Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 23MAT101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS INSTITUTION)

B. Tech I Year I Semester (R23) Supplementary End Semester Examinations, May – 2026

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

S.No.		Question	Marks	CO	BL
1.	i)	Determine the value of k if the rank of the matrix $\begin{bmatrix} 1 & 2 & 3 \\ 2 & k & 7 \\ 3 & 6 & 10 \end{bmatrix}$ is 2	1	1	2
	ii)	Find the inverse of the matrix $A=\begin{bmatrix} 1 & 0 \\ 1 & 2 \end{bmatrix}$ by Gauss-Jordan method.	1	1	2
	iii)	Find the eigenvalues of A^{-1} for the matrix $A=\begin{bmatrix} -3 & 6 & 7 \\ 0 & 2 & 6 \\ 0 & 0 & 5 \end{bmatrix}$	1	2	2
	iv)	Consider the matrix A of order 3×3 with eigenvalues 1, 5 and trace of A is 9. Find the determinant of the matrix.	1	2	2
	v)	Determine the value of c for the function $f(x)=x^2$ in $[2,3]$	1	3	2
	vi)	write the Maclaurin's series of $f(x)=e^{-x}$	1	3	1
	vii)	Find $\frac{\partial f}{\partial x}$ and $\frac{\partial f}{\partial y}$, if $f(x,y)=\ln(7x+5y)$	1	4	2
	viii)	When the function $f(x,y)$ has saddle point at (a,b)	1	4	2
	ix)	Evaluate $\iint_R dA$, when $0\le x\le 2, 0\le y\le 3$	1	5	2
	x)	Evaluate $\iint_R dA$, when $0\le r\le 2, 0\le \theta\le 2\pi$	1	5	2
2(A)	(i).	Reduce the following matrix $A=\begin{bmatrix} 2 & 3 & -1 & -1 \\ 1 & -1 & -2 & -4 \\ 3 & 1 & 3 & -2 \\ 6 & 3 & 0 & -7 \end{bmatrix}$ into Normal form and hence find the rank	6	1	3
	(ii).	Investigate for what values of λ and μ so that the equations $2x+3y+5z=9$; $7x+3y-2z=8$; $2x+3y+\lambda z=\mu$ have (i) unique solution, (ii) infinite solutions	6	1	3
		OR			
2(B)		Solve the system $20x+y-2z=17$; $3x+20y-z=-18$; $2x-3y+20z=25$ by Jacobi's iteration method.	12	1	3
3(A)		Reduce the matrix $A=\begin{bmatrix} 3 & -1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 3 \end{bmatrix}$ to the diagonal form.	12	2	3
		OR			

3(B)		Verify Cayley-Hamilton theorem, and hence find the Inverse and A^4 of the matrix $A=\begin{bmatrix}1 & 0 & 3\\ 2 & 1 & -1\\ 1 & -1 & 1\end{bmatrix}$	12	2	3
4(A)	(i).	Verify Lagrange's mean value theorem for the following function $f(x)=\log_e x$ in $[1,e]$.	6	3	3
	(ii).	Find the Maclaurin's theorem with Lagrange's form of remainder for $f(x)=\cos x$	6	3	3
		OR			
4(B)		Expand $\sqrt{1+\sin x}$ by Maclaurin's series up to the term containing x^6.	12	3	3
5(A)	(i).	If $u=f(r,s,t)$ and $r=\frac{x}{y}$, $s=\frac{y}{z}$, $t=\frac{z}{x}$. Prove that $x\frac{\partial u}{\partial x}+y\frac{\partial u}{\partial y}+z\frac{\partial u}{\partial z}=0$	6	4	3
	(ii).	If $u=x+y+z$, $uv=y+z$, $uvw=z$, show that $\frac{\partial(x,y,z)}{\partial(u,v,w)}=u^2v$.	6	4	3
		OR			
5(B)		Discuss the extreme values for $f(x,y)=x^3+3xy^2-15x^2-15y^2+72x$	12	4	3
6(A)	(i).	Evaluate the integral $\int_0^1\int_x^{\sqrt{2-x^2}}\frac{x}{\sqrt{x^2+y^2}}dydx$ by changing the order of Integration.	6	5	3
	(ii).	Find the area lying inside the circle $r=a\sin\theta$ and outside the cardioid $r=a(1-\cos\theta)$	6	5	3
		OR			
6(B)	(i).	Evaluate $\int_{-1}^{1}\int_{0}^{z}\int_{x-z}^{x+z}(x+y+z)\,dydxdz$	6	5	3
	(ii).	Changing into cylindrical coordinates, evaluate $\iiint_D z(x^2+y^2)dxdydz$ $D: x^2+y^2\le 1, 2\le z\le 3$.	6	5	3

*****END*****

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 23CHE102

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS INSTITUTION)

B. Tech I Year I & II Semester (R23) Supplementary End Semester Examinations, May – 2026

CHEMISTRY

(Common to EEE, ECE, CSE, CST, CAI, CSD, CSC, and CSN)

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.	Write down the expression for time independent Schrodinger wave equation	1M	1	2
	ii.	Number of nodes present in HOMO level of 1,3 butadiene is.....	1M	1	2
	iii.	What are the majority, and minority charge carriers in N-type semiconductors?	1M	2	2
	iv.	Surface to volume ratio of nanomaterials is.....when compared to bulk material	1M	2	2
	v.	Draw the typical graph for the conductometric titration of strong acid vs. strong base	1M	3	2
	vi	Name the electrolyte used in Li-ion battery	1M	3	2
	vii.	The monomers of Buna-N rubber are.....	1M	4	2
	viii.	Give any one application of carbon fiber	1M	4	1
	ix.	How is energy(E) related to frequency (ν), wavelength (λ)?	1M	5	2
	x.	Write the Hooke's law	1M	5	2
Q.2(A)		Derive the equations for wavefunction and energy for particles in a one-dimensional box and explain the terms	12M	1	2
		OR			
Q.2(B)		(a) Draw the molecular diagram (MO) of oxygen (O_2) molecule	6M	1	2
		(b) Explain the Pi-molecular orbital (π-MO) theory of 1,3-butadiene with a neat diagram	6M	1	2
Q.3(A)		Explain the formation of cooper pairs according to BCS theory, and list down the applications of superconductors	12M	2	3
		OR			
Q.3(B)		(a) Construct and explain electrostatic double layer and hybrid supercapacitors with neat sketch	8M	2	3
		(b) Explain any four properties of Carbon nanotubes	4M	2	2
Q.4(A)		Apply potentiometric titration principle to the following redox system Hg/Hg_2Cl_2 (s)$\|\|Fe^{3+}$, Fe^{2+} / Pt by any suitable oxidizing agent	12M	3	3
		OR			
Q.4(B)		(a) Derive Nernst equation	6M	3	2
		(b) Illustrate and elucidate the electrochemical processes occurring in H_2-O_2 fuel cell	6M	3	3
Q.5(A)		(a) Explain the coordination addition polymerization with a suitable example	6M	4	2
		(b) What are conducting polymers? Explain the reductive doping conduction mechanism in polyacetylene molecule	6M	4	2
		OR			
Q.5(B)		Explain the mechanism involved in the preparation of Bakelite, and list down the applications of Bakelite	12M	4	2
Q.6(A)		Explain the principle, instrumentation, and applications of UV-Visible spectroscopy	12M	5	2
		OR			
Q.6(B)		Write down the classification, principle, instrumentation and applications of the HPLC technique	12M	5	2

***** END*****

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 23CHE101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS INSTITUTION)

B. Tech I Year I & II Semester (R23) Supplementary End Semester Examinations, May – 2026

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.	Differentiate between priming & foaming.	1 M	1	2
	ii.	Define reverse osmosis.	1 M	1	1
	iii.	What are electrochemical cells?	1 M	2	1
	iv	Write Nernst equation.	1 M	2	2
	v.	Name the monomers used in the synthesis of Nylon 6,6.	1 M	3	1
	vi	What do you mean by Octane number?	1 M	3	2
	vii.	Compare flash & fire point of lubricants.	1 M	4	1
	viii	Give two examples for refractory material.	1 M	4	1
	ix.	Define nanomaterial with suitable example.	1 M	5	2
	x.	What are micelles?	1 M	5	1
Q.2(A)		What is hardness? Draw the structure of EDTA. Explain how the permanent hardness of water is determined using complexometric titration?	12 M	1	2
		OR			
Q.2(B)		Illustrate Ion-exchange process with a neat sketch.	12 M	1	2
Q.3(A)		Explain the working principle, advantages and applications of the Zinc-Air battery.	12 M	2	2
		OR			
Q.3(B)		What is corrosion? Discuss the factors affecting the rate of corrosion.	12 M	2	2
Q.4(A)		Explain the synthesis, application and properties of BUNA-S & BUNA-N.	12 M	3	2
		OR			
Q.4(B)		Brief out the proximate & ultimate analysis of coal.	12 M	3	3
Q.5(A)		What is refractory material? Discuss various factors affecting the refractoriness of the material.	12 M	4	2
		OR			
Q.5(B)		Describe the manufacture of Portland cement with a neat diagram.	12 M	4	2
Q.6(A)		Discuss the precipitation method for the synthesis of nanomaterials.	12 M	5	2
		OR			
Q.6(B)		Derive the Langmuir adsorption isotherms.	12 M	5	3

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 23ENG101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS INSTITUTION)

B. Tech I Year I & II Semesters (R23) Supplementary End Semester Examinations, May – 2026

COMMUNICATIVE 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.	What is the difference between skimming and scanning?	1M	1	2
	ii.	Arrange the words to form a correct sentence: school / every / I / day / go / to	1M	1	2
	iii.	Fill in the blank with a suitable article: She is _____ honest person.	1M	2	2
	iv.	Give the homophone for the word 'flour' and use it in a sentence.	1M	2	2
	v.	What is note-making?	1M	3	1
	vi	Fill in the blank with the correct form of the verb: She _____ (go) to school every day.	1M	3	1
	vii.	Rewrite the following sentence in passive voice: **The teacher teaches the students.**	1M	4	2
	viii.	Fill in the blank with the correct word from the brackets: I am allergic _____ peanuts. (to / for / of)	1M	4	1
	ix.	What is intrapersonal communication? Give one example.	1M	5	1
	x.	Rewrite the following sentence correctly: **Her father name is Shankar.**	1M	5	2
Q.2(A)		Describe the characters of Jim and Della from 'The Gift of the Magi'. What sacrifice did each of them make? Write in about 300 words.	12M	1	3
		OR			
Q.2(B)		(i) Identify the parts of speech of the underlined words in the following sentences: a. The *little* girl ran quickly *across* the field. b. He is *very* smart and *works* hard every day. c. *Wow*! That *was* a fantastic performance. (ii) Write one synonym for each of the following words: a. happy, b. difficult, c. brave, d. honest, e. beautiful, f. fast	12M	1	2
Q.3(A)		Write descriptive paragraphs of about 150 words each on the following topics: (i) My Favourite Season (ii) The Importance of Drinking Water	12M	2	3
		OR			
Q.3(B)		Describe the journey of the brook as described by Alfred Tennyson in the poem 'The Brook'. Write in about 300 words.	12M	2	3
Q.4(A)		Write a summary of the life and achievements of Elon Musk in about 300 words.	12M	3	4
		OR			
Q.4(B)		(i) Write two examples each for any six tenses. (ii) Fill in the blanks with the correct forms of the verbs in brackets. Include helping verbs (be, have), if necessary.	12M	3	2

a. She _____ (read) a novel at the moment.
b. They _____ (not finish) their homework yet.
c. Water _____ (boil) at 100°C.
d. He _____ (play) cricket every evening.
e. I _____ (visit) my grandparents last Sunday.
f. Look! The children _____ (dance) on the stage.

Q.5(A)	Write a formal letter to the principal of your college requesting permission to organize a cultural event. Include details such as the name of the event, date, venue, and purpose. (Write in about 250 words.)	12M	4	3
	OR			
Q.5(B)	Did Eleanor and Harvey fail in their efforts to promote peace toys to the children. Write your answer in 300 words.	12M	4	3
Q.6(A)	What is intrapersonal communication? How does it help us in our daily life and career? Explain with examples. Write in about 300 words.	12M	5	3
	OR			
Q.6(B)	Write an essay on how technology has changed the way we live. (Write in about 350 words)	12M	5	4

***** END*****

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 23MAT102

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS INSTITUTION)

B. Tech I Year II Semester (R23) Supplementary End Semester Examinations, May - 2026

DIFFERENTIAL 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

S.No.		Question	Marks	CO	BL
1.	i)	Find the integrating factor of $\frac{dy}{dx} + 3xy = 6$.	1	1	2
	ii)	Check whether $(2xy + y^2)dx + (x^2 + 2xy)dy = 0$ is exact (or) not.	1	1	2
	iii)	Determine the particular integral of $y'' - y = e^x$.	1	2	2
	iv)	Find the Wronskian of $y_1 = \sin 2x, y_2 = \cos 2x$.	1	2	2
	v)	Form the PDE by eliminating a and b from $z = ax + by$.	1	3	1
	vi)	Find the C.F. of $(D^2 - 9D'^2)z = 0$.	1	3	2
	vii)	If $\phi = e^x \sin y$, find $grad\ \phi$.	1	4	2
	viii)	If $F = e^{2x}I + e^{3y}J + e^{4z}K$, find $Div\ F$.	1	4	2
	ix)	Evaluate $\int_C xdx + ydy$ for the path $x = t, y = t^2$, from $t = 0$ to $t = 1$.	1	5	2
	x)	State the Stokes theorem.	1	5	1
2(A)	(i).	Solve the differential equation $\left(1-x^2\right)\frac{dy}{dx} - xy = 1$	6	1	3
	(ii).	Solve the differential equation $xy\left(1+xy^2\right)\frac{dy}{dx} = 1$	6	1	3
		OR			
2(B)	(i).	Solve the differential equation $\left(x^2y - 2xy^2\right)dx - \left(x^3 - 3x^2y\right)dy = 0$	6	1	3
	(ii).	A body is originally at 80°C and cools down to 60 °C in 20 min, the temperature of the air 40 °C. Find the temperature of body after 40 min from the original.	6	1	3
3(A)		Solve the simultaneous linear differential equation $\frac{dx}{dt} + 5x - 2y = t$, $\frac{dy}{dt} + 2x + y = 0$, given that $x = y = 0$ when $t = 0$.	12	2	3
		OR			
3(B)		Solve $y'' - 2y' + y = e^x \log x$ by the method of variation of parameters	12	2	3
4(A)	(i).	Form the Partial Differential Equation by eliminating arbitrary function from $f(x + y + z, x^2 + y^2 + z^2) = 0$	6	3	3
	(ii).	Solve $(y^2 + z^2)p - xyq + zx = 0$	6	3	3
		OR			
4(B)		Solve $(D^3 - 7DD'^2 - 6D'^3)z = e^{3x+y} + \cos(x + 2y)$	12	3	3
5(A)	(i).	If the directional derivative of $\phi = ax^2y + by^2z + cz^2x$, at the point (1,1,1) has maximum magnitude 15 in the direction parallel to the line $\frac{x-1}{2} = \frac{y-3}{-2} = \frac{z}{1}$, find the values of $a, b, and\ c$.	6	4	3
	(ii).	Find the angle between the normal to the surface $xy = z^2$ at the points (4, 1, 2) and (3,3, -3)	6	4	3

OR

5(B)	(i).	Show that $r^{\alpha}R$ is any irrotational vector for any value of α but is solenoidal if $\alpha + 3 = 0$, *where* $R = xI + yJ + zK$, and r is the magnitude of R.	6	4	3
	(ii).	Find div F and curl F at the point (1, 2, 3), given that $F = (3x^2I + 5xy^2J + 5xyz^3K)$	6	4	3
6(A)		Verify Green's theorem for $F = (x^2 + y^2)I - 2xyJ$ taken around the rectangle bounded by the lines $x = \pm a, y = 0, y = 6$.	12	5	3

OR

6(B)		Using divergence theorem, evaluate $\int_S F \cdot dS$, where $F = x^3i + y^3j + z^3k$ and S is the surface of the sphere $x^2 + y^2 + z^2 = a^2$.	12	5	3

*****END*****

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 23CSE101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS INSTITUTION)

B. Tech I Year I Semester (R23) Supplementary End Semester Examinations, May – 2026

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

S.No.		Question	Marks	CO	BL
1.	i)	What is the role of ALU in a computer?	1M	1	1
	ii)	Define algorithm.	1M	1	1
	iii)	Define conditional statement.	1M	2	1
	iv)	Differentiate between while and do-while loops.	1M	2	2
	v)	What is an array?	1M	3	1
	vi)	What is the use of strlen() function?	1M	3	1
	vii)	What is a pointer in C?	1M	4	1
	viii)	What is the purpose of malloc()?	1M	4	1
	ix)	Define function declaration.	1M	5	1
	x)	Define scope of a variable.	1M	5	1
2(A)		Discuss the basic organization of a computer with neat diagram.	12M	1	2
		OR			
2(B)		Write an algorithm, pseudo code, and flowchart to check whether a number is prime or not.	12M	1	3
3(A)		Discuss conditional statements in programming with examples.	12M	2	2
		OR			
3(B)		Write a program to generate multiplication tables using loops.	12M	2	3
4(A)		Write a C program for matrix addition using two-dimensional arrays.	12M	3	3
		OR			
4(B)		Explain different string operations in C with suitable examples.	12M	3	2
5(A)		Explain different operations that can be performed on pointers with suitable examples.	12M	4	2
		OR			
5(B)		Explain dynamic memory allocation in C with suitable examples.	12M	4	2
6(A)		Explain different return types and arguments in functions with suitable examples.	12M	5	2
		OR			
6(B)		Explain commonly used file handling functions with examples.	12M	5	2

END

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 23CE101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS INSTITUTION)

B.Tech I Year II Semester (R23) Supplementary End Semester Examinations, May- 2026

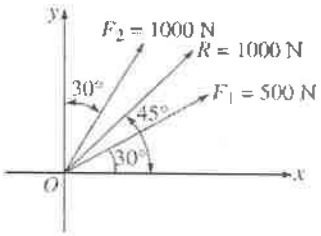
ENGINEERING MECHANICS

(Civil Engineering)

Time: 3Hrs **Max Marks: 70**

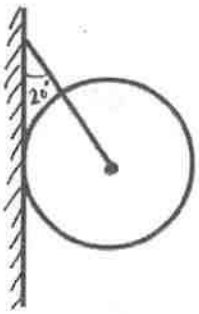
Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

S.No.		Question	Marks	CO	BL
1.	i)	Discuss about Newton's law of gravitation.	1	1	1
	ii)	Explain the terms: (a) Concurrent and, (b) Non-concurrent forces.	1	1	1
	iii)	What is free body diagram? Explain.	1	2	1
	iv)	Discuss about Lami's theorem.	1	2	1
	v)	What do you understand by centroid of a body?	1	3	1
	vi)	Write the formula for moment of inertia of a circular section.	1	3	1
	vii)	Define in brief about erratic motion.	1	4	1
	viii)	Discuss the term impulse and momentum?	1	4	1
	ix)	What is work and energy?	1	5	1
	x)	Explain in brief about D'Alembert's Principle.	1	5	1
2(A)		Two forces acting on a body are 500 N and 1000 N shown in figure. Determine the third force F_3 such that the resultant of all three forces is 1000 N directed at 45° to x-axis as given in the figure.	12	1	5

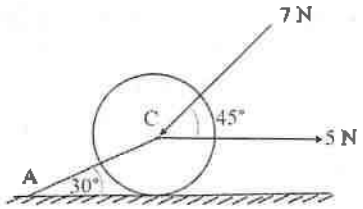


OR

2(B)		A sphere weighting 120 N is tied to a small wall by a string shown in figure. Find the tension T in the string and reaction R of the wall.	12	1	5

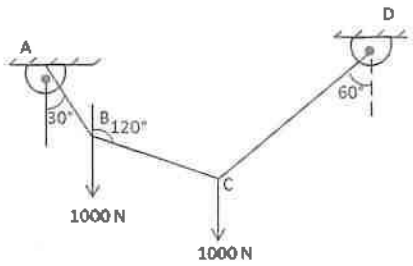


3(A)		A roller weighting 10 KN rests on a smooth horizontal floor. It is connected to the floor using bar AC. Determine the force in the bar AC and reaction from the floor, if roller is subjected to a horizontal force of 5KN and an inclined force of 7KN as shown in figure.	12	2	5

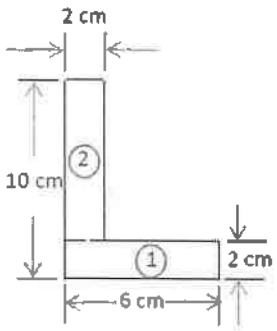


OR

3(B)	A string ABCD, attached to two fixed points A and D has two equal weights 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°.	12	2	5

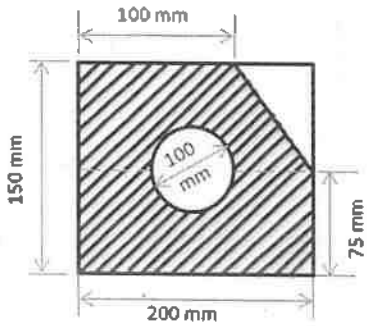


4(A)	Determine the moment of inertia of the L section shown in Figure with respect to its centroidal axes.	12	3	5

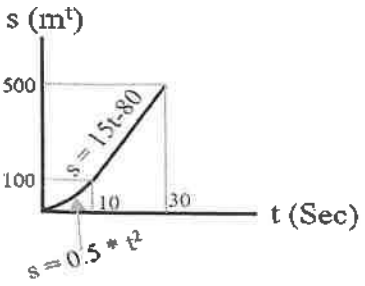


OR

4(B)	Locate the Centroid of the shaded area of the lamina as shown in figure.	12	3	5

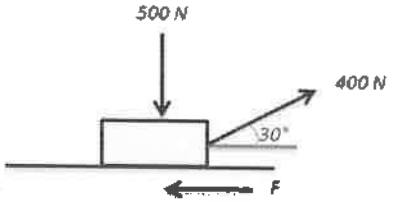


5(A)	A bicycle moves along a straight road such that its position i described by the graph shown in figure. Construct the u-t and graph for $0 \le t \le 30\,\text{sec}$.	12	4	5



OR

5(B)	In a police investigation of tyre marks, it was concluded that a car while in motion along a straight level road skidded for a total of 60 meter after the breaks were applied. If the coefficient of friction between the tyre and the pavement is estimated as 0.5, what was the probable speed of the car just before the breaks were applied?	12	4	4
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 , $a = 10\ m/sec^2$.	12	5	5



OR

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.	12	5	4

*****END*****

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 23ECE101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS INSTITUTION)

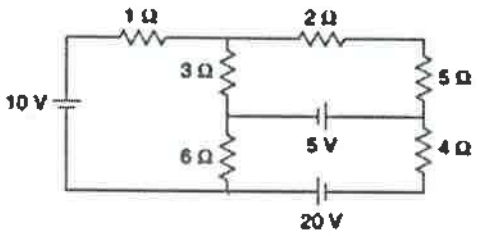
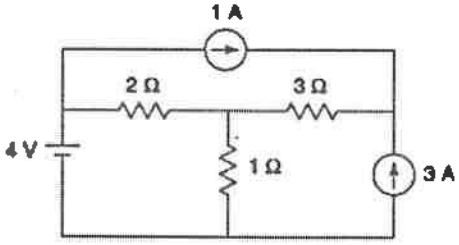
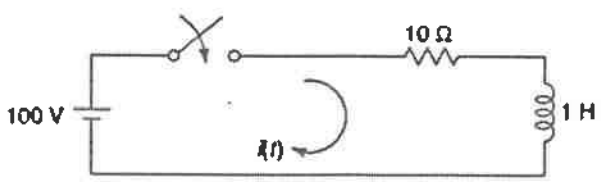
B.Tech I Year II Semester (R23) Supplementary End Semester Examinations, May- 2026

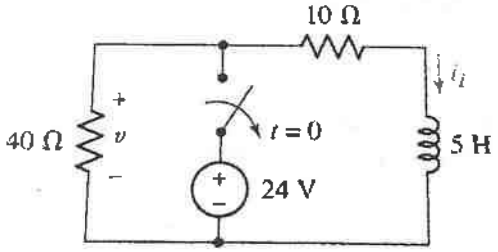
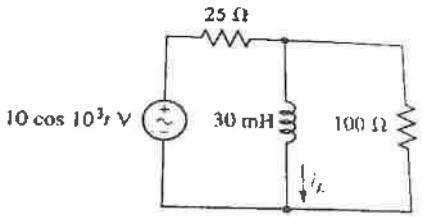
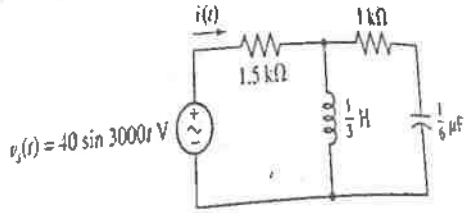
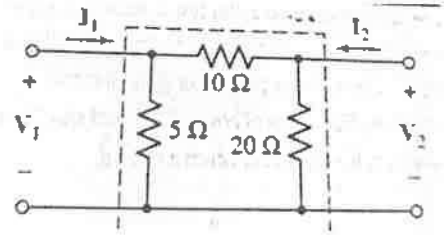
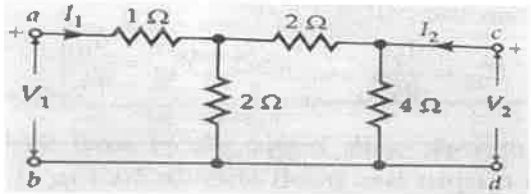
NETWORK ANALYSIS

(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

S.No.		Question	Marks	CO	BL
1.	i)	Draw the Thevinens equivalent circuit.	1	1	1
	ii)	According to the maximum power transfer theorem what is the maximum power in the load.	1	1	1
	iii)	For R=20 kΩ and L=5mH, Calculate the time constant of RL Network.	1	2	2
	iv)	Write the difference between transient state and steady state.	1	2	1
	v)	What is the magnitude and phase angle of the complex impedance $2 + 2j$.	1	3	2
	vi)	Transform the time domain voltage $V(t) = 100\cos(400t - 30^0)$ Volts into phasor domain.	1	3	2
	vii)	Write the condition for parallel resonance.	1	4	1
	viii)	Differentiate mutual inductance with respect to normal inductance.	1	4	1
	ix)	When the two-port network is said to be linear and reciprocal.	1	5	1
	x)	Mention the equation and transmission parameters of the 2-port network.	1	5	1
2(A)	(i)	Determine current through 5-ohm resister using mesh analysis. 	8	1	3
	(ii)	Explain the Telegans theorem with an example	4	1	1
		OR			
2(B)		Find the current through the 1 ohm resister using either Thevenin or Nortons theorem. 	12	1	3
3(A)	(i)	In the given network switch is closed at t=0. Find i(t), voltage across inductor. 	8	2	3

	(ii)	Explain the time constant of the RL and RC circuit with an example.	4	2	
		OR			
3(B)		Find the voltage (V) at t=200 ms. 	12	2	3
	(i)	Apply the voltage $8\angle -50^0 V$ at a frequency $\omega = 100\, rad/sec$ to a 4H inductor, and determine the phasor current and the time domain current.	6	3	4
4(A)	(ii)	Find the current I_L in the given circuit. 	6	3	4
		OR			
4(B)	(i)	Find the current $i(t)$ shown in the figure below. 	12	3	4
	(i)	Derive the expression for quality factor and bandwidth of the series RLC circuit.	6	4	2
5(A)	(ii)	A series RLC circuit has a quality factor of 5 at 50 rad/sec. The current flowing through the circuit at resonance is 10 A and the supply voltage is 100 V. Find the circuit constants.	6	4	2
		OR			
5(B)		Explain the Mutual Inductance and drive the expression for series aiding and parallel opposing for a series connected inductance circuit.	12	4	1
	(i)	Explain Impedance and admittance in two port networks.	6	5	2
6(A)	(ii)	Determine the admittance parameters of the given resistive network. 	6	5	3
		OR			
6(B)		Find the Y- parameters for the network shown in below figure. 	12	5	3

END

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 23EEE102

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech I Year II Semester (R23) Supplementary End Semester Examinations, May-2026

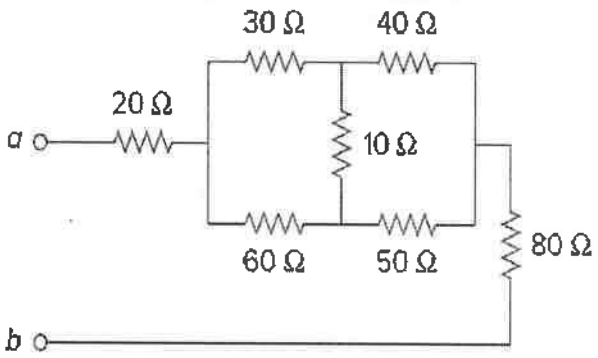
ELECTRICAL CIRCUIT ANALYSIS I

(Electrical & Electronics Engineering)

Time: 3Hrs **Max Marks: 70**

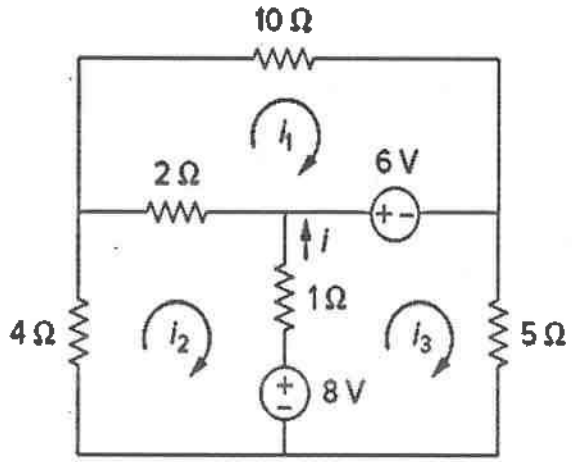
Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

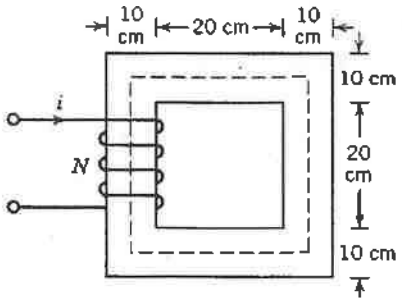
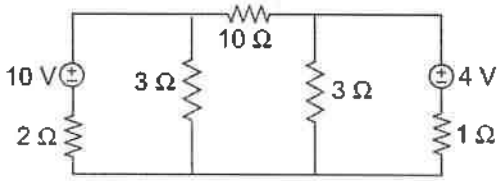
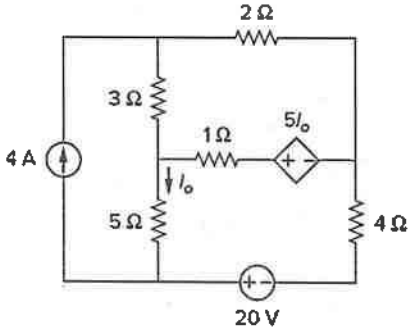
Q.No		Questions	Marks	CO	BL
Q.1	i.	What is Supermesh?	1M	1	1
	ii.	What is source transformation technique?	1M	1	1
	iii.	Define reluctance.	1M	2	1
	iv.	State Faraday's law of electromagnetic induction.	1M	2	1
	v.	Define average value.	1M	3	1
	vi	If the load impedance is 20 + j20, what is the power factor of the circuit?	1M	3	1
	vii.	Define resonance.	1M	4	1
	viii.	Define half power frequencies.	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)		Explain Kirchhoff's laws with appropriate example.	4M	1	3
Q.2(A) (ii)		(ii) Obtain the equivalent resistance R_{ab} of the circuit shown.	8M	1	3



OR

Q.2(B)	Using mesh analysis determine the mesh currents and power absorbed by 1 Ω resistor in the network shown.		12M	1	3



Q.3(A)	The magnetic circuit shown in Fig. has the core of relative permeability μr = 2000. The depth of the core is 5 cm. The coil has 400 turns and carries a current of 1.5 A. Calculate (a) the mean core length lc and the core cross-sectional area Ac (b) The Reluctance of the core (c) the flux and flux density in the core and (d) the inductance of the coil. 	12M	2	3
	OR			
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)	Determine the Average value, RMS value, Form factor and Peak factor of a sinusoidal signal.	12M	3	3
	OR			
Q.4(B)	A resistance of 16 Ω is connected in series with an inductance of 20 mH and this combination is connected across an AC supply of 230 V, 50 Hz. Determine Impedance of the circuit, Input current, Power factor of the circuit, Real power, Reactive power, Apparent power and Draw the phasor diagram.	12M	3	3
Q.5(A)	Derive the expression for resonant frequency and bandwidth for a series RLC resonant circuit.	12M	4	3
	OR			
Q.5(B)	State the dot convention rule for magnetically coupled circuits. Determine the expression for equivalent inductance of two magnetically coupled coils connected in (a) series aiding (b) parallel aiding.	12M	4	3
Q.6(A)	(i) State Thevenin's theorem and explain the procedure to obtain the Thevenin equivalent circuit.	4M	5	3
	(ii) For the circuit shown in Fig., using Norton's theorem, determine the current in the 10-ohm resistor. 	8M	5	3
	OR			
Q.6(B)	Using Superposition theorem, find i_o in the circuit shown. 	12M	5	3

***** END*****

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 23CSE102

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

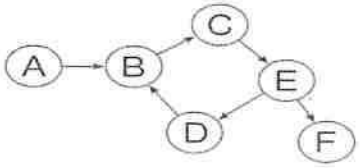
B.Tech I Year II Semester (R23) Supplementary End Semester Examinations, May- 2026

DATA STRUCTURES

(Common to CSE, CST, CSE-AI, CSE-DS, CSE-CS, CSE-AI&ML, and CSE-CN)

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.	Distinguish between linear and nonlinear data structures.	1M	1	2
	ii.	Define Space Complexity.	1M	1	1
	iii.	Define a node in the context of linked lists.	1M	2	1
	iv.	List the advantages of Circular linked list over singly linked list.	1M	2	1
	v.	List the properties and operations queues.	1M	3	1
	vi	State the reason for overflow condition in a stack.	1M	3	1
	vii.	Define full binary tree.	1M	4	1
	viii	Define height of the tree.	1M	4	1
	ix.	Define graph.	1M	5	1
	x.	What is a hash table?	1M	5	1
Q.2(A)		Explain binary search and linear search with an example: Search for 22 in the sorted list [10, 15, 20, 22, 30, 35].	12M	1	2
		OR			
Q.2(B)		Demonstrate an algorithm to implement Bubble sort with suitable example.	12M	1	2
Q.3(A)		Explain the algorithm for creating and traversing operations in single linked list with example.	12M	2	2
		OR			
Q.3(B)		Demonstrate the algorithms for implementing Stack using Linked List with an example.	12M	2	2
Q.4(A)		Calculate the postfix expression: 6 2 3 + - 3 8 2 / + * using a stack. Show stack content after each step.	12M	3	3
		OR			
Q.4(B)		Discuss the algorithm for implementing Queue using arrays with an example.	12M	3	2
Q.5(A)		Construct a Binary Search Tree by inserting the values: 50, 30, 70, 20, 60, 80. and Delete node 30 from the BST created above. Show the updated structure.	12M	4	3
		OR			
Q.5(B)		Construct a max-heap and min-heap for the elements: 10, 40, 20, 30, 50, 85, 92, 55, 42.	12M	4	3
Q.6(A)		Consider the given graph and show its adjacency matrix & adjacency list representations. 	12M	5	2
		OR			
Q.6(B)		Explain different types of hashing techniques in detail with suitable examples.	12M	5	2

***** END*****

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 23ME102

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS INSTITUTION)

B. Tech I Year II Semester (R23) Supplementary End Semester Examinations, May – 2026

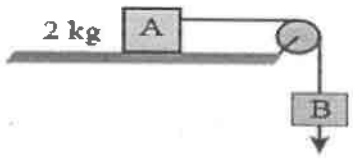
ENGINEERING MECHANICS

(Mechanical Engineering)

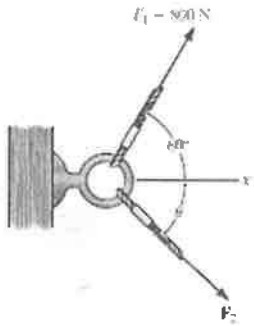
Time: 3Hrs **Max Marks: 70**

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

S.No.		Question	Marks	CO	BL
1.	i)	What is the difference between rigid body and resistant body?	1	1	1
	ii)	Force of friction is dependent on area of contact between two surfaces? The statement is true or false?	1	1	1
	iii)	What are the total number of reaction forces at hinge support?	1	2	1
	iv)	A wheel nut is tightened to a moment of 100 Nm. A motorist has to undo the nut with a wheel wrench which is 0.40 m long. What force must he apply?	1	2	1
	v)	Define Pappus's theorem for volume.	1	3	1
	vi)	What is the physical significance of centre of gravity?	1	3	1
	vii)	What is meant by D. Alembert's principle?	1	4	1
	viii)	What is momentum in engineering mechanics?	1	4	1
	ix)	What is the kinetic energy of a rolling object?	1	5	1
	x)	What is the difference between translational and rotational motion?	1	5	1
2(A)	(i)	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. ($g=10\ m/s^2$)	6	1	3

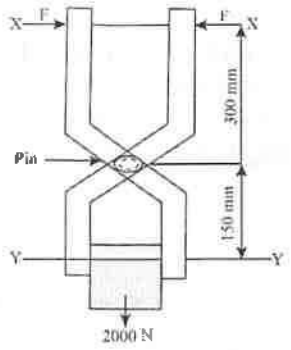


	(ii)	It is required that the resultant force acting on the eyebolt, as shown in Fig. be directed along the positive x axis and that F2 have a minimum magnitude. Determine this (F2) magnitude, the angle θ, and the corresponding resultant force.	6	1	3



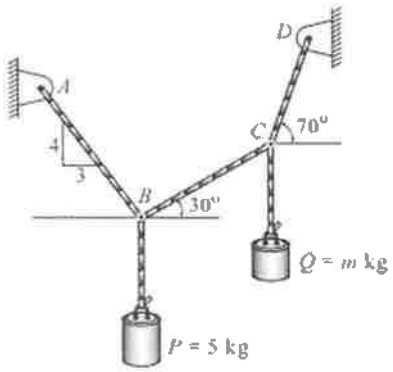
OR

2(B)	(i)	The figure shows a pair of pin-jointed gripper - tongs holding an object weighing 2000 N. The coefficient of friction (μ) at the gripping surface is 0.1. XX is the line of action of the input force and YY is the line of application of gripping force. If the pin-joint is assumed to be frictionless, calculate the magnitude of force F required to hold the weight.	6	1	3

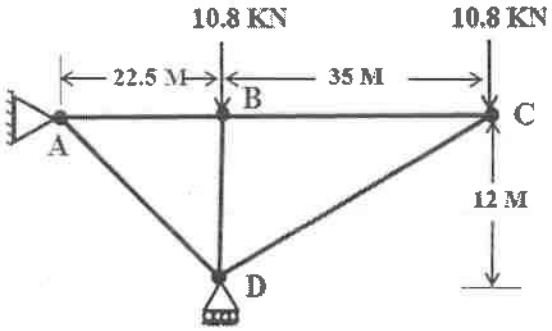


(ii) A man holds a book weighing 10 N between hands and keeps it free from falling by pressing both hands against the book with a force of 25 N each. Calculate the coefficient of friction between the book and hand. | 6 | 1 | 3

3(A) (i) A block P of mass 5 kg and block Q of mass 'm' kg is suspended through the chord is in the equilibrium position as shown in the figure. Determine the mass of the block Q. | 6 | 2 | 3

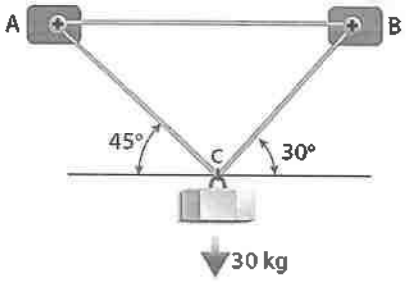


(ii) Determine the magnitude and nature of forces in all the member of the truss structure. | 6 | 2 | 3

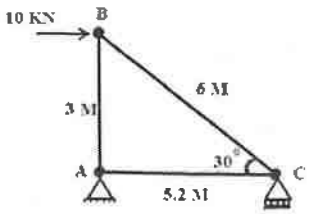


OR

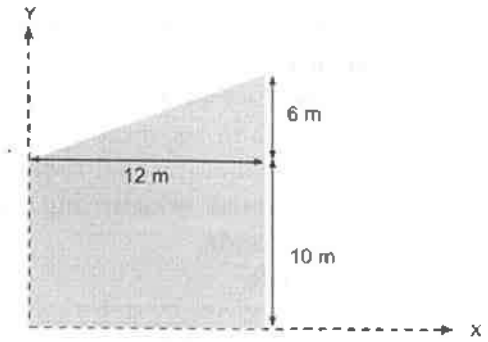
3(B) (i) An iron block of mass 30 kg is hanging from the two supports, A and B, as shown in the diagram. Determine the tensions in the rope AC and rope BC. | 6 | 2 | 3



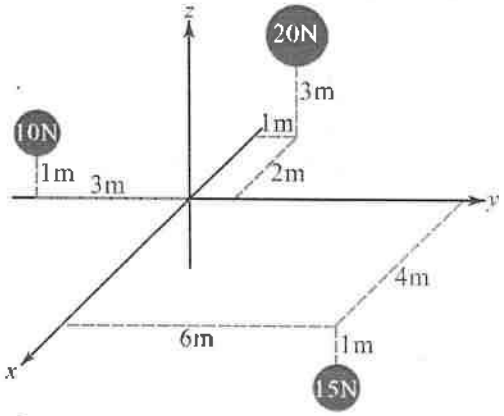
(ii) The truss is supported by roller at C and hinge at A. Find the magnitude and nature of forces in all the member of the truss. | 6 | 2 | 3



4(A)	(i)	Calculate the area moment of inertia about the x-axis of the composite shape shown below.	6	3	3

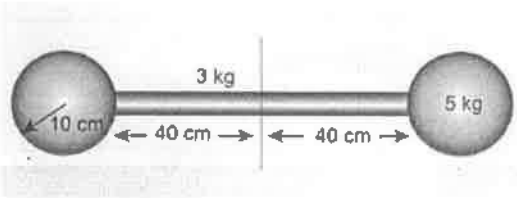


	(ii)	Determine the center of gravity of the set of particles shown.	6	3	3



OR

4(B)	(i)	Find the mass moment of inertia about the geometric center of the given structure made up of one thin rod connecting two similar solid spheres as shown in Figure.	6	3	3



	(ii)	Derive an expression for the mass moment of inertia of cylinder about the z-axis. The density of material is constant.	6	3	3
5(A)	(i)	A single force acts on a 3.0 kg particle-like object whose position is given by $x= 3t-4t^2 + t^3$, with x in meter and t in second. Find the work done by the force t=0 sec to t=4 sec.	6	4	3
	(ii)	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.	6	4	3

OR

5(B)	(i)	A 80 N body moving to the right at a speed of 3 m/sec strikes a 10 N body that is moving that is moving to the left at a speed of 10m/sec. The final velocity of 10 N body is 4m/sec to the right. Calculate the coefficient of restitution and the final velocity of the 80 N body.	6	4	3

	(ii)	A 60 Kg woman holds a 9 kg packet as she stands within an elevator which accelerate upward at a rate of g/4. Determine the force R which the elevator floor exert on her feet during the acceleration interval. Assume g=10 m/s²	6	4	3
6(A)	(i)	A child stands at the centre of a turntable with his arms outstretched. The turntable is set rotating with an angular speed of 40 rev/min. How much is the angular speed of the child if he folds his hands back and thereby reduces his moment of inertia to 2/5 times the initial value? Also, show that the child's new kinetic energy of rotation is more than the initial kinetic energy of rotation.	6	5	3
	(ii)	The rotation of fly wheel is governed by the equation $\omega = 3t^2 - 2t + 2$ where ω is the radians per second and t is in seconds. After one second from the start the angular displacement was 4 radians. Determine the angular displacement, angular velocity and angular acceleration of the flywheel when t=3 seconds.	6	5	3
		OR			
6(B)	(i)	The angular acceleration of a fly wheel is given by α=8-t, where α is in radians/s² and t is in seconds. If the angular velocity of the flywheel is 42 rad/s at the end of 6 seconds, determine the initial angular velocity.	6	5	3
	(ii)	A wheel of mass 5 kg and radius 0.40 m is rolling on a road without sliding with angular velocity 10 rads−1. The moment of inertia of the wheel about the axis of rotation is 0.65 kg m². Calculate the percentage of kinetic energy of rotation in the total kinetic energy of the wheel.	6	5	3

*****END*****

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 23PHY101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS INSTITUTION)

B. Tech I Year II Semester (R23) Supplementary End Semester Examinations, May - 2026

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		Questions	Marks	CO	BL
Q.1	i.	State the resolving power of a grating.	1M	1	1
	ii.	What is double refraction?	1M	1	1
	iii.	Define packing fraction of a crystal.	1M	2	1
	iv	What are miller indices?	1M	2	1
	v.	Estimate the de-Broglie wavelength of the electron raised to a potential of 1000 V?	1M	3	3
	vi	Write two merits of quantum free electron theory.	1M	3	1
	vii.	Mention any two differences between intrinsic and extrinsic semiconductors.	1M	4	1
	viii.	Define the drift current and diffusion current.	1M	4	1
	ix.	Give the relation between electrical polarization($\overrightarrow{P}$) and electric field($\overrightarrow{E}$).	1M	5	1
	x.	Write down any two properties of ferromagnetic materials.	1M	5	1
Q.2(A)		Derive an expression for determining the wavelength of a monochromatic light using Newton's ring experiment with suitable schematics.	12M	1	3
		OR			
Q.2(B)		Discuss the Fraunhofer diffraction due to double slit. Explain how interference and diffraction phenomena were involved in contributing the net intensity.	12M	1	3
Q.3(A)		Explain the seven crystal systems and fourteen Bravais lattices with neat diagrams by indicating the lattice parameters.	12M	2	2
		OR			
Q.3(B)		Describe and derive the Bragg's law of x-ray diffraction. Explain the crystal structure determination by powder method.	12M	2	2
Q.4(A)		Apply Schrodinger's equation for a quantum mechanical particle confined in a potential box defined as $V(x) = 0$ for $0 \le x \le a$ and $V(x) = \infty$ and obtain the energy eigen values and eigen functions for this particle in the ground, 1st and 2nd excited states.	12M	3	3
		OR			
Q.4(B)		Derive an expression for the density of energy states (DoS) function per unit volume of the crystal.	12M	3	3
Q.5(A)		Derive the electron and hole concentrations for an intrinsic semiconductor. Show that the intrinsic carrier concentration is independent of temperature.	12M	4	4
		OR			
Q.5(B)		Using outline of Hall measurement set up, establish the relation between Hall voltage and Hall coefficient. Mention its applications in semiconductors	12M	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.	10M	5	4
	ii) Calculate the electronic polarizability of the argon atom. Given ε_r=1.0024 at NTP and N = 2.7×10^{25} atoms/m^3.	2M	5	4
	OR			
Q.6(B)	Define magnetic hysteresis and magnetic domains. Explain the hysteresis curve based on the domain theory of ferromagnetism. Mentions the applications of ferromagnetic materials.	12M	5	4

***** END*****

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 23CME101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS INSTITUTION)

B.Tech I Year I & II Semesters (R23) Supplementary End Semester Examinations, May- 2026

BASIC CIVIL AND 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

S.No.		Question	Marks	CO	BL
1.	i)	What are the different types of bricks?	1	1	1
	ii)	Write any two Non-Destructive Test (NDT) for Concrete.	1	1	1
	iii)	Define surveying?	1	2	1
	iv)	Difference between plane and geodetic surveying.	1	2	1
	v)	List out the components of a dam.	1	3	1
2(A)		How cement is formed? Write the chemical composition of cement. Also write the good qualities and uses of cement.	10	1	2
		OR			
2(B)		Define aggregate. Write the types of aggregate. Explain different tests on aggregates.	10	1	2
3(A)		Define whole circle bearing and reduced bearings. Also to convert the following reduced bearings of survey lines to whole circle bearings. (i) N 36°30' E (ii) S 25°10' E (iii) S 32° 28' W (iv) N 46°15' W	10	2	4
		OR			
3(B)		The following readings were taken with 4m staff by Auto level. Given by BM = 150.000m. The instrument is shifted after 5th and 9th readings. 1.535, 2.015, 2.305, 1.635, 1.310, 2.210, 2.415, 1.015, 2.645, 1.125, 2.125, 1.905. prepare a page of level book and calculate RL of all the points. Use Rise and Fall Method.	10	2	4
4(A)		Classify the different types of pavements and explain in detail?	10	3	2
		OR			
4(B)		Define the term "Hydrology". Describe the concept of hydrological cycle with neat sketches.	10	3	2

END

PART-B: BASIC MECHANICAL ENGINEERING **Max Marks: 35**

Q.No		Question	Marks	CO	BL
Q.1	i.	Write down the difference between alloy and composite.	1M	1	1
	ii.	Define smart materials.	1M	1	1
	iii.	List out the advantages of casting process.	1M	2	1
	iv.	What are the advantages of 3D printer.	1M	2	1
	v.	What are the laws of robotics?	1M	3	1
Q.2(A)		Describe the role of mechanical engineer in Aerospace, and Marine Sector.	10M	1	2
		OR			
Q.2(B)		Explain what a composite material is and describe its key characteristics. Discuss the classification of composite materials, along with their advantages, disadvantages, and typical applications.	10M	1	2
Q.3(A)		What is CNC machining and how does it work? What are the advantages and disadvantages of CNC machining?	10M	2	2
		OR			
Q.3(B)		Illustrate the working principle of a 4-stroke Compression Ignition (CI) engine with the help of a neat sketch and explain the function of each stroke.	10M	2	3
Q.4(A)		Explain the working process of hydro-electric power plant with neat sketch.	10M	3	2
		OR			
Q.4(B)		Explain various types of joints and links in robots.	10M	3	2

***** END*****

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 23EEE101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS INSTITUTION)

B. Tech I Year II Semester (R23) Supplementary End Semester Examinations, May - 2026

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to All)

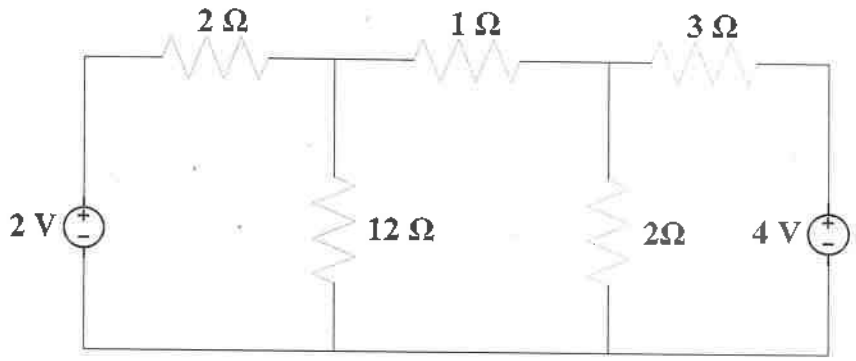
Time: 3Hrs **Max Marks: 70**

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 6 answer either A or B only

PART-A: BASIC ELECTRICAL ENGINEERING

Max Marks: 35

Q.No		Question	Marks	CO	BL
Q.1	i.	State Kirchhoff's Voltage law.	1M	1	1
	ii.	Define Form Factor.	1M	1	1
	iii.	Write some applications of Electrical machines.	1M	2	1
	iv.	Classify various conventional & non-conventional power plants.	1M	2	1
	v.	Correlate the safety precautions to avoid shock?	1M	3	1
Q.2(A)		Find the current in the 12Ω resistor by using superposition theorem.	10M	1	2



OR

Q.2(B)	A Capacitor C is connected in series with a 40Ω resistor across a supply of frequency 50 Hz. A current of 3A flows and the circuit impedance is 50Ω. Calculate (a) The value of capacitance (b) the supply voltage (c) the phase angle between the supply voltage and current (d) the potential drop across the resistor (e) the potential difference across the capacitor (f) Draw the phasor diagram.	10M	1	2
Q.3(A)	Illustrate various components of a DC machine with neat sketch.	10M	2	2

OR

Q.3(B)	Explain the construction and working of Permanent Magnet Moving Coil with diagram.	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*****

PART-B: BASIC ELECTRONICS ENGINEERING

Max Marks: 35

Q.No		Question	Marks	CO	BL
Q.1	i.	What is mean by semiconductor?	1M	1	1
	ii.	Define Amplifier.	1M	1	1
	iii.	Draw the symbol diagram for BJT.	1M	2	2
	iv.	Convert $(ABC)_{16}$ to Binary.	1M	2	2
	v.	Write the truth table for NAND Gate.	1M	3	2
Q.2(A)	Explain in detail the operation of a PN junction diode in forward and reverse bias conditions and draw the relevant V-I characteristics.		10M	1	2
	OR				
Q.2(B)	With neat sketch, explain the input and output characteristics of Common Collector configuration.		10M	1	2
Q.3(A)	Discuss in detail the operation of a Bridge rectifier with a neat circuit diagram and relevant waveforms.		10M	2	2
	OR				
Q.3(B)	Draw the block diagram of an electronic instrumentation system and explain each block.		10M	2	2
Q.4(A)	Verify all the types of logic gates with symbol diagram and truth table briefly.		10M	3	2
	OR				
Q.4(B)	Draw the circuit diagram of a D type flip-flop and explain its operation with the help of a truth table.		10M	3	2

***** END*****

SET-1

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 23ME101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS INSTITUTION)

B.Tech I Year I & II Semesters (R23) Supplementary End Semester Examinations, May– 2026

ENGINEERING GRAPHICS

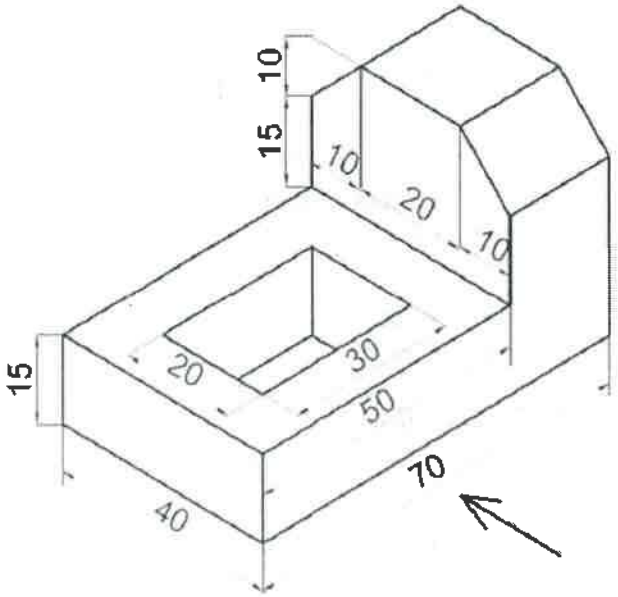
(Common to All)

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

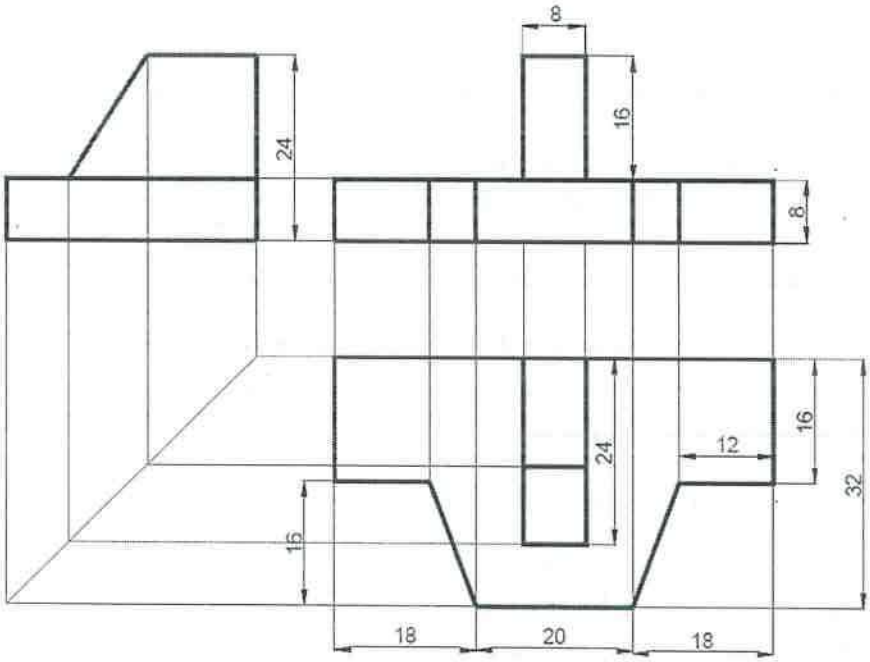
S.No.	Question	Marks	CO	BL
Q.1(A)	Draw the Involute of a circle of radius 25 mm. Also draw the tangent and normal 90 mm from the Centre of the circle.	14M	1	3
	OR			
Q.1(B)	Construct a parabola when the distance between the focus and directrix is 30mm. Also draw the tangent and normal 20 mm from the 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.	7M	2	3
	(ii) Draw the projections of the following points on the same ground line and keep the distance between the projectors as 50mm. Name the quadrants in which they are? a) Point P – 50mm in front of the VP & 30mm above the HP b) Point Q – 65mm below the HP and on the VP c) Point R – 35mm below the HP and 50mm behind the VP d) Point S – 40mm above the HP and 45mm in front of the VP	7M	2	3
	OR			
Q.2(B)	A rectangle with 30mm and 50mm sides is resting on HP on one small side which is 30° inclined to VP, while the surface of the plane makes 45° inclinations with HP. Draw its Projections.	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 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 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 45° 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
	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 is shown below. 14M 5 3



Top View:

*** END***

SET-2

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 23ME101

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

B.Tech I Year I & II Semester (R23) Supplementary End Semester Examinations, May– 2026

ENGINEERING GRAPHICS

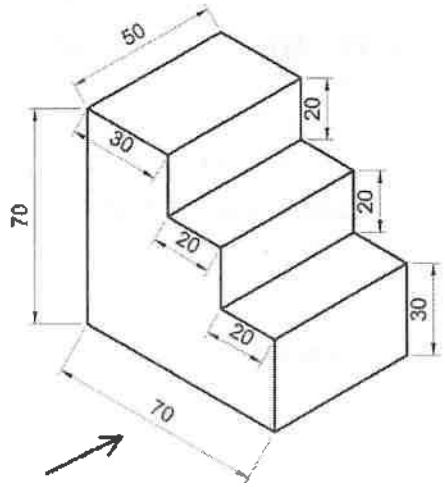
(Common to All)

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

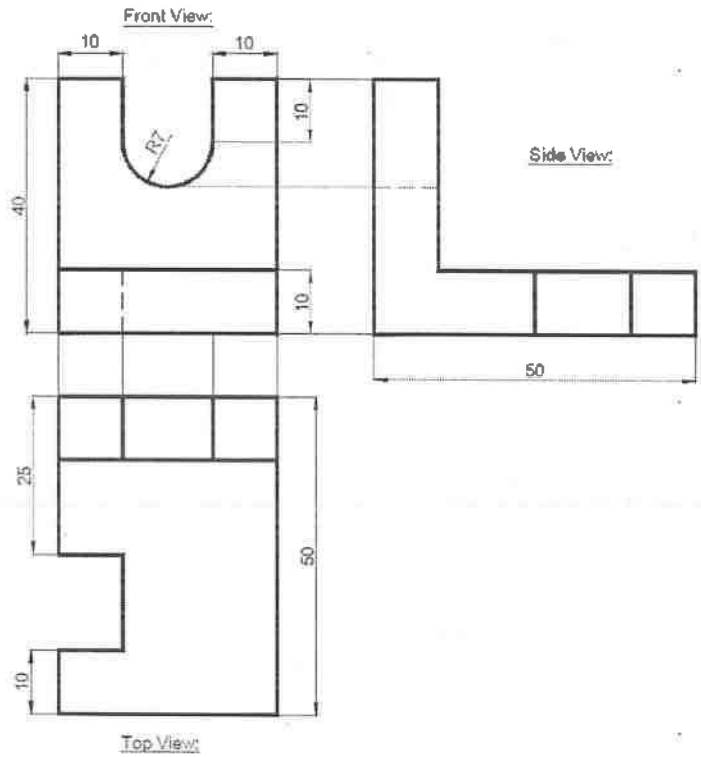
S.No.	Question	Marks	CO	BL
Q.1(A)	Construct an ellipse when the distance between the focus and directrix is 35 mm and eccentricity is 3/4. Also draw the tangent and normal to any point on the curve.	14M	1	3
	OR			
Q.1(B)	Construct a cycloid for one and half revolutions when the radius of the generating 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
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.	7M	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	7M	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)	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 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 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

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 is shown below. 14M 5 3



***** END*****