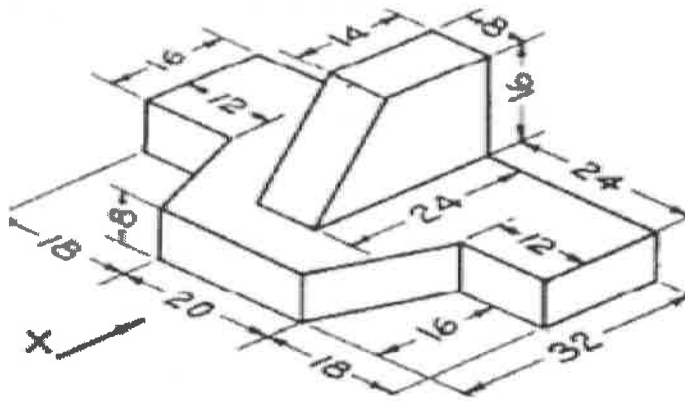Time: 3Hrs   Max Marks: 70

Attempt all the questions. All parts of the question must be answered in one place only.
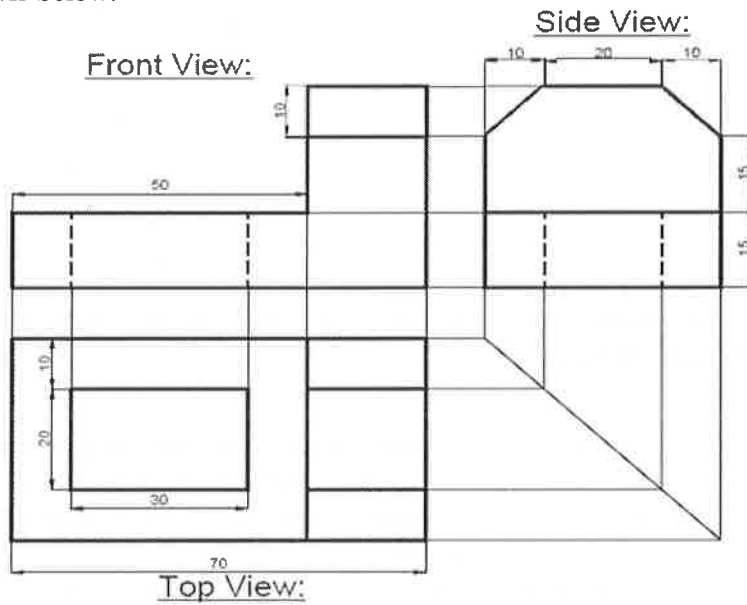**In Q.no 1 to 5** answer either **Part-A or B only**

Q.No	Question	Marks	CO	BL
Q.1(A)	Draw a hyperbola with the distance of the focus from the directrix at 50mm and e=3/2 (Eccentricity method). Also draw tangent and normal 40 mm from directrix.	14M	1	3
	OR			
Q.1(B)	Draw the involute of regular Pentagon 40 mm side. Also, draw a tangent and normal to the curve at a point 100 mm from Centre of the pentagon.	14M	1	3
Q.2(A)	(i) Front View of line AB 50° inclined to XY and measures 55mm, its top view 60° inclined XY. End A is 10mm above HP and 15mm in front of VP. Find TL, θ, φ.	7 M	2	3
	(ii)Draw the projections of the following points by keeping the projectors as 50mm apart.	7 M		
	1. Point A – in HP and 20mm behind VP			
	2. Point B – 30mm below HP, 45mm behind VP			
	3. Point C – 40mm above HP, 35mm in front of VP			
	4. Point D – on HP and on VP			
	OR			
Q.2(B)	Draw the projections of a circle of 50mm diameter resting in the HP one point on the circumference. Its plane is inclined at 45° to the HP and the top view of the diameter making an angle of 30° with the VP.	14M	2	3
Q.3(A)	Hexagonal pyramid of base side 40mm and axis 70mm has an edge of its base on the HP. Its axis is inclined at 35° to the HP and parallel to V.P. Draw its projections.	14M	3	3
	OR			
Q.3(B)	A Cylinder of 50 mm diameter and 60 mm axis is resting on one point of a base circle on VP while its axis makes 45° with VP and parallel to HP. Draw its projections.	14M	3	3
Q.4(A)	A square pyramid, base 40 mm side and axis 75 mm long, has its base on the HP and all the edges of the base equally inclined to the VP. It is cut by a section plane, perpendicular to the VP, inclined at 45° to the HP and bisecting the axis. Draw its sectional top view, sectional side view and true shape of the section.	14M	4	3
	OR			
Q.4(B)	A Cone of base 50mm and axis 60mm is resting on ground with its axis vertical. It is cut by a section plane perpendicular to VP and inclined at 45° to HP passing through the base of the end generator and cuts all other generators. Draw the development of surface. Use radial line method.	14M	4	3

Q.5(A)   Draw the front view, top view and side view of the following object. Use   14M   5   3
          first angle projection.

OR

Q.5(B)   Draw the isometric view of the object, the multi view projection of which   14M   5
          is shown below:

*** **END*****

Hall-Ticket No: ☐☐☐☐☐☐☐☐☐☐

Question Paper Code: 23ME101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B. Tech I Year I Semester (R23) Regular End Semester Examinations, January – 2025
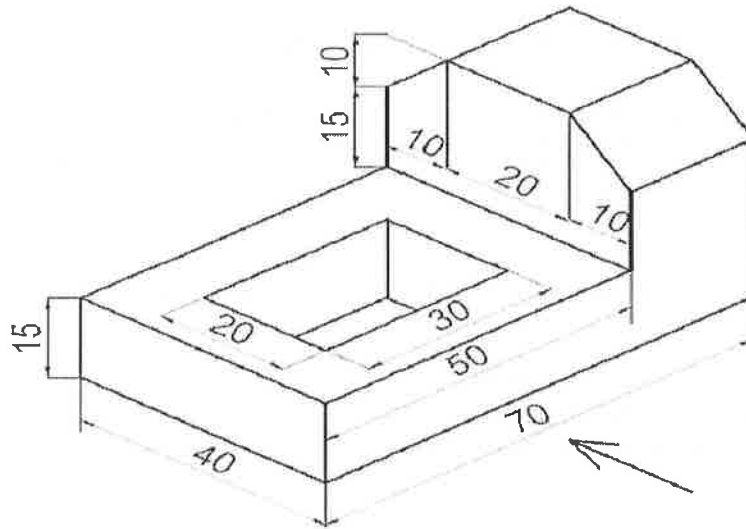## ENGINEERING GRAPHICS
(Common to ECE and CSE)

Time: 3Hrs

Max Marks: 70

Attempt all the questions. All parts of the question must be answered in one place only.
In Q.no 1 to 5 answer either Part-A or B only

Q.No	Question	Marks	CO	BL
Q.1(A)	Construct an ellipse when the distance between the focus and directrix is 50 mm and eccentricity is 3/4. Also draw the tangent and normal to any point on the curve.	14M	1	3
	OR			
Q.1(B)	Draw the involute of regular Pentagon 50 mm side. Also, draw a tangent and normal to the curve at a point 120 mm from Centre of the pentagon.	14M	1	3
Q.2(A)	(i) A line AB 80mm long is inclined at an angle of 40° to H.P and 55° to V.P. The point A is 25 mm above H.P and 20mm in front of V.P. Draw its Projections.	7M	2	3
	(ii) Draw the projections of the following points on the same reference line by keeping the distance between projectors as 40mm. a) E – 50mm below HP and 70mm behind VP b) F – 40mm above HP and 50mm behind VP c) G – 60mm above HP and 80mm in front of VP	7M	2	3
	OR			
Q.2(B)	Draw the projections of a circle of 60mm diameter resting in the HP at one point on the circumference. Its plane is inclined at 55° to the HP and the top view of the diameter making an angle of 40° with the VP.	14M	2	3
Q.3(A)	A Hexagonal Prism with a base side of 30mm and an axis of 60mm has a corner of its base on the ground. Its axis is inclined at 30° to the ground and parallel to VP. Draw its Projections.	14M	3	3
	OR			
Q.3(B)	A Pentagonal pyramid, having a base with a 30mm side and a 70mm long axis, rests on one of its rectangular faces in the H.P. such that the axis is inclined at 30° to the VP. Draw its projections?	14M	3	3
Q.4(A)	A hexagonal prism of side of base 50 mm and axis 90 mm long is resting on its base on H.P. such that a rectangular face is perpendicular to V.P. It is cut by a section plane perpendicular to V.P. and inclined at 30° to H.P. The section plane is passing through the axis at a height of 45mm from the base. Draw the development of the lateral surface of the cut prism; use the parallel line method.	14M	4	3
	OR			
Q.4(B)	A square pyramid, base 50 mm side and axis 85 mm long, has its base on the HP and all the edges of the base equally inclined to the VP. It is cut by a section plane, perpendicular to the VP, inclined at 45° to the HP and bisecting the axis. Draw its sectional top view, sectional side view and true shape of the section.	14M	4	3

Q.5(A)   Draw the front view, top view and side view of the following object. Use   14M   5   3
first angle projection.

OR

Q.5(B)   Draw the isometric view of the object, the multi view projection of which   14M   5
is shown below.

*** END***

Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐   Question Paper Code: 23ME101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B. Tech I Year I Semester (R23) Regular End Semester Examinations, January – 2025
ENGINEERING GRAPHICS
(Common to ECE and CSE)

Time: 3Hrs   Max Marks: 70

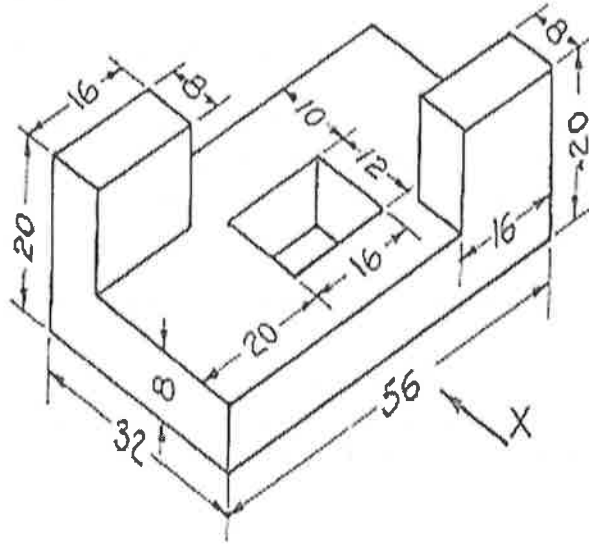> Attempt all the questions. All parts of the question must be answered in one place only.
> **In Q.no 1 to 5** answer either **Part-A or B only**

Q.No	Question	Marks	CO	BL
Q.1(A)	A point is moving in such that the ratio of its distances from a fixed point (Focus) to its distance from a fixed line (Directrix) is 2:3. Name the curve and construct it. Construct a tangent & normal at any point on it.	14M	1	3
	OR			
Q.1(B)	Draw an involute of a Hexagon of 50mm side. Also, draw a tangent and normal at 130 mm from the center of the hexagon on the curve.	14M	1	3
Q.2(A)	(i) Point A is 20mm above HP and 30mm in front of VP. Another point B is 35mm behind VP and 45mm below HP. Draw the projections of A and B keeping the distance between projectors equal to 60mm. Draw straight lines joining the front views and top views.	7M	2	3
	(ii) A line PQ 90mm long has its end P 20mm above HP and 25mm in front of VP. The top view and front view of the line measures 75mm and 60mm respectively. Draw the projections of the line and find the inclinations of PQ with HP and VP.	7M	2	3
	OR			
Q.2(B)	A rectangular plate of negligible thickness having 150 mm length and 100 mm width is resting on one of its smaller side on HP. The surface makes an inclination of 30⁰ to HP and smaller side makes an inclination of 60⁰ to VP. Draw the projection of the plate.	14M	2	3
Q.3(A)	Draw the projection of a cone base 55mm diameter and axis 55mm long when it is resting on a ground on a point on its base circle with the axis making an angle of 30 ⁰ with HP.	14M	3	3
	OR			
Q.3(B)	A pentagonal pyramid has a base edge of 40 mm and an axis length of 60 mm. Position the pyramid such that one of its base edges lies in the VP, while its axis is inclined at 35° to the VP and parallel to the HP. Apply your knowledge of projection techniques to construct its projections.	14M	3	3
Q.4(A)	A Cube of 60mm edges is resting one of its faces on HP with vertical faces equally inclined to VP. It is cut by a plane 45° inclined to HP and passing through the midpoint of axis. Draw the three views of the solid and also obtain the true shape of the section.	14M	4	3
	OR			
Q.4(B)	A Cone of base 50mm and axis 60mm is resting on ground with its axis vertical. It is cut by a section plane perpendicular to VP and inclined at 45° to HP passing through the base of the end generator and cuts all other generators. Draw the development of surface. Use radial line method.	14M	4	3

Q.5(A) Draw the front view, top view and right side view of the following object.   14M   5   3
        Use first angle projection.

OR

Q.5(B) Draw the isometric view of the object, the multi view projection of which   14M   5   3
        is shown below.

*** END***

Hall Ticket No: [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

Question Paper Code: 23ME101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B. Tech I Year I Semester (R23) Regular End Semester Examinations, January – 2025
ENGINEERING GRAPHICS
(Computer Science & Engineering)

Time: 3Hrs

Max Marks: 70

Attempt all the questions. All parts of the question must be answered in one place only.
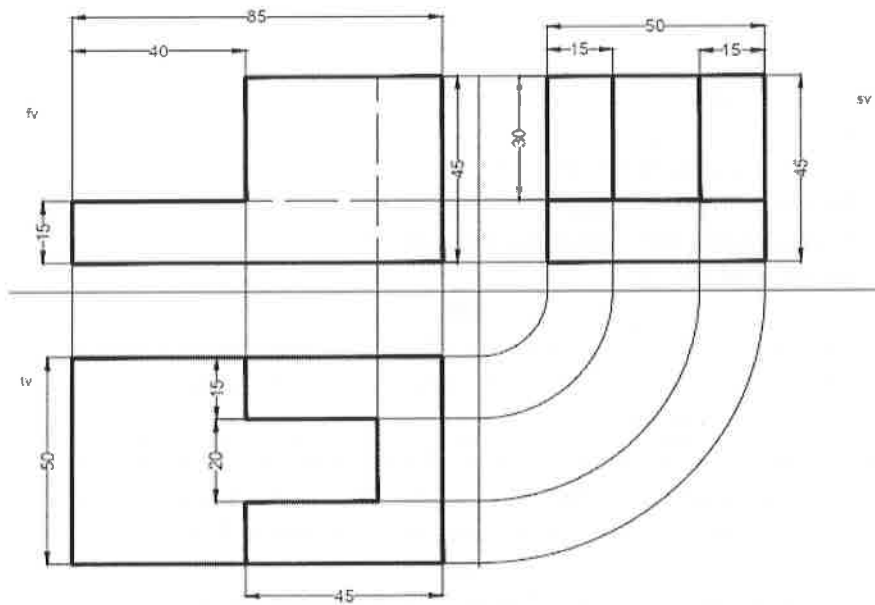**All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only**

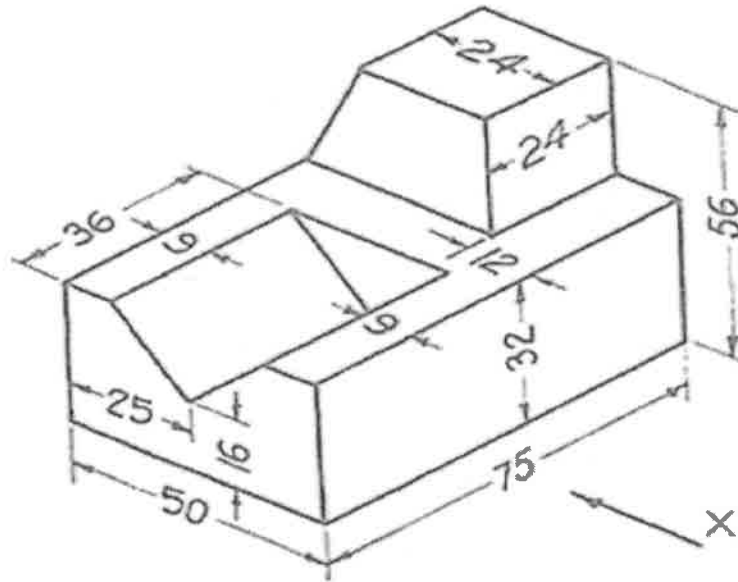| Q.No	Question	Marks	CO	BL
Q.1(A)	Construct an ellipse when the distance between the focus and directrix is 35 mm and eccentricity is 3/4. Also draw the tangent and normal to any point on the curve.	14M	1	3
	OR			
Q.1(B)	Draw the involute of regular Pentagon 40 mm side. Also, draw a tangent and normal to the curve at a point 100 mm from Centre of the pentagon.	14M	1	3
Q.2(A)	(i) A point A is 20mm above HP and 30mm in front of VP. Another point B is 35mm behind VP and 45mm below HP. Draw the projections of A and B keeping the distance between projectors equal to 60mm. Draw straight lines joining the front views and top views.	7 M	2	3
	(ii) A line PQ 90mm long has its end P 20mm above HP and 25mm in front of VP. The top view and front view of the line measures 75mm and 60mm respectively. Draw the projections of the line and find the inclinations of PQ with HP and VP.	7 M	2	3
	OR			
Q.2(B)	A rectangular plate of negligible thickness having 150 mm length and 100 mm width is resting on one of its smaller side on HP. The surface makes an inclination of 30⁰ to HP and smaller side makes an inclination of 60⁰ to VP. Draw the projection of the plate.	14M	2	3
Q.3(A)	A Hexagonal Pyramid of base side 30mm and axis 60mm has a corner of its base on the ground. Its axis is inclined at 30° to the ground and parallel to VP. Draw its Projections.	14M	3	3
	OR			
Q.3(B)	A Pentagonal prism, having a base with a 30mm side and an 70mm long axis, rests on one of its rectangular face in the H.P such that the axis is inclined at 30⁰ to the VP. Draw its projections?	14M	3	3
Q.4(A)	A Cube of 50mm edges is resting one of its faces on HP with vertical faces equally inclined to VP. It is cut by a plane 45° inclined to HP and passing through the midpoint of axis. Draw the three views of the solid and also obtain the true shape of the section.	14M	4	3
	OR			
Q.4(B)	A square pyramid, base 40 mm side and axis 80 mm long, has its base on the HP and all the edges of the base equally inclined to the VP. It is cut by a section plane, perpendicular to the VP, inclined at 45⁰ to the HP and bisecting the axis. Draw its development of the remaining portion. Use radial line method.	14M	4	3

Q.5(A)   Draw the front view, top view and side view of the following object. Use first angle projection.   14M   .5   3

OR

Q.5(B)   Draw the isometric view of the object, the multi view projection of which is shown below: 14M   5

Front View:

Side View:

Top View:

*** END***

Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐

Question Paper Code: 23ME101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B. Tech I Year I Semester (R23) Regular End Semester Examinations, January – 2025
ENGINEERING GRAPHICS
(Computer Science & Engineering)

Time: 3Hrs

Max Marks: 70

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

Q.No	Question	Marks	CO	BL
Q.1(A)	Construct a parabola with the distance of the focus from the directrix at 50 mm. Also draw tangent and normal 40 mm from directrix.	14M	1	3
	OR			
Q.1(B)	A circle of 40 mm diameter rolls along a straight line for one revolution clockwise. Draw the locus of a point on the circle which is contact with line. Also draw tangent and normal 30 mm from directing line.	14M	1	3
Q.2(A)	(i) Front View of line AB 50° inclined to XY and measures 55mm, its top view 60° inclined XY. End A is 10mm above HP and 15mm in front of VP. Find true length and its inclination angle (θ, φ) with XY.	7 M	2	3
	(ii) Draw the projections of the following points by keeping the projectors as 50mm apart. 1. Point A – in HP and 20mm behind VP 2. Point B – 30mm below HP, 45mm behind VP 3. Point C – 40mm above HP, 35mm in front of VP 4. Point D – on HP and on VP	7 M	2	3
	OR			
Q.2(B)	Draw the projections of a regular hexagon of 30 mm side, having one of its sides in HP and inclined at 60° to VP. The surface of the hexagon is making an angle of 45° with HP.	14M	2	3
Q.3(A)	Draw the projections of a hexagonal pyramid with a base side of 30 mm and an axis length of 60 mm. The base rests on the horizontal plane and the axis is inclined at 45° to the H.P and parallel to the V.P.	14M	3	3
	OR			
Q.3(B)	A Cylinder of 50 mm diameter and 60 mm axis is resting on one point of a base circle on VP while its axis makes 45⁰ with VP and parallel to HP. Draw its projections.	14M	3	3
Q.4(A)	A pentagonal prism of base side 30 mm and height 80 mm resting on its base on H.P with one rectangular face is perpendicular to V.P. It is cut by a section plane inclined at 45⁰ to the H.P and passing though the midpoint of the axis. Draw the development of the lateral surface of the truncated prism.	14M	4	3
	OR			
Q.4(B)	A Cone of base 50mm and axis 60mm is resting on ground with its axis vertical. It is cut by a section plane perpendicular to VP and inclined at 45° to HP passing through the base of the end generator and cuts all other generators. Draw the development of surface. Use radial line method.	14M	4	3

Q.5(A)   Draw the front view, top view and right side view of the following object.   14M   5   3
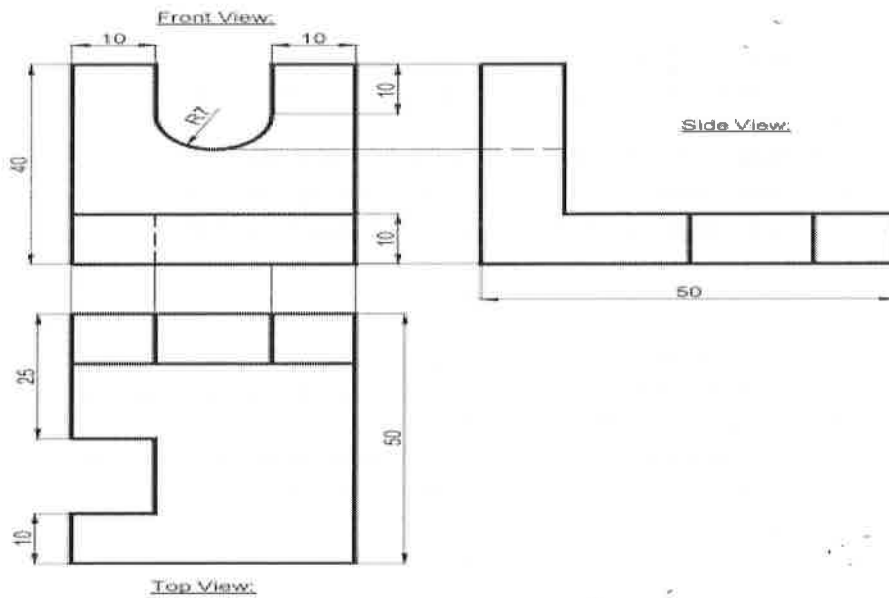   Use first angle projection.

OR

Q.5(B)   Draw the isometric view of the object, the multi view projection of which   14M   5
          is shown below:

*** END***

Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐

Question Paper Code: 23ME101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B. Tech I Year I Semester (R23) Regular End Semester Examinations, January – 2025
ENGINEERING GRAPHICS
(Computer Science & Engineering)

Time: 3Hrs

Max Marks: 70

Attempt all the questions. All parts of the question must be answered in one place only.
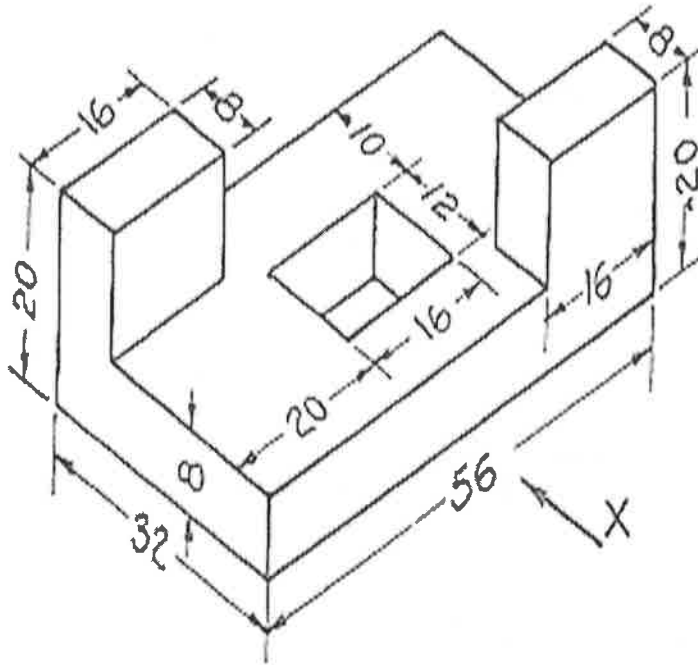**In Q.no 1 to 5** answer either **Part-A or B only**

Q.No	Question	Marks	CO	BL
Q.1(A)	Construct a parabola with the distance of the focus from the directrix at 50 mm. Also draw tangent and normal 40 mm from directrix.	14M	1	3
	OR			
Q.1(B)	Draw an involute of a Hexagon of 50mm side. Also, draw a tangent and normal at 130 mm from the center of the hexagon on the curve.	14M	1	3
Q.2(A)	(i) A line AB measuring 80mm has its end A 20mm above HP and 15mm in front of VP and the other end B is 60mm in front of VP and 50mm above HP. Draw the projection of the line and find the inclinations of the line.	7 M	2	3
	(ii) Draw the projections of the following points on the same ground line, keeping the distance between the projectors is 50mm, Name the quadrants in which they lie. 1. Point A, 30 mm in front of V.P. and 45 mm above the H.P. 2. Point B, 30 mm below the H.P. and 40mm behind the V.P. 3. Point C, 30mm above the H.P. and 25mm behind the V.P.	7 M	2	3
	OR			
Q.2(B)	A Pentagonal lamina of 30 mm sides is resting on HP on one of its sides with its surface 45⁰ inclined to HP. Draw the projections of the lamina when the side in HP makes 35⁰ angle with VP.	14M	2	3
Q.3(A)	A Cylinder of 50 mm diameter and 60 mm axis is resting on one point of a base circle on VP while its axis makes 45⁰ with VP and parallel to HP. Draw its projections.	14 M	3	3
	OR			
Q.3(B)	A hexagonal pyramid of base side 35 mm and axis 70 mm has an edge of its base on the ground. Its axis is inclined at 30⁰ to the ground and parallel to the V.P. Draw its projections.	14M	3	3
Q.4(A)	A Cone base 70 mm diameter and axis 80 mm long is resting on its base on H.P. It is cut by a section plane perpendicular to the V.P., inclined at 450 to the H.P. and cutting the axis at a point 35 mm from the apex. Draw the front view, sectional top view, sectional side view and true shape of the section.	14M	4	3
	OR			
Q.4(B)	A Cylinder of base 50mm and axis 60mm is resting on ground with its axis vertical. It is cut by a section plane perpendicular to VP and inclined at 45° to HP passing through the top of the generator and cuts all other generators. Draw the development of surface. Use parallel line method.	14M	4	3

Q.5(A)   Draw the front view, top view and right side view of the following object.   14M   5   3
Use first angle projection:

OR

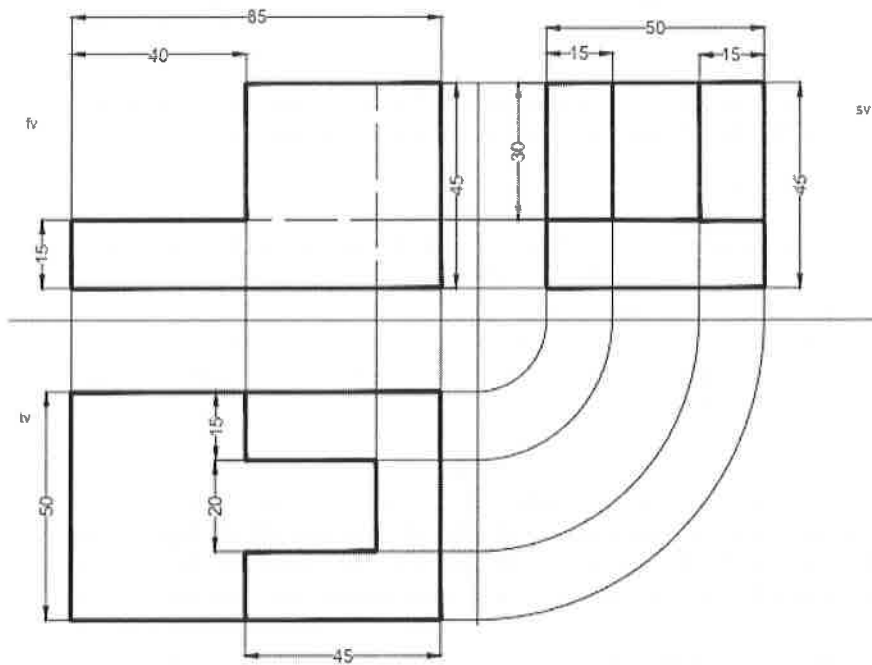**Q.5(B)**   Draw the isometric view of the object, the multi view projection of which   14M   5   3
is shown below:

*** END***

Hall Ticket No: [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]   Question Paper Code: 23ME101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B. Tech I Year I Semester (R23) Regular End Semester Examinations, January – 2025
ENGINEERING GRAPHICS
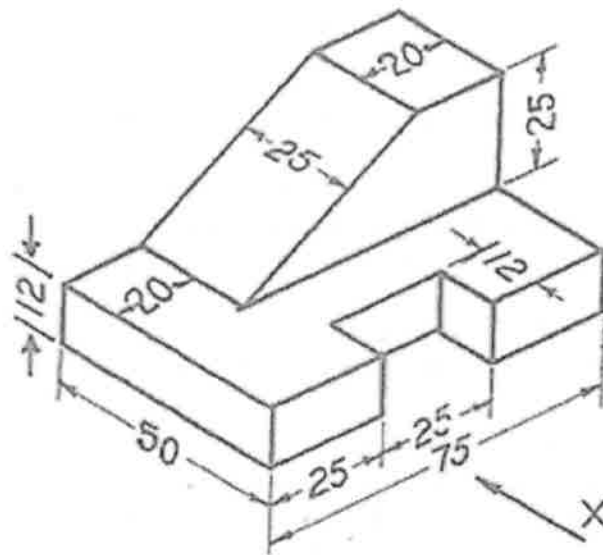(Computer Science & Engineering)

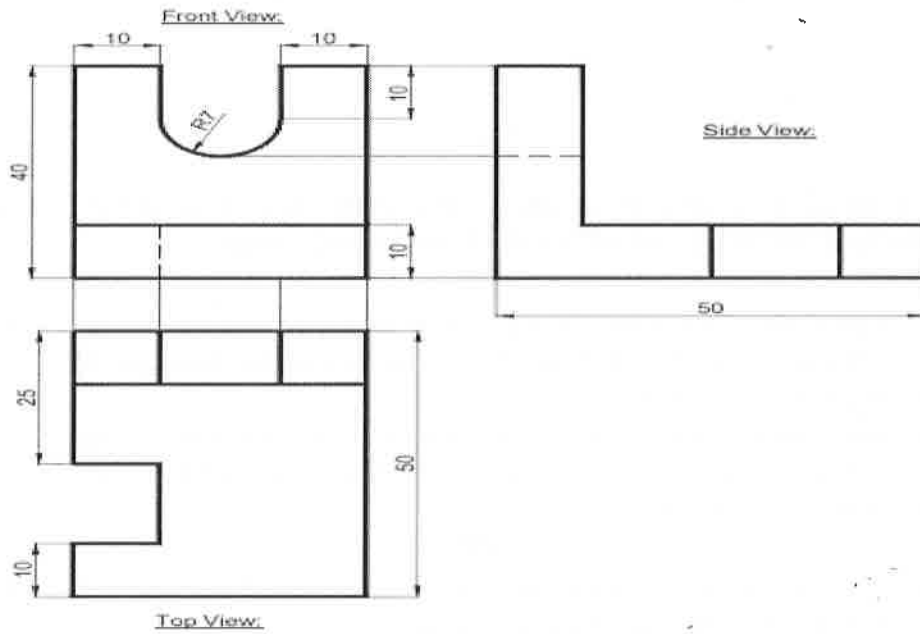Time: 3Hrs   Max Marks: 70

Attempt all the questions. All parts of the question must be answered in one place only.
In Q.no 1 to 5 answer either **Part-A or B only**

Q.No	Question	Marks	CO	BL
Q.1(A)	Construct a hyperbola when the distance between the focus and directrix is 45 mm and eccentricity is 5/4. Also, draw the tangent and normal 30 mm from the directrix.	14M	1	3
	OR			
Q.1(B)	Draw an involute of a Pentagon of 50mm side. Also, draw a tangent and normal at 130 mm from the center of the pentagon on the curve.	14M	1	3
Q.2(A)	(i) Draw the projections of the following points on the same reference line by keeping the distance between projectors as 50mm. 1. A – 40mm below HP and 50mm behind VP 2. B – 50mm above HP and 60mm behind VP 3. C – Point is in HP and 30mm behind VP	7M	2	3
	(ii) Line AB 80mm long, A is 20mm above HP and 30mm in front of VP. Line AB inclined 30° to HP and 45° to VP. Draw its projections	7M	2	3
	OR			
Q.2(B)	Draw the projections of a regular hexagon of 30 mm side, having one of its sides in HP and inclined at 60° to VP. The surface of the hexagon is making an angle of 45° with HP.	14M	2	3
Q.3(A)	Draw the projection of a cone base 45mm diameter and axis 50mm long when it is resting on a ground on a point on its base circle with the axis making an angle of 30 ° with HP.	14M	3	3
	OR			
Q.3(B)	A pentagonal pyramid has a base edge of 30 mm and an axis length of 70 mm. Position the pyramid such that one of its base edges lies in the VP, while its axis is inclined at 35° to the VP and parallel to the HP. Apply your knowledge of projection techniques to construct its projections.	14M	3	3
Q.4(A)	A pentagonal prism of base side 30 mm and height 80 mm resting on its base on H.P with one rectangular face is perpendicular to V.P. It is cut by a section plane inclined at 45⁰ to the H.P and passing though the midpoint of the axis. Draw the development of the lateral surface of the truncated prism.	14M	4	3
	OR			
Q.4(B)	A Cone of base 50mm and axis 60mm is resting on ground with its axis vertical. It is cut by a section plane perpendicular to VP and inclined at 45° to HP passing through the base of the end generator and cuts all other generators. Draw the development of surface. Use radial line method.	14M	4	3

Q.5(A)   Draw the front view, top view and right side view of the following object.   14M   5   3
          Use first angle projection.

OR

Q.5(B)   Draw the isometric view of the object, the multi view projection of which   14M   5   3
          is shown below.

*** END***

Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐

Question Paper Code: 23ME101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B. Tech I Year I Semester (R23) Regular End Semester Examinations, January – 2025
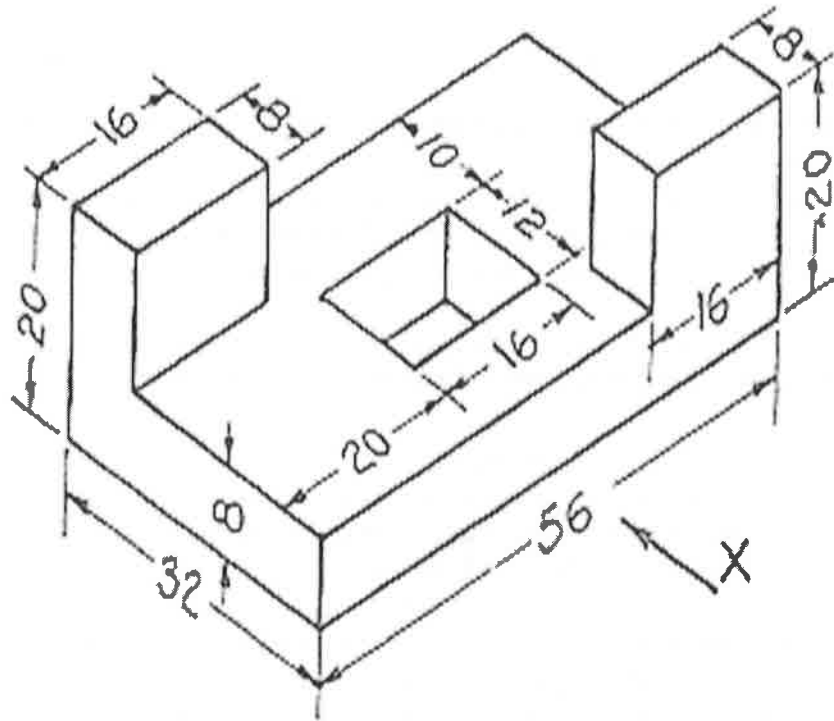## ENGINEERING GRAPHICS
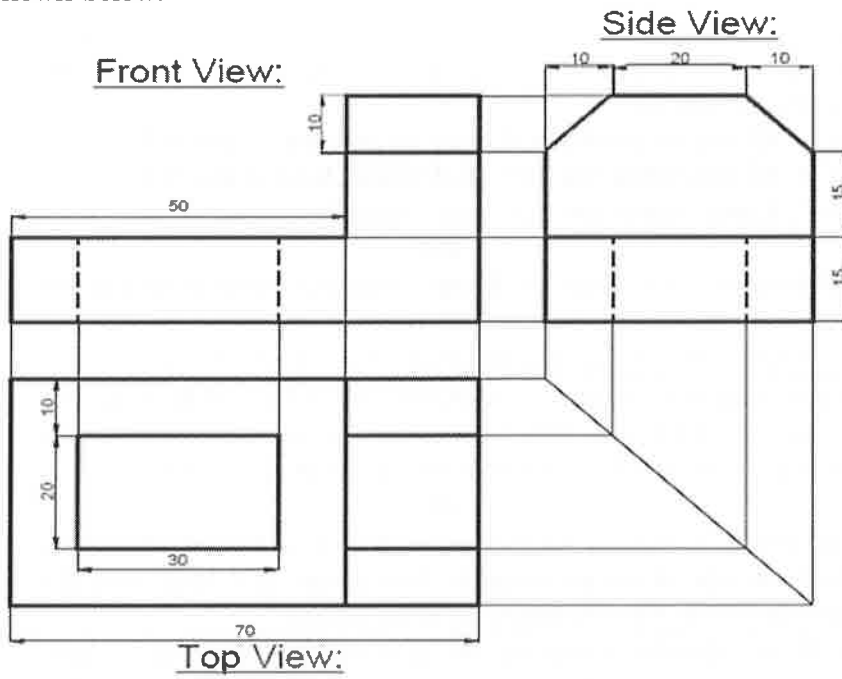(Computer Science & Engineering)

Time: 3Hrs

Max Marks: 70

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

Q.No	Question	Marks	CO	BL
Q.1(A)	Draw an involute of a circle of 50 mm diameter. Also, draw a tangent and normal to the curve at a point 90 mm from Centre of the circle.	14M	1	3
	OR			
Q.1(B)	Construct a hyperbola when the distance between the focus and directrix is 45 mm and eccentricity is 5/4. Also, draw the tangent and normal 30 mm from the directrix.	14M	1	3
Q.2(A)	(i) Draw the projections of the following points on the same reference line by keeping the distance between projectors as 50mm. 1. A – 40mm below HP and 50mm behind VP 2. B – 50mm above HP and 60mm behind VP 3. C – Point is in HP and 30mm behind VP	7 M	2	3
	(ii) Line AB 80mm long, A is 20mm above HP and 30mm in front of VP. Line AB inclined 30° to HP and 45° to VP. Draw its projections.	7 M	2	3
	OR			
Q.2(B)	Draw the projections of a regular hexagon of 30 mm side, having one of its sides in HP and inclined at 60° to VP. The surface of the hexagon is making an angle of 45° with HP.	14M	2	3
Q.3(A)	Draw the projection of a cone base 45mm diameter and axis 50mm long when it is resting on a ground on a point on its base circle with the axis making an angle of 30 ⁰ with HP.	14M	3	3
	OR			
Q.3(B)	A Cylinder of base diameter 45mm and axis 60mm has a base in V.P and inclined at 50° to V.P. Draw its projections.	14M	3	3
Q.4(A)	A square pyramid, base 40 mm side and axis 80 mm long, has its base on the HP and all the edges of the base equally inclined to the VP. It is cut by a section plane, perpendicular to the VP, inclined at 45⁰ to the HP and bisecting the axis. Draw its development of the remaining portion. Use radial line method.	14M	4	3
	OR			
Q.4(B)	A hexagonal prism, 30 mm base side & 60 mm axis is standing on HP on its base whose two sides are perpendicular to VP. It is cut by a section plane 45⁰ inclined to HP, through mid-point of axis. Draw Front view, sectional Top view and sectional Side view. Also draw true shape of section	14M	4	3
Q.5(A)	Draw the front view, top view and right side view of the following object. Use first angle projection.	14M	5	3

OR

Q.5(B)   Draw the isometric view of the object, the multi view projection of which   14M   5
          is shown below:

*** END***

Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐   Question Paper Code: 23ME101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)

B. Tech I Year I Semester (R23) Regular End Semester Examinations, January – 2025
ENGINEERING GRAPHICS
(Computer Science & Engineering)

Time: 3Hrs   Max Marks: 70

> Attempt all the questions. All parts of the question must be answered in one place only.
> **All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only**

Q.No	Question	Marks	CO	BL
Q.1(A)	Construct a cycloid for one revolutions when the radius of the generating circle is 25 mm. Also, draw a tangent and normal to the curve at a point 40 mm from the directing line.	14M	1	3
	OR			
Q.1(B)	Construct a parabola with the distance of the focus from the directrix at 50 mm. Also draw tangent and normal 40 mm from directrix.	14M	1	3
Q.2(A)	(i) A line AB measuring 80mm has its end A 20mm above HP and 15mm in front of VP and the other end B is 60mm in front of VP and 50mm above HP. Draw the projection of the line and find the inclinations of the line.	7M	2	3
	(ii) Draw the projections of the following points on the same ground line, keeping the distance between the projectors is 50mm, Name the quadrants in which they lie. 1. Point A, 30 mm in front of V.P. and 45 mm above the H.P. 2. Point B, 30 mm below the H.P. and 40mm behind the V.P. 3. Point C, 30mm above the H.P. and 25mm behind the V.P.	7M	2	3
	OR			
Q.2(B)	Draw the projections of a circle of 50mm diameter resting in the HP onepointon the circumference. Its plane is inclined at 45° to the HP and the top view of the diameter making an angle of 30° with the VP.	14M	2	3
Q.3(A)	Draw the projections of a hexagonal pyramid with a base side of 30 mm and an axis length of 60 mm. The base rests on the horizontal plane and the axis is inclined at 45° to the H.P and parallel to the V.P.	14M	3	3
	OR			
Q.3(B)	A Pentagonal prism, having a base with a 30mm side and an 70mm long axis, rests on one of its rectangular face in the H.P such that the axis is inclined at 30⁰ to the VP. Draw its projections?	14M	3	3
Q.4(A)	A Cone base 70 mm diameter and axis 80 mm long is resting on its base on H.P. It is cut by a section plane perpendicular to the V.P., inclined at 45⁰ to the H.P. and cutting the axis at a point 35 mm from the apex. Draw the front view, sectional top view, sectional side view and true shape of the section.	14M	4	3
	OR			
Q.4(B)	A Cylinder of base 50mm and axis 60mm is resting on ground with its axis vertical. It is cut by a section plane perpendicular to VP and inclined at 35° to HP passing through the top of the generator and cuts all other generators. Draw the development of surface using parallel line method.	14M	4	3
Q.5(A)	Draw the front view, top view and right side view of the following object. Use first angle projection.	14M	5	3

OR

Q.5(B)   Draw the isometric view of the object, the multi view projection of which   14M   5   3
is shown below:

Front View:

Side View:

Top View:

*** END***

Hall Ticket No:

Question Paper Code: 23ME101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B. Tech I Year I & II Semesters (R23) Supplementary End Semester Examinations, January – 2025
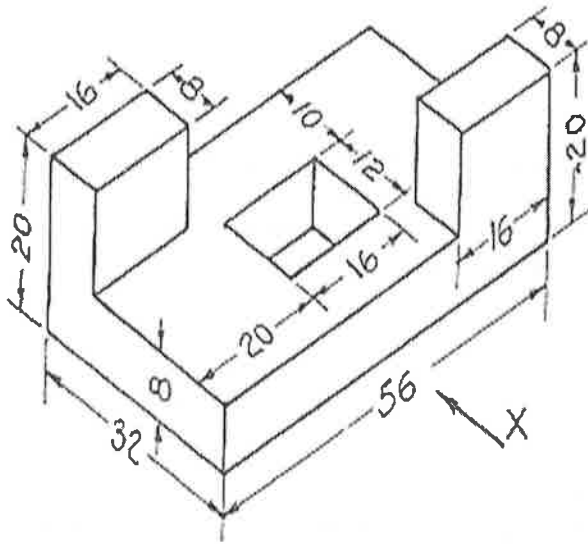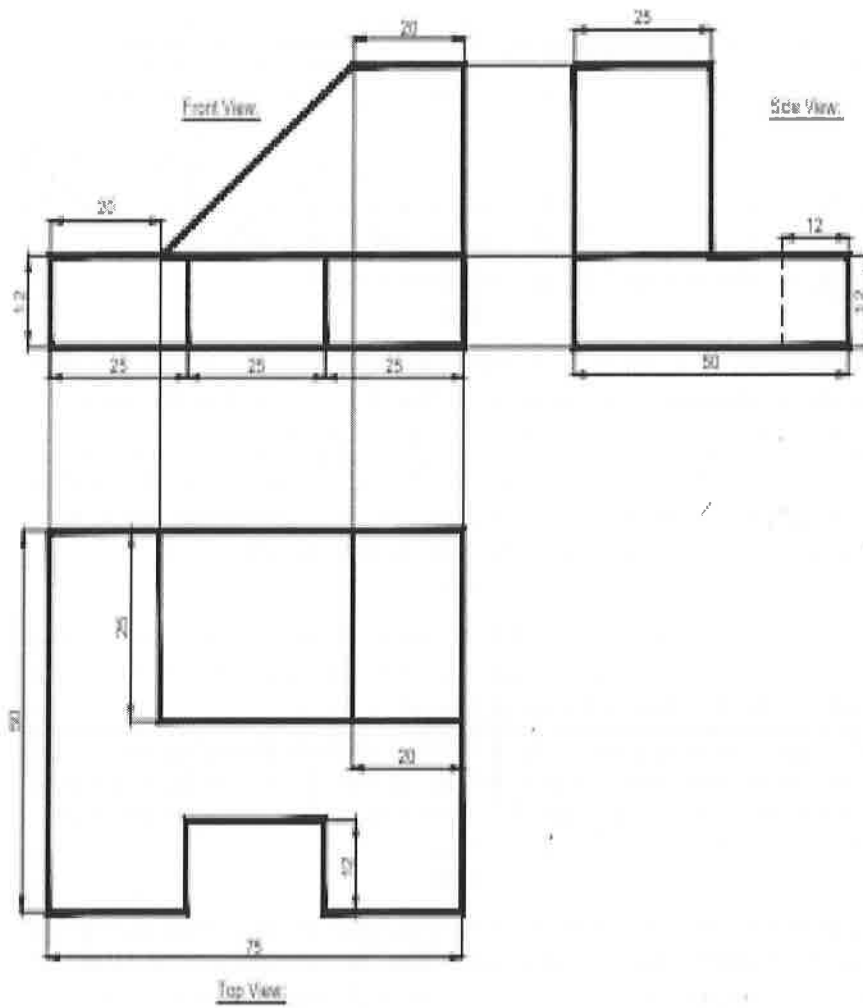## ENGINEERING GRAPHICS
(Common to All)

Time: 3Hrs

Max Marks: 70

Attempt all the questions. All parts of the question must be answered in one place only.
In Q.no 1 to 5 answer either **Part-A or B only**

Q.No	Question	Marks	CO	BL
Q.1(A)	Construct a parabola with the distance of the focus from the directrix is 50 mm. Also, draw the tangent and normal to the curve at a distance 40 mm from directrix.	14M	1	3
	OR			
Q.1(B)	Draw the involute of regular Pentagon 40 mm side. Also, draw a tangent and normal to the curve at a point 100 mm from centre of the pentagon.	14M	1	3
Q.2(A)	Draw the projections of the following points on the same ground line, keeping the distance between the projectors is 50mm, Name the quadrants in which they lie. 1. Point A, 30 mm in front of V.P. and 45 mm above the H.P. 2. Point B, 30 mm below the H.P. and 40mm behind the V.P. 3. Point C, 30mm above the H.P. and 25mm behind the V.P. 4. Point D, on the H.P and 25mm behind the V.P.	14M	2	3
	OR			
Q.2(B)	Draw the projections of a circle of 50mm diameter resting in the HP one point on the circumference. Its plane is inclined at 45° to the HP and the top view of the diameter making an angle of 30° with the VP.	14M	2	3
Q.3(A)	Draw the projections of a hexagonal pyramid with a base side of 30 mm and an axis length of 60 mm. The base rests on the horizontal plane and the axis is inclined at 45° to the H.P and parallel to the V.P.	14M	3	3
	OR			
Q.3(B)	A Pentagonal prism, having a base with a 30mm side and an 70mm long axis, rests on one of its rectangular face in the H.P such that the axis is inclined at 30⁰ to the VP. Draw its projections?	14M	3	3
Q.4(A)	A hexagonal prism, 30 mm base side & 60 mm axis is standing on HP on its base whose two sides are perpendicular to VP. It is cut by a section plane 45⁰ inclined to HP, through mid-point of axis. Draw Front view, sectional Top view and true shape of section.	14M	4	3
	OR			
Q.4(B)	A hexagonal prism of side of base 30 mm and axis 70 mm long is resting on its base on H.P. such that a rectangular face is parellel to V.P. It is cut by a section plane perpendicular to V.P and inclined at 30⁰ to H.P. The section plane is passing through the axis at a height of 35mm from the base. Draw the development of the lateral surface of the cut prism.	14M	4	3
Q.5(A)	Draw the front view, top view and left side view of the following isometric view. Use first angle projection.	14M	5	3

OR

Q.5(B)   Draw the isometric view of the below orthographic view: 14M   5   3

Front View.

Side View.

Top View.

*** END***

Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐   Question Paper Code: 23ME101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B. Tech I Year I & II Semesters (R23) Supplementary End Semester Examinations, January – 2025
ENGINEERING GRAPHICS
(Common to All)

Time: 3Hrs   Max Marks: 70

Attempt all the questions. All parts of the question must be answered in one place only.
In Q.no 1 to 5 answer either **Part-A or B only**

Q.No	Question	Marks	CO	BL
Q.1(A)	Construct a hyperbola when the distance between the focus and directrix is 45 mm and eccentricity is 5/4. Also, draw the tangent and normal to the curve at a point 30 mm from the directrix.	14M	1	3
	OR			
Q.1(B)	A circle of 40 mm diameter rolls along a straight line for one revolution clockwise. Draw the locus of a point on the circle which is contact with line. Also, draw tangent and normal to the curve at a point 30 mm from directing line.	14M	1	3
Q.2(A)	Draw the projections of the following points on the same ground line, keeping the distance between the projectors is 50mm, Name the quadrants in which they lie. 1. Point E, 30 mm in front of V.P. and 45 mm above the H.P. 2. Point F, 30 mm below the H.P. and 40mm behind the V.P. 3. Point G, 30mm above the H.P. and 25mm behind the V.P. 4. Point H, on the H.P and 25mm behind the V.P.	14M	2	3
	OR			
Q.2(B)	A Pentagonal lamina of 30 mm sides is resting on HP on one of its sides with its surface 45^0 inclined to HP. Draw the projections of the lamina when the side in HP makes 35^0 angle with VP.	14M	2	3
Q.3(A)	A Hexagonal Pyramid of base side 30mm and axis 60mm has a corner of its base on the ground. Its axis is inclined at 30° to the ground and parallel to VP. Draw its Projections.	14M	3	3
	OR			
Q.3(B)	A Cylinder of 50 mm diameter and 60 mm axis is resting on one point of a base circle on VP while its axis makes 45^0 with VP and parallel to HP. Draw its projections.	14M	3	3
Q.4(A)	A Cylinder of base 50mm and axis 60mm is resting on ground with its axis vertical. It is cut by a section plane perpendicular to VP and inclined at 35° to HP passing through the top of the generator and cuts all other generators. Draw the development of surface using parallel line method.	14M	4	3
	OR			
Q.4(B)	A square pyramid, base 40 mm side and axis 75 mm long, has its base on the HP and all the edges of the base equally inclined to the VP. It is cut by a section plane, perpendicular to the VP, inclined at 45^0 to the HP and bisecting the axis. Draw its sectional top view, sectional front view and true shape of the section.	14M	4	3
Q.5(A)	Draw the front view, top view and left side view of the following object. Use first angle projection.	14M	5	3

OR

Q.5(B)   Draw the isometric view of the below,orthographic view: 14M   5   3

*** END***

Hall Ticket No: [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]   Question Paper Code: 23CE101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B. Tech I Year II Semester (R23) Supplementary End Semester Examinations, January– 2025
ENGINEERING MECHANICS
### (Civil Engineering)

Time: 3Hrs   Max Marks: 70

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

Q. No		Question	Marks	CO	BL
Q.1	i.	Discuss about Newton's law of gravitation.	1M	1	1
	ii.	Explain the terms: (a) Concurrent and, (b) Non-concurrent forces.	1M	1	2
	iii.	What is free body diagram? Explain.	1M	2	2
	iv	Discuss about Lami's theorem.	1M	2	2
	v.	What do you understand by centroid of a body?	1M	3	1
	vi	Write the formula for moment of inertia of a circular section.	1M	3	1
	vii.	Define in brief about erratic motion.	1M	4	1
	viii.	Discuss the term impulse and momentum?	1M	4	1
	ix.	What is work and energy?	1M	5	1
	x.	Explain in brief about D'Alembert's Principle.	1M	5	1
Q.2(A)		Particle 'O' is acted on by the following forces: i) 20 N inclined 30 degree to north of east ii) 25 N towards the north iii) 30 N towards north west iv) 35 N inclined 40 degree to south of west Find the resultant?	12M	1	4

OR

Q.2(B)		A 400 kN block is resting on a rough horizontal surface for which the coefficient of friction is 0.30. Determine the force P required to cause motion to impend if applied to the block (a) horizontally or (b) downward at 30° with the horizontal. (c) What minimum force is required to start motion?	12M	1	4

400 kN
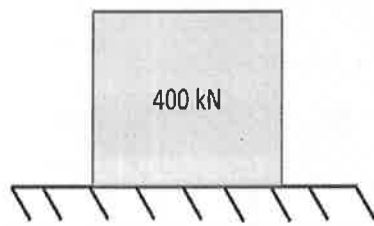
|					
Q.3(A)		A 400 N sphere is resting in a trough as shown in fig below. Draw the free body diagram and determine the reactions developed at contact surfaces. Assume all contact surfaces are smooth.	12M	2	4

60°   45°
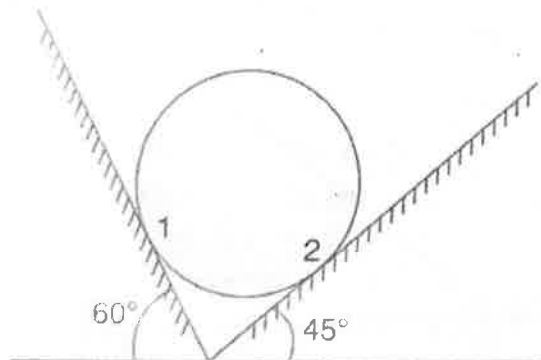
OR

Q.3(B)   A string ABCD, attached to two fixed points A and D has two equal weights   12M   2'   4
of 1000 N attached to it at B and C. The weights rest with the portions AB
and CD inclined at angles of 30° and 60° respectively, to the vertical as
shown in fig. Find the tensions in the portions AB, BC and CD of the string,
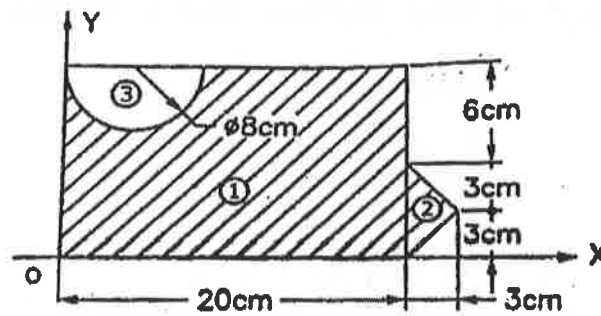if the inclination of the portion BC with the vertical is 120°.
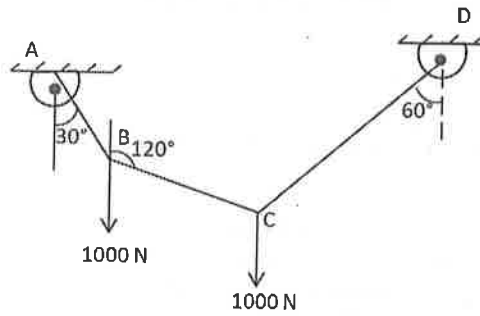
Q.4(A)   Determine the moment of inertia of the symmetrical Channel section shown   12M   3   4
in Figure with respect to its centroidal axes.
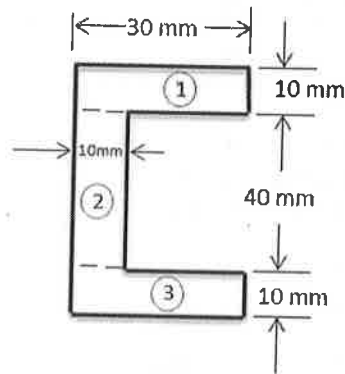
OR

Q.4(B)   Locate the Centroid of the Plane lamina as shown in figure.   12M   3   4

Q.5(A)   A bicycle moves along a straight road such that its position is described by   12M   4   3
the graph shown in figure. Construct the u t and a-t graph for $0 \leq t \leq 30$ sec
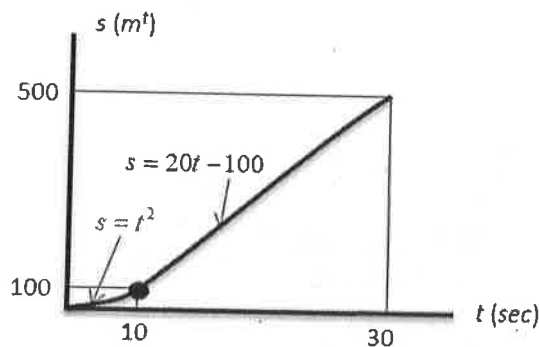
OR

| Q.5(B) | A body weighting 300 N is pushed up a 30° plane by a 40 N force acting parallel to the plane. If the initial velocity of the body is 1.5 m/s and coefficient of kinetic friction is 0.2, what velocity will the body have after moving of 6 m? | 12M | 4 | 4 |

| Q.6(A) | A 50 kg block rests on a horizontal floor for which coefficient of friction is 0.3. If a block is subjected to a force of 400 N as shown in figure, find velocity of a block (in m/sec^2) after 3 sec. Assume , a = 10 m/sec^2. | 12M | 5 | 3 |
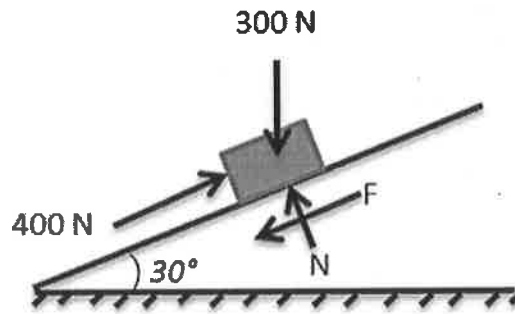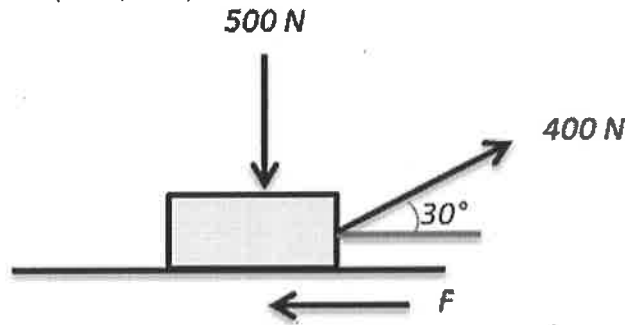
OR

| Q.6(B) | A wheel rotating about a fixed axis at 20 revolutions per minute is uniformly accelerated for 70 seconds during which it makes 50 revolutions. Find the (i) angular velocity at the end of this interval and (ii) time required for the velocity to reach 100 revolutions per minute. | 12M | 5 | 4 |

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B. Tech I Year II Semester (R23) Supplementary End Semester Examinations, January – 2025

ELECTRICAL CIRCUIT ANALYSIS -I

(Electrical & Electronics Engineering)

Time: 3Hrs   Max Marks: 70

> Attempt all the questions. All parts of the question must be answered in one place only.
> **All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only**

| Q.No		Question	Marks	CO	BL
Q.1	i.	Two resistances are connected in parallel with values 6Ω & 3Ω. This combination is connected in series with 8Ω. Find the equivalent resistance.	1M	1	1
	ii.	Write the Voltage – Current relationship for passive elements.	1M	1	1
	iii.	State Faraday's law of electromagnetic induction.	1M	2	1
	iv.	Define reluctance.	1M	2	1
	v.	If the load impedance is 20 + j20, what is the power factor of the circuit?	1M	3	1
	vi	Define RMS value.	1M	3	1
	vii.	State the dot convention rule for magnetically coupled circuits.	1M	4	1
	viii.	Define quality factor.	1M	4	1
	ix.	State Superposition theorem.	1M	5	1
	x.	State Maximum power transfer theorem for DC circuits.	1M	5	1
Q.2(A)		i) Obtain the equivalent resistance Rab of the circuit shown.	6M	1	5
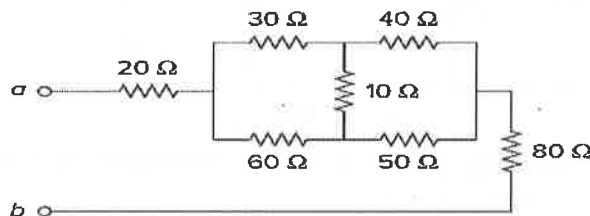
		ii) Explain Kirchhoff's laws with appropriate example.	6M	1	2

OR

Q.2(B)		i) Derive the expression for equivalent resistance of two resistors connected in Parallel.	6M	1	3
		ii) Write short notes on source transformation.	6M	1	2
Q.3(A)		The magnetic circuit of Fig. has cast steel core with dimensions as shown: Mean length from A to B through either outer limb = 0.5 m. Mean length from A to B through the central limb = 0.2 m In the magnetic circuit shown it is required to establish a flux of 0.75 mWb in the air-gap of the central limb. Determine the mmf of the exciting coil if for the core material μr = 5000. Neglect fringing.	12M	2	5
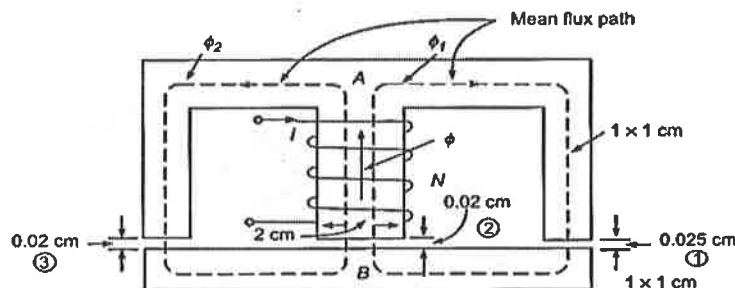
Q.3(B)	From the fundamental principles, derive the expression for self-inductance, mutual inductance and co-efficient of coupling.	12M	2	3
Q.4(A)	A resistance of 16 Ω is connected in parallel to an inductance of 20 mH and the parallel combination is connected to an AC supply of 230 V, 50 Hz. Determine the impedance of the circuit, input current, current through each branch, power factor of the circuit, real power, reactive power, apparent power and draw the phasor diagram.	12M	3	5

OR

Q.4(B)	Determine the Average value, RMS value, Form factor and Peak factor of a sinusoidal signal.	12M	3	2
Q.5(A)	State the dot convention rule for magnetically coupled circuits. Determine the expression for equivalent inductance of two magnetically coupled coils connected in (a) series opposing (b) parallel opposing.	12M	4	3

OR

Q.5(B)	Derive the expression for resonant frequency and bandwidth for a series RLC resonant circuit.	12M	4	4
Q.6(A)	State and verify the reciprocity theorem for the circuit shown below:	12M	5	5
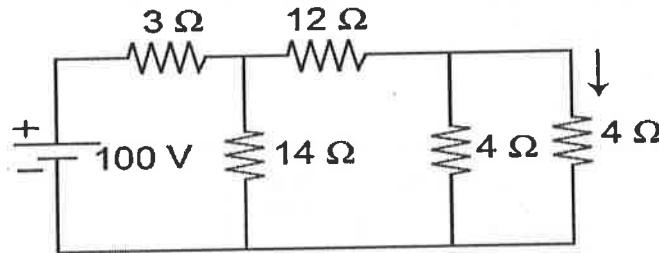
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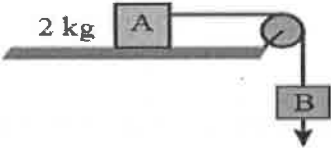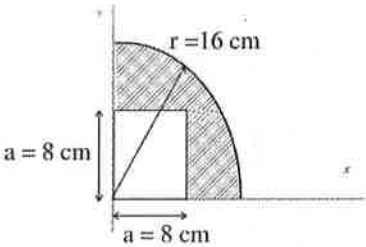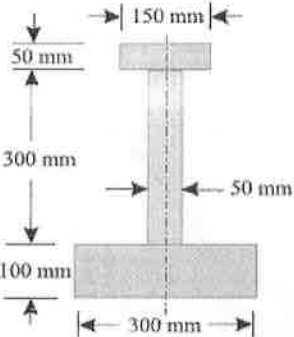|				
Q.6(B)	(i) State Thevenin's theorem and explain the procedure to obtain the Thevenin equivalent circuit.	6M	5	2
	(ii) For the circuit shown in Fig., using Thevenin's theorem, determine the current in the 10-ohm resistor.	6M	5	5
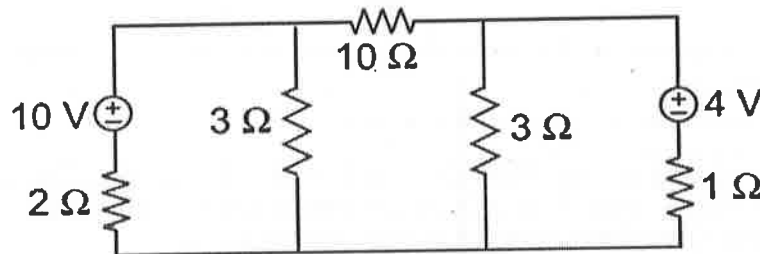
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MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)

B. Tech I Year II Semester (R23) Supplementary End Semester Examinations, January – 2025

ENGINEERING MECHANICS
(Mechanical Engineering)

Time: 3Hrs   Max Marks: 70

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

Q.No		Question	Marks	CO	BL
Q.1	i.	State Varignon's Theorem?	1M	1	1
	ii.	Why coefficient of friction is a unit less quantity?	1M	1	2
	iii.	What is mean by FBD	1M	2	1
	iv.	Define truss , give example	1M	2	1
	v.	State Lami's theorem	1M	3	1
	vi	What is centroid of an object?	1M	3	1
	vii.	Define parallel axis theorem.	1M	4	1
	viii.	What is meant by D. Alembert's principle	1M	4	2
	ix.	What is the SI unit of angular velocity?	1M	5	2
	x.	What is the difference between translation motion and rotational motion?	1M	5	2
Q.2(A)		It is required that the resultant force acting on the eyebolt, as shown in Fig. be directed along the positive x axis and that F_2 have a minimum magnitude. Determine this (F_2) magnitude, the angle θ, and the corresponding resultant force. $F_x = -800N$	12M	1	3
		OR			
Q.2(B)		A block weighing 981 N is resting on a horizontal surface. The coefficient of friction between the block and the horizontal surface is μ=0.2. A vertical cable attached to the block provides partial support as shown in fig. A man can pull horizontally with a force of 100 N. What will be the tension, T (in N) in the cable if the man is just able to move the block to the right?	12M	1	3
Q.3(A)		A light string ABCDE whose extremity A is fixed, has weights W1 and W2 attached to it at B and C respectively. It passes round peg at D carrying a weight of 300 N at the free end E as shown in figure. The entire system is in the equilibrium. Find tension in the portion AB, BC and CD of the string. Also, find magnitude of W1 and W2.	12M	2	3

		OR			
Q.3(B)	The coefficient of static friction, μs, between block A of mass 2 kg and the table as shown in the figure is 0.2. What would be the maximum mass value of block B so that the two blocks do not move? The string and the pulley are assumed to be smooth and massless. (g=10 m/s²)	12M	2	5
Q.4(A)	Locate the centroid of the shaded area.	12M	3	4
		OR			
Q.4(B)	An I section has the following dimension in mm units: Bottom flange = 300 × 100, Top flange = 150 × 50, Web = 300 × 50. Determine mathematically the position of centroid of the section.	12M	3	4
Q.5(A)	An elevator of mass 3000 kg is moving vertically upward with a constant acceleration. Starting from the rest it travels a distance of 40 m during an interval of 10 s. Find the cable tension during this time. g=10 m/s²	12M	4	3
		OR			
Q.5(B)	A ball of mass 1 kg moving with a velocity of 3 m/sec strikes a ball of 5 kg moving with a velocity of 0.6 m/sec in the same direction. If the coefficient of restitution is (e)= 0.75, Find the loss in kinetic energy.	12M	4	3
Q.6(A)	A uniform disc of mass 100g has a diameter of 10 cm. Calculate the total energy of the disc when rolling along a horizontal table with a velocity of 20 cms-1	12M	5	4
		OR			
Q.6(B)	A solid cylinder of mass 20 kg rotates about its axis with angular speed 100 rad s-1. The radius of the cylinder is 0.25 m. What is the kinetic energy associated with the rotation of the cylinder? Also, calculate the magnitude of angular momentum of the cylinder about its axis.	12M	5	3
		*** END***			

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)

B. Tech I Year II Semester (R23) Supplementary End Semester Examinations, January – 2025
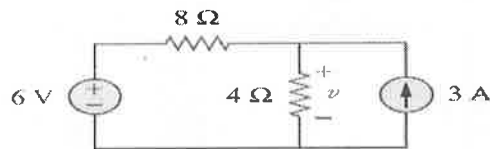
NETWORK ANALYSIS
(Electronics & Communication Engineering)

Time: 3Hrs   Max Marks: 70

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

| Q.No		Question	Marks	CO	BL
Q.1	i.	Define the mesh, node, junction and branch.	1M	1	1
	ii.	State the Reciprocity theorem.	1M	1	1
	iii.	What is the Laplace transformation of the unit impulse function?	1M	2	1
	iv.	What happens to the voltage across a capacitor immediately after a switch is closed in an RC circuit excited with a DC source? Will it change quickly? Yes or no. Explain.	1M	2	2

	v.	Convert into polar form ($r\angle\theta$)
		    i) $3+j4$
		    ii) $3-j4$
			1M	3	2

	vi	A series RL circuit has R = 4 Ω and L = 0.01 H. Find the impedance at 100Hz.	1M	3	2
	vii.	Write the expression for resonant frequency in series resonance.	1M	4	1
	viii.	"Parallel resonance is also called anti-resonance." explain this statement.	1M	4	2
	ix.	Why is the h-parameter called a hybrid parameter?	1M	5	1
	x.	What do you understand by iterative and image impedance in network.	1M	5	1
Q.2(A)		State superposition theorem. Write the steps to solve the network problem using the superposition theorem. Use this theorem to find voltage drop, v, across 4 Ω resistance.	12M	1	3

OR

Q.2(B)		Evaluate the power transferred to the load for a circuit with a Thevenin equivalent voltage of 10V and a Thevenin equivalent resistance of 5Ω. Calculate the power transferred to the load for load resistances of 1Ω, 5Ω, and 10Ω. Determine the load resistance that results in maximum power transfer. Write your conclusion after analyzing the results.	12M	1	4
Q.3(A)		What do you understand about 'transient'? Obtain a transient response of a series R-L circuit with a DC source as excitation. What is a time constant?	12M	2	2

OR

|					
Q.3(B)		(i) Obtain the current expression for a series RC circuit with a DC source using Laplace transformation. (ii) What is the current value after 5s in the following circuit after the switch is closed when V = 10V, R= 2Ω and C = 4µF.	12M	2	3
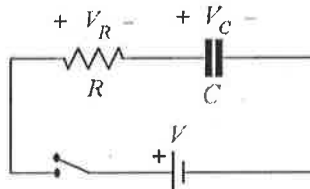
Q.4(A)	Define the alternative and direct voltage with a suitable diagram. In a series R-L circuit, the current and voltage are given as: $$i = 1\cos(314t - 20^0), \qquad v = 10\cos(314t + 10^0)$$ Find the value of R and L.	12M	3	3

OR

Q.4(B)	(i) Find the transfer function (V_2/V_1) for the network shown in the figure using Mesh analysis.	6M	3	3
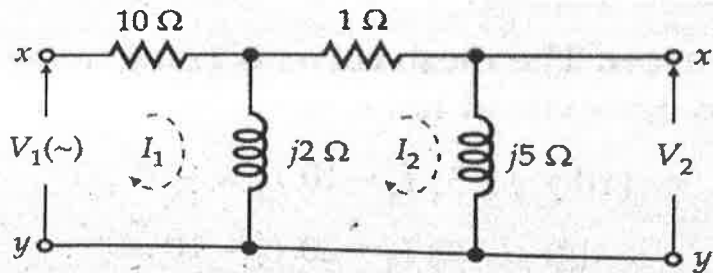
	(ii) Find the equivalent star network from the circuit given below:	6M	3	3
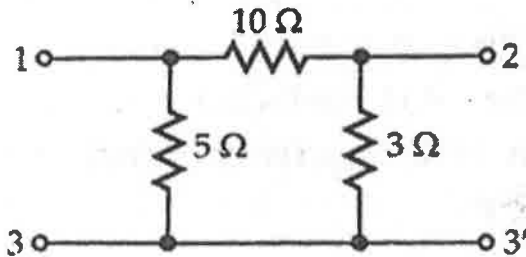
Q.5(A)	What do you understand by the bandwidth of a series resonating circuit? Derive and establish the expression that relates to Q-factor, Bandwidth and Resonance frequency.	12M	4	2

OR

Q.5(B)	Write the mesh equation of the transformer circuit as shown below:	12M	4	3
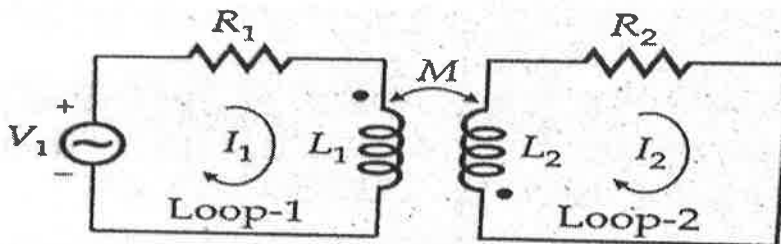
Q.6(A)	Z parameters of the circuit are given as $Z_{11} = 4$. $Z_{12}= 3$, $Z_{21}= 3$, $Z_{22}=4$. Obtain Y Parameters, h parameters and transmission parameters.	12M	5	3

OR

Q.6(B)	(i) Explain different types of two-port network parameters with suitable diagrams, equations and matrices.	6M	5	3
	(ii) Is it possible to find the values of one type of parameter from the values of another type of parameter? Explain with an example of your choice.	6M	5	3

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B. Tech I Year II Semester (R23) Supplementary End Semester Examinations, January – 2025
DATA STRUCTURES
(Common to CSE, CST, AI, DS, CS, AIML, NW)

Time: 3Hrs   Max Marks: 70

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

Q.No		Question	Marks	CO	BL
Q.1	i.	List out the various applications of data structures.	1M	1	2
	ii.	Write the best and worst case complexity of linear search.	1M	1	1
	iii.	Give the syntax of malloc() and use it to create a node in Single Linked List.	1M	2	1
	iv.	Write the algorithm for PUSH operation.	1M	2	1
	v.	What is stack? List out the various operations.	1M	3	1
	vi	What is backtracking? List out the various applications.	1M	3	1
	vii.	What is perfect binary tree?	1M	4	1
	viii	What is Heap Sort?	1M	4	1
	ix.	Define biconnected graph.	1M	5	1
	x.	How to calculate the hash key? Give the example.	1M	5	1
Q.2(A)		Interpret an algorithm to sort a set of 'N' numbers using bubble sort and demonstrate the sorting steps for the following set of numbers: 30, 52, 29, 87, 63, 27, 19, 54.	12M	1	4
		OR			
Q.2(B)		Explain Bubble sort algorithm with examples.	12M	1	3
Q.3(A)		Examine the algorithms to implement the singly linked list and perform all the operations on the created list.	12M	2	4
		OR			
Q.3(B)		Develop the algorithms for implementing Stack operations using array and linked list.	12M	2	3
Q.4(A)		Discuss the Queue implementation using arrays.	12M	3	4
		OR			
Q.4(B)		Develop the suitable code to perform the operations in double ended queues with examples.	12M	3	2
Q.5(A)		Discuss the property of Binary Search Tree and Create a binary search tree using the following data elements 45,39, 56, 12, 34, 78, 32, 10, 89, 54, 67, 81 and Show deletion of nodes 81 and 78.	12M	4	4
		OR			
Q.5(B)		Illustrate the construction of binomial heaps and its operations with a suitable example	12M	4	3
Q.6(A)		Given input {4371, 1323, 6173, 4199, 4344, 9679, 1989} and a hash function h(x) =x mod 10. Prepare the resulting for the following: (a) Separate Chaining method. (b) Open addressing hash table using linear probing. (c) Open addressing hah table using quadratic probing.	12M	5	4
		OR			
Q.6(B)		What is hashing? Explain in detail about Collision resolution techniques with suitable examples.	12M	5	3

*** END***