

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

B.Tech I Year II Semester (R20) Regular & Supplementary End Semester Examinations, July - 2023

C PROGRAMMING AND DATA STRUCTURES

(Common to All)

Time: 3Hrs

Max Marks: 60

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 break and continue statement in C programming language.	1M	1	2
	ii. What is a variable?	1M	1	1
	iii. What is an array? Write the syntax to declare one dimensional array using example.	1M	2	1
	iv. Define Insertion Sort.	1M	2	1
	v. Define Pointers and write the syntax to initialize it	1M	3	1
	vi. Define string with an example.	1M	3	1
	vii. What is structure? State its syntax.	1M	4	1
	viii. Name various File opening modes.	1M	4	1
	ix. Define Data Structure.	1M	5	1
	x. How would you compare stack and queue?	1M	5	1
Q.2(A)	Explain the structure of C program and write the various steps involved in executing a C program.	10M	1	4
	OR			
Q.2(B)	Describe the various conditional statements in C with an example.	10M	1	3
Q.3(A)	What are four types of user defined function prototypes in C? Explain each type with suitable example program.	10M	2	2
	OR			
Q.3(B)	Illustrate and develop the code for Linear Search with an example	10M	2	4
Q.4(A)	Explain different string manipulation functions with suitable examples	10M	3	3
	OR			
Q.4(B)	Elaborate on the different types of dynamic memory allocation functions with example.	10M	3	2
Q.5(A)	Explain the difference between structure and union.	10M	4	4
	OR			
Q.5(B)	Discuss about the fopen(), fclose(), fprintf(), fscanf(), fgetc() and fputc() functions with example.	10M	4	3
Q.6(A)	List out operations on stack? Develop C program with functions to implement them.	10M	5	4
	OR			
Q.6(B)	Explain the concept of insertion, deletion and display operations in a single linked list with a neat diagram.	10M	5	3

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech I Year II Semester (R20) Regular & Supplementary End Semester Examinations, July- 2023

APPLIED PHYSICS

(Common to EEE, ECE, CST, CSE, CSE-AI, CSE-DS, CSE-CS, CSE-IOT)

Time: 3Hrs

Max Marks: 60

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 are the characteristics of simple harmonic motion?	1M	1	1
	ii. What is the maximum potential energy at mean position for a simple harmonic oscillator?	1M	1	2
	iii. Why do we get circular fringes in Newton's Ring experiment?	1M	2	2
	iv. Write the relation between phase difference and path difference.	1M	2	1
	v. Give an example for the particle nature of light.	1M	3	1
	vi. Write relation between group velocity and Phase velocity.	1M	3	2
	vii. Mention an example for a direct band gap semiconductor.	1M	4	2
	viii. Define a free particle.	1M	4	1
	ix. Define total internal reflection.	1M	5	1
	x. Why two-level laser is difficult to achieve?	1M	5	2
Q.2(A)	A particle undergoes Simple Harmonic Motion dictated by the equation $x = 2 \sin(2\pi t + \pi/2)$ cm. a) Find Amplitude, frequency, time period and initial phase of motion. b) Find the magnitude of velocity, acceleration and Kinetic energy at mean and extreme position.	5M 5M	1	2
OR				
Q.2(B)	Discuss the various cases of damped harmonic oscillator by deriving the necessary expressions?	10M	1	2
Q.3(A)	Explain how the radius of curvature of plano convex lens is determined by forming Newton's rings.	10M	2	3
OR				
Q.3(B)	Describe Fraunhofer diffraction due to single slit with a suitable diagram. And obtain the conditions for maxima, minima, and secondary maxima intensities in the diffracted spectrum.	10M	2	2
Q.4(A)	i) What are the postulates of quantum mechanics? ii) Derive time dependent Schrodinger wave equation?	5M 5M	3	3
OR				
Q.4(B)	Obtain the allowed wave functions and Eigen energies for a particle bounded in an one dimensional infinite height potential well.	10M	3	3
Q.5(A)	Discuss Quantum free electron theory of metals in detail.	10M	4	2

OR

Q.5(B) Explain formation of the energy bands in intrinsic and extrinsic semiconductors with neat diagrams. 10M 4 3

Q.6(A) Discuss the working principle and construction of He-Ne Laser. 10M 5 3

OR

Q.6(B) Explain the following: 5 2

- i) Total Internal Reflection 2M
- ii) Numerical Aperture 2M
- iii) Acceptance angle 2M
- iv) Critical angle 2M
- v) Acceptance cone angle 2M

*** END***

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B.Tech I Year II Semester (R20) Regular & Supplementary End Semester Examinations, July - 2023

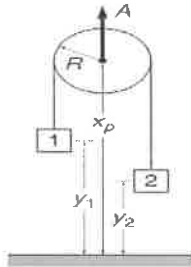
ENGINEERING PHYSICS

(Civil Engineering and Mechanical Engineering)

Time: 3Hrs

Max Marks: 60

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 Newton's third law	1M	1	1
	ii. Write the expression for velocity in polar coordinates.	1M	1	1
	iii. Define work-energy theorem?	1M	2	1
	iv. Explain the stability of the system in terms of potential energy.	1M	2	2
	v. Define simple harmonic motion.	1M	3	1
	vi. Define standing wave ratio.	1M	3	1
	vii. Mention any two important conditions to get interference pattern.	1M	4	1
	viii. What is grating element?	1M	4	1
	ix. What are the characteristics of laser light?	1M	5	2
	x. What is total internal reflection?	1M	5	1
Q.2(A)	Derive the equation of motion of an electron of charge $-e$ in the ionosphere and mass m which is initially at rest, and which is suddenly subjected to an electric field $E = E_0 \sin \omega t$ (ω is the frequency of oscillation in radians per second).	10M	1	3
OR				
Q.2(B)	Two masses, M_1 and M_2 , are connected by a string that passes over a massless pulley, accelerating upward at rate A , the gravitational field as shown. Find the rate at which the masses accelerate and the tension T in the string.	10M	1	4
				
Q.3(A)	Derive the rocket equation and show that final velocity is independent of how the mass is released when it moves in a free space?	10M	2	4
OR				
Q.3(B)	Deduce the expression for escape velocity for an object of mass m projected upward from the earth at some angle, using work-energy theorem.	10M	2	3
Q.4(A)	What are transverse waves? Explain the solution of wave equation and velocity of a transverse wave along a stretched string?	10M	3	3
OR				
Q.4(B)	i) What are Lissajous plots? What are the factors they depend on?	4M	3	3
	ii) Construct the Lissajous figures for the superimposed two perpendicular simple harmonic motions described by following equations? $x = 20 \cos(2\omega t)$ and $y = 20 \cos(4\omega t + \pi/2)$	6M		

Q.5(A)	Describe the arrangement to observe Newton's rings by reflected light. Obtain an expression for the radius of curvature of a Plano-convex lens?	10M	4	3
OR				
Q.5(B)	What is meant by Diffraction? and Explain fraunhofer diffraction due to single slit?	10M	4	3
<hr/>				
Q.6(A)	Explain the construction and working of Ruby laser with the help of a neat energy level diagram.	10M	5	4
OR				
Q.6(B)	<i>i)</i> Define Acceptance angle and numerical aperture. Derive an expression for the acceptance angle of optical fibers	6M	5	4
	<i>ii)</i> A glass fiber has a core material of refractive index 1.45 and cladding material of refractive index 1.40. If it is surrounded by air, calculate the critical angle at the core-cladding boundary and cladding-air boundary.	4M		5
*** END***				

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech I Year II Semester (R20) Regular & Supplementary End Semester Examinations, July- 2023**ENGINEERING CHEMISTRY**

(Common to All)

Time: 3Hrs

Max Marks: 60

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 endpoint colour change in the estimation of the hardness of water?	1M	1	1
	ii. If $P < \frac{1}{2} M$, which ions are responsible for the alkalinity of water?	1M	1	2
	iii. State Pauli Exclusion Principle.	1M	2	1
	iv. How many peaks are observed in E1 reaction	1M	2	2
	v. How many peaks are expected in NMR spectra of $\text{CH}_3\text{CH}_2\text{OH}$.	1M	3	2
	vi. Define Rayleigh scattering	1M	3	1
	vii. State the second law of thermodynamics.	1M	4	1
	viii. Write the anodic reaction of Daniel's cell.	1M	4	2
	ix. Define viscosity.	1M	5	1
	x. Give any two examples of allotropes of carbon.	1M	5	1
Q.2(A)	Discuss how dissolved oxygen present in the water can be estimated.	10M	1	3
OR				
Q.2(B)	Explain the following boiler troubles and how they can be solved. i) Scale formation ii) Caustic embrittlement	10M	1	4
Q.3(A)	Predict the geometry and bond angle of H_2O , XeF_2 , CH_4 , BF_3 and PCl_5 using VSEPR theory.	10M	2	3
OR				
Q.3(B)	Elaborate on E1 and E2 reaction with suitable examples.	10M	2	2
Q.4(A)	Describe the principle, and application of Raman spectroscopy.	10M	3	2
OR				
Q.4(B)	Explain the principle, and application of UV-visible spectroscopy.	10M	3	2
Q.5(A)	Define entropy. Explain how the entropy of the system can be estimated at constant pressure, temperature, and volume.	10M	4	2
OR				
Q.5(B)	Discuss the construction, working principle and application of the Pb-acid battery.	10M	4	4
Q.6(A)	Explain the procedure to degrade the harmful textile dye by TiO_2 nanoparticles.	10M	5	3
OR				
Q.6(B)	Elucidate the different properties of liquid lubricants in detail.	10M	5	2

*** END***

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B.Tech. I Year II Semester (R20) Regular & Supplementary End Semester Examinations, July - 2023

BASIC ELECTRICAL ENGINEERING

(Common to all)

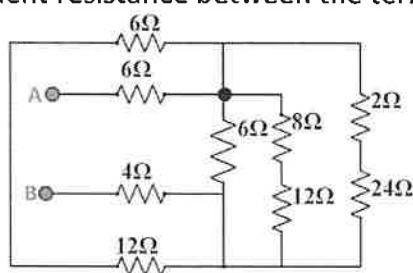
Time: 3Hrs

Max Marks: 60

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

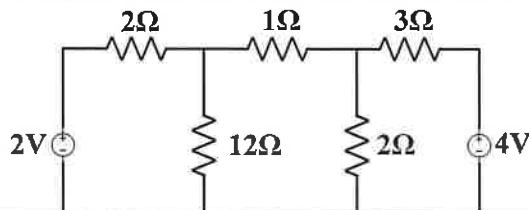
Q. No.	Questions	Marks	CO	BL
Q.1	i. A current of 10A flows through an 12Ω resistor. What is the power delivered in the resistor?	1M	1	1
	ii. In superposition theorem, when we consider the effect of one voltage source, all the other voltage sources are a) Shorted b) Opened c) Removed d) Undisturbed	1M	1	1
	iii. Draw a power triangle of an AC circuit.	1M	2	1
	iv. An alternating current completes 18 cycles in 18 milli seconds. What is the frequency?	1M	2	2
	v. What is a leakage flux?	1M	3	1
	vi. What is an ideal transformer?	1M	3	1
	vii. What is the function of brushes in a DC generator?	1M	4	1
	viii. Determine the synchronous speed of a 4-pole, 400 V, 50 Hz three-phase induction motor.	1M	4	2
	ix. How will an ideal diode behave in an electric circuit, when it is forward biased?	1M	5	1
	x. Mention different types of cables.	1M	5	1

Q.2(A) Determine the equivalent resistance between the terminals A and B. 10M 1 3



OR

Q.2(B) By applying Mesh analysis, determine the current in 1Ω resistor. 10M 1 3



Q.3(A) A coil consists of a resistance of 100 Ω and an inductance of 200mH. If an alternating voltage, v , given by $V=200\sin 500t$ volts is applied across the coil, calculate (a) the circuit impedance, (b) the current flowing, (c) voltage across the resistance, (d) voltage across the inductance and (e) the phase angle between voltage and current. 10M 2 3

OR

Q.3(B) Derive the relationship between phase and line voltages in a balanced three phase star connected system. Also write the expressions for active, reactive and apparent powers. 10M 2 3

Q.4(A) Explain the B-H curve of a Ferro magnetic material with the help of neat diagram. 10M 3 2

OR

Q.4(B) Explain the construction and working principle of a single-phase transformer. 10M 3 3

Q.5(A) i) Derive the *e.m.f.* equation of a DC generator. 6M 4 3

ii) A 4-pole generator has a lap-wound armature with 50 slots with 16 conductors per slot. The useful flux per pole is 30mWb. Determine the speed at which the machine must be driven to generate an *e.m.f.* of 240V. 4M

OR

Q.5(B) Explain the working of DOL starter. Also, write its advantages and disadvantages. 10M 4 2

Q.6(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 5 2

OR

Q.6(B) What is earthing? Explain different types of earthing. Also, write the importance of earthing. 10M 5 2

*** END***

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B.Tech I Year II Semester (R20) Regular & Supplementary End Semester Examinations, July- 2023

LINEAR ALGEBRA AND DIFFERENTIAL EQUATIONS

(Common to Civil Engineering and Mechanical Engineering)

Time: 3Hrs

Max Marks: 60

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 Orthogonal Matrix with an example.	1M	1	1
	ii. Find the Eigenvalues of the matrix $A = \begin{pmatrix} 1 & -1 \\ 0 & 3 \end{pmatrix}$.	1M	1	1
	iii. Find the order and degree of the differential equation $\frac{d^2y}{dx^2} + y^2 = \left(\frac{dy}{dx}\right)^{3/2}$	1M	2	1
	iv. Determine the particular integral of $y' - 4xy = e^x + 2$	1M	2	2
	v. Find the complementary solution of $y''' - 6y'' + 11y' - 6y = \sin x$.	1M	3	2
	vi. What is Wronskian in the differential equation	1M	3	1
	vii. Find the Laplace transform of the $f(t) = \sin te^{-t}$.	1M	4	2
	viii. Find inverse Laplace transform of $L^{-1}\left(\frac{1}{(s-2)(s-1)}\right)$.	1M	4	1
	ix. Write a PDE with order 2 and degree 1.	1M	5	1
	x. Define Laplace equation in two dimensional space.	1M	5	1
Q.2(A)	Show that every square matrix can be expressed as the sum of symmetric and skew-symmetric matrices.	10M	1	3
OR				
Q.2(B)	Show that the matrix $A = \begin{bmatrix} 1 & -2 & 2 \\ 1 & -2 & 3 \\ 0 & -1 & 2 \end{bmatrix}$ satisfies its characteristic equation. Hence find i) A^{-1} ii) A^4 using Cayley-Hamilton theorem.	10M	1	3
Q.3(A)	(i) Solve $(1 + xy)ydx + (1 - xy)x dy = 0$	5M	2	3
	(ii) Solve $(e^y + \cos x \cos y)dx = (\sin x \sin y - xe^y)dy$	5M		3
OR				
Q.3(B)	Solve $e^x \frac{dy}{dx} = 2xy^2 + ye^x$	10M	2	3
Q.4(A)	Solve the differential equation $y'' + y = e^{-x} + x^3 + e^x \sin x$.	10M	3	3
OR				
Q.4(B)	Solve by using method of variation of parameters $(D^2 + 4)y = \tan 2x$.	10M	3	3

Q.5(A) Show that $\int_0^{\infty} e^{-3t} t \sin t dt = \frac{3}{50}$ 10M 4 3

OR

Q.5(B) Find solution of differential equation $y'' + y = t$ with initial condition $y(0) = 1, y'(0) = 2$ by using Laplace transformation. 10M 4 3

Q.6(A) Form the Differential Equation by eliminating arbitrary constants and arbitrary functions from the following 10M 5 3

$$\log(az - 1) = x + ay + b \quad (\text{ii}) \quad z = f(x) + e^y g(x)$$

OR

Q.6(B) Solve the partial differential equation by $\frac{\partial u}{\partial x} = 2 \frac{\partial u}{\partial t} + u$ where $u(x, 0) = 6e^{-3x}$ 10M 5 3

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech I Year II Semester (R20) Regular & Supplementary End Semester Examinations, July- 2023**LINEAR ALGEBRA**

(Common to CSE, CST, CSO, CAI, CSD, CSC)

Time: 3Hrs

Max Marks: 60

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 Part-A or B only

Q.No	Question	Marks	CO	BL
Q.1	i. Find a matrix B such that $A + B^T = A - B^T$ where $A = \begin{bmatrix} 2 & -3 \\ 4 & -1 \end{bmatrix}$	1M	1	1
	ii. State Cayley-Hamilton theorem	1M	1	1
	iii. Define Basis of the vector space	1M	2	1
	iv. Determine whether the given set of vectors $\{[1, 2], [2, 6]\}$ is Linearly Independent (or) not.	1M	2	1
	v. Find T^{-1} , if exists for the Linear transformation $T(x, y) = (3x, x - y)$	1M	3	2
	vi. Find $S \circ T$ whenever it is defined $T(x, y, z) = (x - y + z, x + z)$, $S(x, y) = (x, x - y, y)$.	1M	3	2
	vii. Find the matrix representation of the linear transformation $T(x, y) = (y, 3x - y)$ on R^2 with respect to the standard basis $\{e_1, e_2\}$	1M	4	1
	viii. Let $T: R^2 \rightarrow R^2$ be the Linear transformation defined by $T(x, y) = (2y, -x + 4y)$. Compute $[T^*]_{\alpha}$ for the standard basis $\alpha = \{e_1, e_2\}$.	1M	4	2
	ix. Determine k so that the vectors are orthogonal with respect to Euclidean inner product space of $R^4 \{(2, 3, k, 4), (1, k, 3, -5)\}$	1M	5	1
	x. Check whether the matrix $\begin{bmatrix} \cos \theta & \sin \theta \\ -\sin \theta & \cos \theta \end{bmatrix}$ is orthogonal or not.	1M	5	2
Q.2(A)	Determine the condition on b_i so that the following system has no solution, unique and infinite number of solutions $2x + y + 7z = b_1$; $6x - 2y + 11z = b_2$; $2x - y + 3z = b_3$.	10M	1	3
OR				
Q.2(B)	Find the eigenvalues and eigenvectors of the matrix, $A = \begin{bmatrix} 3 & -2 & 0 \\ -2 & 3 & 0 \\ 0 & 0 & 5 \end{bmatrix}$	10M	1	3

- Q.3(A) i. Does the vector $(3, -1, 0, -1)$ belong to the subspace of \mathbb{R}^4 spanned by the vectors $(2, -1, 3, 2)$, $(-1, 1, 1, -3)$ and $(1, 1, 9, -5)$? 10M 2 3
 ii. Is $\{\cos^2 x, \sin^2 x, 1, e^x\}$ linearly independent in the vector space $C(\mathbb{R})$.

OR

- Q.3(B) Find the nullity and rank of the each of the following matrices 10M 2 3

$$\text{a. } A = \begin{bmatrix} 1 & 3 & 1 & 7 \\ 2 & 3 & -1 & 9 \\ -1 & -2 & 0 & -5 \end{bmatrix} \quad \text{b. } A = \begin{bmatrix} 1 & 2 & 1 & 2 \\ 1 & 1 & 2 & 0 \\ 2 & 1 & 5 & -2 \end{bmatrix}$$

- Q.4(A) Show that the linear transformation T on \mathbb{R}^3 is invertible and find a formula for T^{-1} . 10M 3 3

- i. $T(x, y, z) = (3x, x - y, 2x + y + z)$.
 ii. $T(x, y, z) = (2x, 4x - y, 2x + 3y - z)$.

OR

- Q.4(B) Let $T: P_3(\mathbb{R}) \rightarrow P_3(\mathbb{R})$ be the linear transformation defined by $Tf(x) = f''(x) - 4f'(x) + f(x)$. Find the matrix $[T]_{\alpha}$ for the basis $\alpha = \{x, 1+x, x+x^2, x^3\}$. 10M 3 3

- Q.5(A) Consider the following ordered bases of \mathbb{R}^3 : $\alpha = \{e_1, e_2, e_3\}$ the standard basis and $\beta = \{u_1 = (1, 1, 1), u_2 = (1, 1, 0), u_3 = (1, 0, 0)\}$. 10M 4 3

- i. Find the transition matrix P from α to β .
 ii. Find the transition matrix Q from β to α .

Show that $[T]_{\beta} = Q^{-1}[T]_{\alpha}Q$ for the linear transformation T defined by $T(x, y, z) = (2y + x, x - 4y, 3x)$.

OR

- Q.5(B) Define three linear functional on the vector space $V = P_2(\mathbb{R})$ by $f_1(p) = \int_0^1 p(x) dx$, $f_2(p) = \int_0^2 p(x) dx$, $f_3(p) = \int_0^{-1} p(x) dx$. Show that $\{f_1, f_2, f_3\}$ is a basis for V^* by finding its dual basis for V . 10M 4 4

- Q.6(A) i. Let $S = \{v_i\}$, where $v_1 = (1, 1, 0)$, $v_2 = (1, 1, 1)$. Find a basis for S^{\perp} with respect to the Euclidean inner product on \mathbb{R}^3 . 5M 5 3

- ii. Find an orthogonal basis for \mathbb{R}^3 with the Euclidean inner product by applying the Gram-Schmidt orthogonalization to the vectors $x_1 = (1, 0, 1)$, $x_2 = (1, 0, -1)$, $x_3 = (0, 3, 4)$. 5M 5 3

OR

- Q.6(B) Find all the least square solutions to $Ax = b$, where 10M 5 4

$$A = \begin{bmatrix} 1 & -2 & 1 \\ 2 & -3 & -1 \\ -1 & 1 & 2 \\ 3 & -5 & 0 \end{bmatrix}, b = \begin{bmatrix} 1 \\ 0 \\ 1 \\ 0 \end{bmatrix}$$

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech I Year II Semester (R20) Regular & Supplementary End Semester Examinations, July- 2023

LINEAR ALGEBRA AND TRANSFORM CALCULUS

(Electrical & Electronics Engineering)

Time: 3Hrs

Max Marks: 60

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. Find the eigenvalues of a matrix $A = \begin{bmatrix} 1 & 1 \\ 1 & 2 \end{bmatrix}$	1M	1	2
	ii. Define skew symmetric matrix with an example	1M	1	1
	iii. Evaluate $\int_C \frac{z^3 - 3}{z - 3} dz$ where C is the circle $ z = 1$.	1M	2	2
	iv. Find the poles of $f(z) = \frac{z - 3}{z^2 + 2z + 5}$	1M	2	1
	v. Find $L(t \sin 3t)$	1M	3	2
	vi. Find $L^{-1}\left(\frac{1}{s+2}\right)$	1M	3	1
	vii. Find the Fourier sine transform of $f(x) = 3e^{-3x}$.	1M	4	2
	viii. State convolution theorem for Fourier transforms.	1M	4	1
	ix. Find $Z(n^2)$	1M	5	1
	x. Find $Z^{-1}\left(\frac{z}{(z-1)^2}\right)$	1M	5	2
Q.2(A)	Solve the following system of linear equations $x + y + z + w = 0$, $4x + 2y + z + 3w = 0$, $6x + 3y + 4z + 7w = 0$, $2x + y + w = 0$.	10M	1	3
OR				
Q.2(B)	Reduce the quadratic form $3x^2 + 5y^2 + 3z^2 - 2yz + 2zx - 2xy$ to the canonical form and specify the matrix of transformation.	10M	1	3
Q.3(A)	Let C denote the positively oriented boundary of the square whose sides lie along the lines $x = \pm 2$ and $y = \pm 2$. Evaluate $\int_C \frac{e^{-z}}{\left(z - \frac{\pi i}{2}\right)} dz$	10M	2	3
OR				

Q.3(B)	Determine the poles of the function $f(z) = \frac{z^2}{(z-1)^2(z+2)}$ and the residue at each pole. Hence evaluate $\oint_C f(z) dz$, where $C: z = 2.5$	10M	2	3
Q.4(A)	Find the inverse Laplace transforms of $\frac{2s^2 - 6s + 5}{s^3 - 6s^2 + 11s - 6}$	10M	3	3
	OR			
Q.4(B)	Solve $(D^3 - 3D^2 + 3D - 1)y = t^2 e^t$ given that $y(0) = 1, y'(0) = 0, y''(0) = -2$	10M	3	3
Q.5(A)	Solve the integral equation $\int_0^\infty f(\theta) \cos \alpha \theta d\theta = \begin{cases} 1 - \alpha & \text{for } 0 \leq \alpha \leq 1 \\ 0 & \text{for } \alpha > 1 \end{cases}$	10M	4	3
	Hence evaluate $\int_0^\infty \frac{\sin^2 t}{t^2} dt$			
	OR			
Q.5(B)	Find the Fourier sine transform of $\frac{e^{-kx}}{x}$	10M	4	3
Q.6(A)	Using inversion integral method, find the inverse Z-transform of $\frac{z}{(z-1)(z-2)}$	10M	5	3
	OR			
Q.6(B)	Solve $y_{n+2} + 6y_{n+1} + 9y_n = 2^n$ with $y_0 = y_1 = 0$, using Z-transforms.	10M	5	3
	*** END***			

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech I Year II Semester (R20) Regular & Supplementary End Semester Examinations, July - 2023

LINEAR ALGEBRA, COMPLEX VARIABLE AND ORDINARY DIFFERENTIAL EQUATIONS

(Electronics & Communication Engineering)

Time: 3Hrs

Max Marks: 60

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. Under which condition a system of linear equations $AX = b$ has infinite solutions.	1M	1	1
	ii. Find the rank of the matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 6 \\ -1 & -2 & 5 \end{bmatrix}$.	1M	1	1
	iii. Find principal value of $(-i)^i$.	1M	2	1
	iv. Determine the value of $\log i$.	1M	2	2
	v. Find order and degree of a differential equation $(x^2 + 1) \frac{d^2y}{dx^2} - (2x - 1) \frac{dy}{dx} = e^x$.	1M	3	1
	vi. Solve $\frac{dy}{dx} = \frac{y}{x}$.	1M	3	1
	vii. Evaluate $\int z^2 \sin \frac{1}{z} dz$, where C is the positive oriented unit circle $ z = 1$.	1M	4	1
	viii. Classify that the following differential equation is linear or non-linear $(x^2 - ay)dx = (ax - y^2)dy$.	1M	4	1
	ix. Find complementary function for the equation $x^2 \frac{d^2y}{dx^2} - 4x \frac{dy}{dx} + 6y = x$.	1M	5	1
	x. Define linear differential equation with an example.	1M	5	1
Q.2(A)	Using Gauss-Jordan method, find the inverse of the matrix $A = \begin{bmatrix} -1 & 2 & 2 \\ 2 & -1 & 2 \\ 2 & 2 & -1 \end{bmatrix}$.	10M	1	1
OR				
Q.2(B)	Find the Eigen values and Eigen vectors of the matrix $A = \begin{bmatrix} 2 & 0 & 1 \\ 0 & 2 & 0 \\ 1 & 0 & 2 \end{bmatrix}$.	10M	1	3

Q.3(A) State and derive Cauchy-Riemann (CR) equations in Cartesian Coordinates. 10M 2 4

OR

Q.3(B) i) Show that $\log e = 1 + 2n\pi i$, ($n = 0, \pm 1, \pm 2, \pm 3, \dots$). 10M 2 3

ii) Show that $\log(1 - i) = \frac{1}{2} \ln 2 - \frac{\pi}{4} i$

Q.4(A) 5M 2 3

(a) If C is the positively oriented unit circle $|z|=1$. Then evaluate the integral

$$\int_C \frac{\exp(2z)}{z^4} dz$$

(b) By using Cauchy – Residue theorem evaluate the integral $\int_C \frac{(5z-2)dz}{z(z-1)}$ 5M 2 3

where C is the circle $|z| = 2$.

OR

Q.4(B) 5M 3 3

(i) Find the Laurent series that represents the function $f(z) = z^2 \sin \frac{1}{z}$ in the domain $0 < |z| < \infty$ 5M 3 3

(ii) Find the Laurent Series of the function $f(z) = \frac{z+1}{z-1}$ in the domain $1 < |z| < \infty$.

Q.5(A) Solve the differential equation $xy(1 + xy^2) \frac{dy}{dx} = 1$. 10M 4 3

OR

Q.5(B) Solve the differential equation $p^2 + 2py \cot x = y^2$, (where $\frac{dy}{dx} = p$). 10M 4 4

Q.6(A) 10M 5 4

Solve the differential equation $x^3 \frac{d^3y}{dx^3} + 3x^2 \frac{d^2y}{dx^2} + x \frac{dy}{dx} + y = x + \log x$.

OR

Q.6(B) Solve the following differential equation by using the method of the variation of parameters 10M 5 4

$$y'' - 4y' + 4y = e^{-2x}$$

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B. Tech I Year II Semester (R20) Regular & Supplementary End Semester Examinations, July - 2023**PROFESSIONAL ENGLISH**

(Common to All)

Time: 3Hrs

Max Marks: 60

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. Fill in the blank with appropriate conditional. If I became a District Collector, I _____ (eliminate) taxes	1M	1	2
	ii. Write an appropriate suffix for 'Happy'.	1M	1	2
	iii. Fill in the blank with an appropriate modal verb We -----obey the laws.	1M	1	2
	iv. Choose the right auxiliary verb (shouldn't, would, might, needn't) You ----- have written such a long essay. The teacher only asked for 300 words.	1M	1	2
	v. Explain Scanning (a reading technique) with an example.	1M	2	2
	vi. Convert the following sentence into indirect speech He said " I have been reading since morning"	1M	1	2
	vii. Find out formal or informal about the given sentence. Would you park your car there, if you don't mind..?	1M	1	2
	viii. What is a Memo?	1M	1	2
	ix. Define Nonverbal communication?	1M	3	2
	x. My favourite sport is football. (Make a Wh question)	1M	4	2
Q.2(A)	Complete the sentences with suitable verb forms i) When I opened my eyes, I _____ (see) a strange sight. ii) He _____ (teach) English for twelve years. iii) During my last summer holidays, my parents _____ (send) me on a language course to London. iv) He _____ (drive) to work yesterday. v) After he _____ (read) the newspaper, he tidied the room. vi) She _____ (go) to bed at 11 o'clock at night. vii) I _____ (study) in the Delhi School of Economics next year. viii) Look! How the bird _____ (fly)! ix) He _____ (play) the piano when he visited her house. x) She _____ (not, receive) the letter yet.	10M	1	3
OR				
Q.2(B)	Read the following sentences carefully. Give synonymous of the underlined word from each sentence. 1. Windy days are <u>typical</u> of December. 2. Her moods are as <u>changeable</u> as the weather. 3. He tends to be <u>ill-tempered</u> before he has had breakfast. 4. We sailed around the entire <u>boundary</u> of the island. 5. The swindler tried to <u>evade</u> the law. 6. We heard the pots and pans <u>clanking</u> in the kitchen. 7. The defendant was grateful for the judge's <u>kindness</u> . 8. His character was of the highest <u>merit</u> . 9. A chameleon <u>disguises</u> itself by changing color. 10. A good critic must be a man of great <u>honesty</u> .	10M	1	3

Q.3(A)	Write a paragraph on the following topics. i) Impact of Smart phones on human relationship. ii) Demonetization in India.	10M	5	4
OR				
Q.3(B)	Write suitable dialogues for the following conversations. a) You did not understand a few lessons in English. Request your English teacher to explain it to you at his/her convenience b) Ashok has lost his grandmother. His friend Venkat, comes to offer his condolences.	10M	2	3
Q.4(A)	Explain various reading strategies in detail.	10M	2	2
OR				
Q.4(B)	(i) Prepare the questions for the following statements (a) I am studying B. Tech First year (b). My friend gifted this ring to me. (c). He can speak German. (d). She will arrive at ten o'clock (e). They lived in Manchester. (ii) Arrange the following jumbled sentences in order to make a meaningful paragraph.. (a). He used to go to his school and enjoyed studying and mid-day meals there. (b). Besides, they needed his help in odd jobs in the house as well as their fields. C. Karma lived with his parents in a thatched small house in a silent corner of the village. D This all stopped as his parents could not afford to send him to school to impart further education to him.	10M	3	3
Q.5(A)	Imagine that you are the president of Students' clubs. Write dialogues with the members of various clubs for conducting activities with a minimum of twelve exchanges.	10M	4	3
OR				
Q.5(B)	Imagine that you are the representative of your class and you are meeting your professor to organize an industrial visit to ISRO Srihari kota. Write a formal conversation (dialogue) featuring questions (and answers) about: • Permissions required from your college and ISRO, • Transport and food arrangements • Financial needs for the trip. (Minimum 12 exchanges)	10M	4	4
Q.6(A)	You are the class representative. Your class is planning an industrial tour for three days. Write a report to the Principal by using the following points: · Explain the importance and reasons of your tour. · Provide the dates and places of your visit. · Give details of planning and preparation you are doing	10M	5	4
OR				
Q.6(B)	Draft a mail to your manager informing him about the event you are planning to organize in your office after working hours with colleagues regarding evenings"	10M	5	4

*** END***

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

B.Tech I Year I Semester (R20) Supplementary End Semester Examinations, July- 2023

CALCULUS AND DIFFERENTIAL EQUATIONS

(Electrical & Electronics Engineering)

Time: 3Hrs

Max Marks: 60

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 Cauchy's mean value theorem.	1M	1	1
	ii. Calculate $\int_0^{\pi/4} \sec^2 x \, dx$	1M	1	1
	iii. Find $\frac{dy}{dx}$ if $y - e^{7x}x^2 - \sin x = 0$	1M	2	2
	iv. Find ∇f if $f(x, y) = x^2e^y + \cos xy + \ln x$ at $(2, 0)$	1M	2	2
	v. Evaluate $\iint_R dA$, when $0 \leq r \leq 6, 0 \leq \theta \leq \pi$	1M	3	2
	vi. State Stoke's theorem.	1M	3	1
	vii. Write the complementary function of $(D^3 + 2D^2 + D)y = 0$.	1M	4	1
	viii. Find the complementary function of $x^2y'' - xy' + y = 0$.	1M	4	2
	ix. Give one example for nonlinear partial differential equation.	1M	5	1
	x. Test the convergence of the series $\sum_{n=1}^{\infty} \frac{1}{n^{7/2}}$	1M	5	1
Q.2(A)	Prove that (if $0 < a < b$), $\frac{b-a}{\sqrt{1-a^2}} < \sin^{-1}b - \sin^{-1}a < \frac{b-a}{\sqrt{1-b^2}}$	10M	1	3
OR				
Q.2(B)	Find the length of the one arch of the cycloid $x = a(t - \sin t)$, $y = a(1 - \cos t)$	10M	1	3
Q.3(A)	Find all second order derivatives for the function $f(x, y, z) = \log(x + 2y + 3z)$	10M	2	3
OR				
Q.3(B)	Find the point $P(x, y, z)$ on the plane $2x + y - z - 5 = 0$ that is closest to the origin.	10M	2	3
Q.4(A)	Sketch the region of integration, reverse the order of integration, and evaluate the integral $\int_0^2 \int_{x^2}^{2x} (4x + 2) dy \, dx$	10M	3	3

OR

Q.4(B) Use Divergence theorem to evaluate outward flux of $F = x y i + y z j + z x k$ through the surface of the cube cut from the first octant by the planes $x = 1, y = 1, z = 1$. 10M 3 3

Q.5(A) Solve (i) $(x^2 + y^2)dx = 2xydy$ 10M 4 3
(ii) $(2y \sin x + \cos y)dx = (x \sin y + 2 \cos x + \tan y)dy$
OR

Q.5(B) Solve $x^2 y'' + 3xy' + 10y = 0$. 10M 4 3

Q.6(A) Determine the series converges or diverges, a) $\sum_{n=1}^{\infty} \frac{3^n}{n^3 2^n}$ b) $\sum_{n=1}^{\infty} \frac{n!}{10^n}$ 10M 5 3
OR

Q.6(B) Form the partial differential equations by eliminating the arbitrary functions from the following: 10M 5 3

i) $z = x f(x+t) + g(x+t)$ ii) $z = f(x) + e^y g(x)$

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)**B.Tech I Year I Semester (R20) Supplementary End Semester Examinations, July- 2023**
ENGINEERING CALCULUS

(Common to CE, ME, ECE, CSE, CST, AI, DS, CS)

Time: 3Hrs

Max Marks: 60

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 the formula for volume of the solid generated by the revolution about x-axis, of the arc of the curve $y = f(x)$ from $x=a$ to $x=b$	1M	1	1
	ii. Find the value of $\Gamma\left(\frac{7}{2}\right)$	1M	1	2
	iii. State the Lagrange's mean value theorem	1M	2	1
	iv. Evaluate $\lim_{x \rightarrow 0} \frac{x - \sin x}{x^2}$	1M	2	2
	v. State Alternating Series test	1M	3	1
	vi. If $f(x) = e^{2x}$ in $0 < x < 1$ then determine a_0	1M	3	1
	vii. If $f(x, y) = x + y + xy + \sin(x + y) + e^{2y}$ then find $\frac{\partial f}{\partial y}$	1M	4	2
	viii. Write a chain rule for $\frac{dz}{dt}$; when $z = f(x, y, z)$, $x = g(t)$, $y = h(t)$ and $z = k(t)$	1M	4	1
	ix. Evaluate $\int_1^{\sqrt{3}} \int_1^{2x} dy dx$	1M	5	2
	x. State Stoke's theorem	1M	5	1
Q.2(A)	Find the area and length of polar curve $r = a(1 + \sin \theta)$	10M	1	3
OR				
Q.2(B)	Define Beta and Gamma function. Show that $\int_0^{\frac{\pi}{2}} \sqrt{\cos \theta} d\theta \times \int_0^{\frac{\pi}{2}} \frac{d\theta}{\sqrt{\cos \theta}} = \pi$	10M	1	3
Q.3(A)	Prove that (if $0 < a < b < 1$), $\frac{b-a}{1+b^2} < \tan^{-1} b - \tan^{-1} a < \frac{b-a}{1+a^2}$ and hence show that $\frac{\pi}{4} + \frac{3}{25} < \tan^{-1}\left(\frac{4}{3}\right) < \frac{\pi}{4} + \frac{1}{6}$	10M	2	3
OR				
Q.3(B)	(i). Evaluate $\lim_{x \rightarrow a} \left(2 - \frac{x}{a}\right)^{\tan\left(\frac{\pi x}{2a}\right)}$	5M	2	3
	(ii). Find the greatest perimeter of a rectangle so that it is inscribed in a circle of radius 'a'.	5M	2	3

Q.4(A) Determine whether the following series converges or diverges, 10M 3 3

a) $\sum_{n=1}^{\infty} \frac{(2n+3)(2^n+3)}{3^n+2}$ b) $\sum_{n=1}^{\infty} \frac{n!}{10^n}$

OR

Q.4(B) Express $f(x) = x$ as a half-range cosine and sine series in $0 < x < 2$. 10M 3 3

Q.5(A) Find all second order derivatives of (i). $f(x, y) = x^2y + \cos y + y \sin x$ 10M 4 3

ii) $f(x, y) = e^x + x \ln y + y \ln x$ and hence verify mixed derivative theorem.

OR

Q.5(B) A delivery company accepts only rectangular boxes the sum of whose length and girth (perimeter of cross section) does not exceed 108 in. Find the dimensions of an acceptable box of largest volume. 10M 4 3

Q.6(A) Sketch the region of integration, reverse the order of integration, and 10M 5 3

evaluate the integral $\int_0^2 \int_0^{4-x^2} \frac{xe^{2y}}{4-y} dy dx$

OR

Q.6(B) Apply Green's Theorem to evaluate the integral $\oint_C y^2 dx + x^2 dy$ where C : the 10M 5 3

triangle bounded by $x = 0, x + y = 1, y = 0$

*** END***

Hall Ticket No:

Question Paper Code: 20ME101

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

B.Tech I Year II Semester (R20) Regular End Semester Examinations, July - 2023

ENGINEERING GRAPHICS

(Computer Science & Engineering)

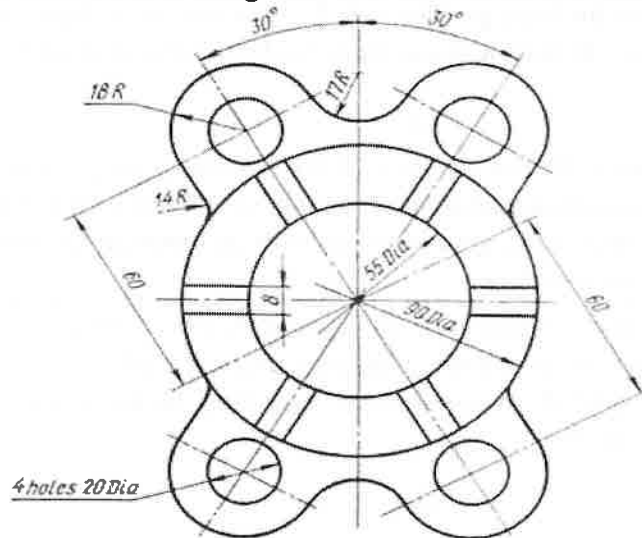
Time: 3Hrs

Max Marks: 60

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 1 to 5 answer either Part-A or B only

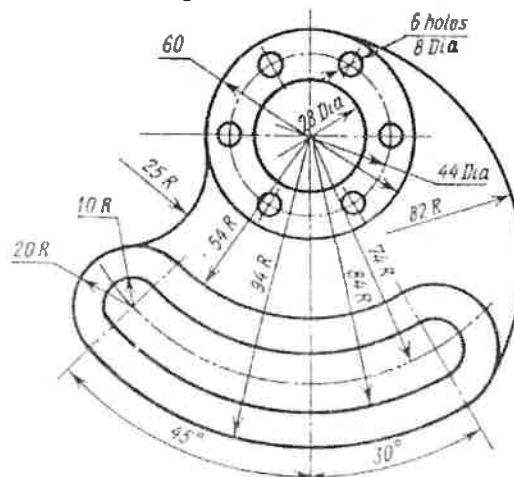
S.No.	Question	Marks	CO	Bl
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Q.1(A)	Draw the figure shown below using Auto CAD commands and dimension it.	12M	1	3
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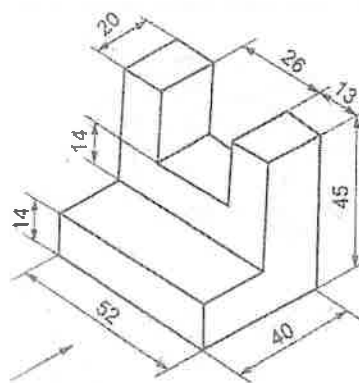


OR

Q.1(B)	Draw the figure shown below using Auto CAD commands and dimension it.	12M	1	3
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Q.2(A)	i. A point G is 25 mm above H.P, 45mm in front of V.P and 40 mm in front of P.P. Draw front view, top view and side view of the point.	6M	2	3
	ii. A point H is 40 mm below H.P, 50mm behind V.P and 30 mm in front of P.P. Draw front view, top view and side view of the point.	6M	2	3
OR				
Q.2(B)	A line AB 90 mm long is inclined at an angle of 30° to H.P and 45° to V.P. The point A is 40 mm above H.P and 35 mm in front of V.P. Draw its Projections and find the apparent inclinations with HP and VP.	12M	2	3
Q.3(A)	A pentagonal pyramid side of base 50 mm and axis 80 mm is resting with one of its slant edge on the HP. The axis of the pyramid is parallel to VP. Draw its projections.	12M	3	3
OR				
Q.3(B)	Draw the projections of a regular hexagon of 30 mm side having one of its sides in the H.P and inclined at 60° to V.P and its surface making an angle of 45° with H.P.	12M	3	3
Q.4(A)	A Pentagonal prism of base edge 40 mm side and axis 80 mm has its base horizontal and an edge of the base parallel to V.P. A horizontal section plane cuts it at a distance of 35 mm above the base. Draw its front view and sectional top view.	12M	4	3
OR				
Q.4(B)	A cylinder of base diameter 40 mm and axis 70 mm is resting on ground with its axis vertical. It is cut by a section plane perpendicular to V.P and inclined at 45° to H.P passing through the top of the generator and cuts all other generators. Draw its development of its lateral surface.	12M	4	3
Q.5(A)	A Vertical cylinder of 90 mm diameter is completely penetrated by another cylinder of 80 mm diameter with their axes bisecting each other at 90° . Draw their projections showing curves of penetration, assuming the axis of penetrating cylinder to be parallel to the V.P.	12M	5	3
OR				
Q.5(B)	Draw Front view ,Topview and sideview for the given isometric view.	12M	5	3



*** END***

Hall Ticket No:

Question Paper Code: 20ME101

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

B.Tech I Year II Semester (R20) Regular End Semester Examinations, July - 2023

ENGINEERING GRAPHICS

(Computer Science & Engineering)

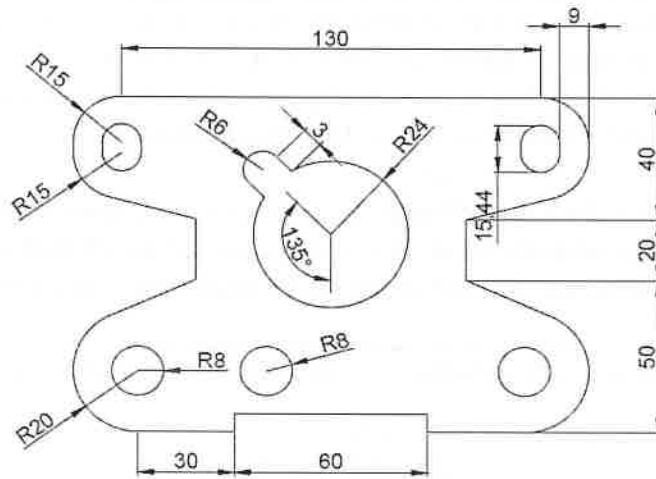
Time: 3Hrs

Max Marks: 60

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 1 to 5 answer either Part-A or B only

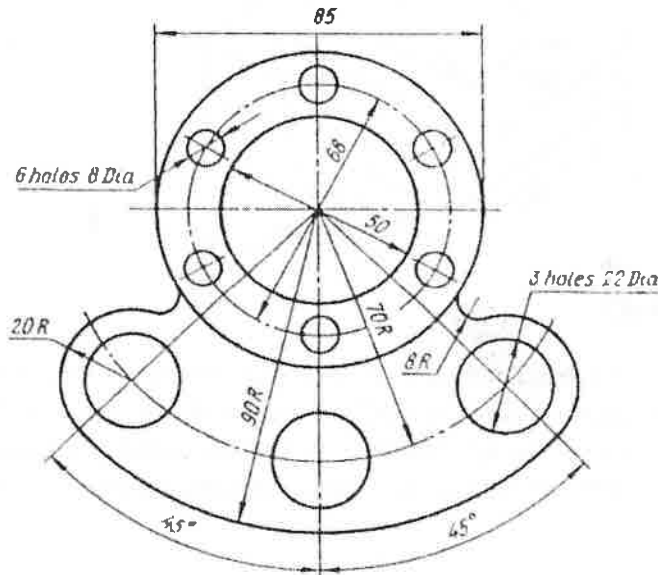
S.No.	Question	Marks	CO	BL
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Q.1(A)	Draw the figure shown below using Auto CAD commands and dimension it.	12M	1	3
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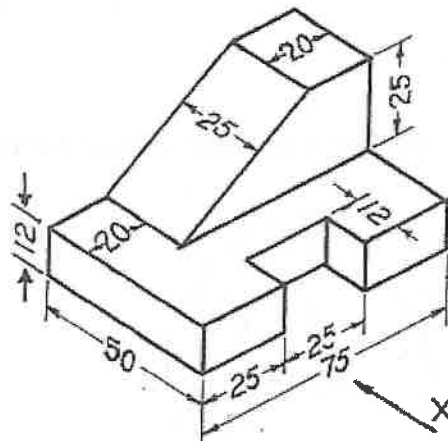


OR

Q.1(B)	Draw the figure shown below using Auto CAD commands and dimension it.	12M	1	3
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Q.2(A)	The Top view of an 80 mm long line measures 60 mm. While the length of its Front view is 40 mm. It's one end A is in H.P and 25 mm in front of V.P. Draw the projections of AB and determine its inclinations with H.P and V.P	12M	2	3
OR				
Q.2(B)	Draw the projections of the following points on the same reference line XY by keeping the distance between the projectors are 40mm. <ul style="list-style-type: none"> ➤ Point A, 50 mm above the H.P. and 35 mm in front of the V.P. ➤ Point B, 60 mm below the H.P. and 30 mm behind the V.P. ➤ Point C, 30 mm above the H.P. and 65 mm behind the V.P. 	12M	2	3
Q.3(A)	A square ABCD of 45 mm side has its corner A in the H.P. its diagonal AC is inclined at 30° to the H.P and the diagonal BD inclined at 45° to the VP and parallel to H.P. Draw its projections.	12M	3	3
OR				
Q.3(B)	A Hexagonal prism of base edge 35 mm and axis 70 mm has an edge of its base in the V.P such that the axis is inclined at 30° to V.P and parallel to H.P. Draw its projections.	12M	3	3
Q.4(A)	A hexagonal prism of base side 40 mm and height 90 mm resting on its base on H.P with one rectangular face perpendicular to V.P. It is cut by a section plane inclined at 45 degrees to the H.P and passing though the midpoint of the axis. Draw the development of the lateral surface of the truncated prism.	12M	4	3
OR				
Q.4(B)	A cylinder of base diameter 60 mm and height 90 mm rests on its base on HP. It is cut by section plane perpendicular to VP and inclined at 45° to HP and passing through the axis at a distance 50 mm from base. Draw the front view and sectional top view.	12M	4	3
Q.5(A)	Draw front view ,topview and side view for the isometric view given below	12M	5	3



OR

Q.5(B)	A vertical square prism, base 60 mm side and height 100 mm. It is completely penetrated by another square prism, base 50 mm side and 120 mm long, faces of which are equally inclined to the VP. The axes of the two prisms are parallel to the VP and bisect each other at right angles. Draw the projections showing lines of the inter section.	12M	5	3
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*** END***

Hall Ticket No:

Question Paper Code: 20ME101

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

B.Tech I Year II Semester (R20) Regular End Semester Examinations, July - 2023

ENGINEERING GRAPHICS

(Common to CSE(AI) and CSE(CS))

Time: 3Hrs

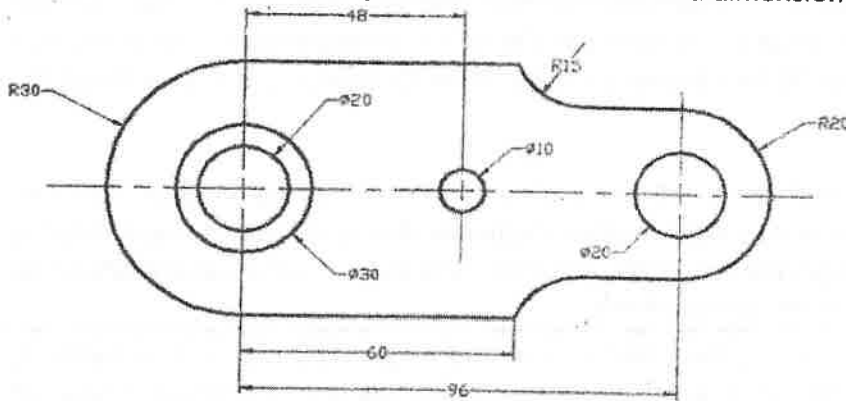
Max Marks: 60

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 1 to 5 answer either Part-A or B only

S.No.	Question	Marks	CO	B
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Q.1(A) Draw the figure shown below using Auto CAD commands and dimension it.

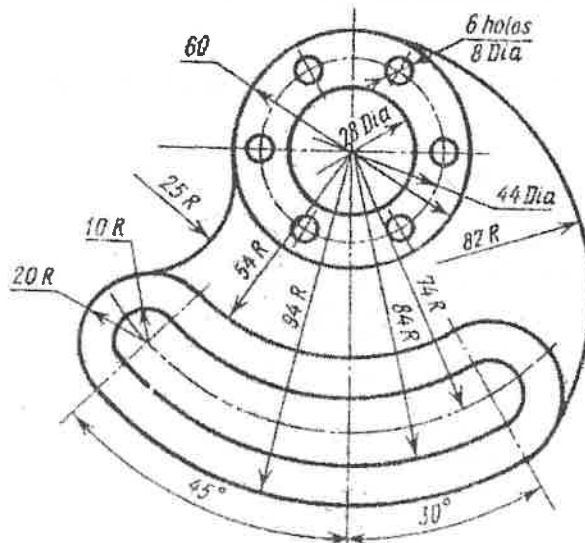
12M 1 3



OR

Q.1(B) Draw the figure shown below using Auto CAD commands and dimension it.

12M 1 3



Q.2(A) A line CD 60 mm long is inclined at an angle of 30° to HP and 45° to VP. The point C is 40 mm above HP and 50 mm in front of VP. Draw the projection of the straight line and find its apparent inclinations. 6M 2

OR

Q.2(B) Draw the projections of the following points on the same ground line. Name the quadrants. 12M 2

- Point A, 25 mm in front of the V.P. and 40 mm above the H.P.
- Point B, 35mm below the H.P. and on the V.P.
- Point C, 20 mm below the H.P. and 60 mm behind the V.P.

Q.3(A) Draw the projections of a regular pentagon of 40 mm side, which is resting with its base side on the HP. The surface of the pentagon is inclined at 45° to the HP and the base side resting on the HP is inclined at 60° to the VP. 12M 3

OR

Q.3(B) A Hexagonal Pyramid of base edge 35 mm and height 70 mm has a triangular face on the ground and the axis is parallel to V.P. Draw its projections. 12M 3

Q.4(A) A Pentagonal prism of base edge 40 mm side and axis 60 mm has its base horizontal and an edge of the base parallel to V.P. A horizontal section plane cuts it at a distance of 30 mm above the base. Draw its front view and sectional top view. 12M 4

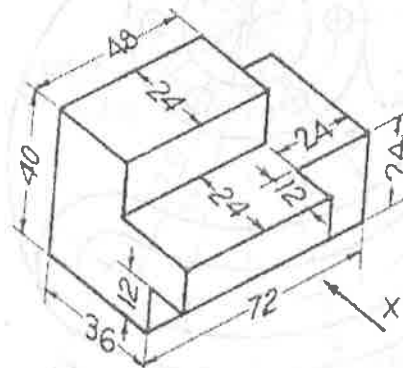
OR

Q.4(B) A cylinder of base diameter 60 mm and axis 80 mm is resting on ground with its axis vertical. It is cut by a section plane perpendicular to V.P and inclined at 45° to H.P passing through the top of the generator and cuts all other generators. Draw its development of its lateral surface. 12M 4

Q.5(A) A vertical square prism, base 50mm side and height 100 mm. It is completely penetrated by another square prism, base 45 mm side and 120 mm long, faces of which are equally inclined to the VP. The axes of the two prisms are parallel to the VP and bisect each other at right angles. Draw the projections showing lines of the inter section. 12M 5

OR

Q.5(B) Draw Front view ,Topview and sideview for the given isometric view. 12M 5



*** END***

Hall Ticket No:

Question Paper Code: 20ME101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech I Year II Semester (R20) Regular End Semester Examinations, July - 2023

ENGINEERING GRAPHICS

(Common to CSE(AI) and CSE(CS))

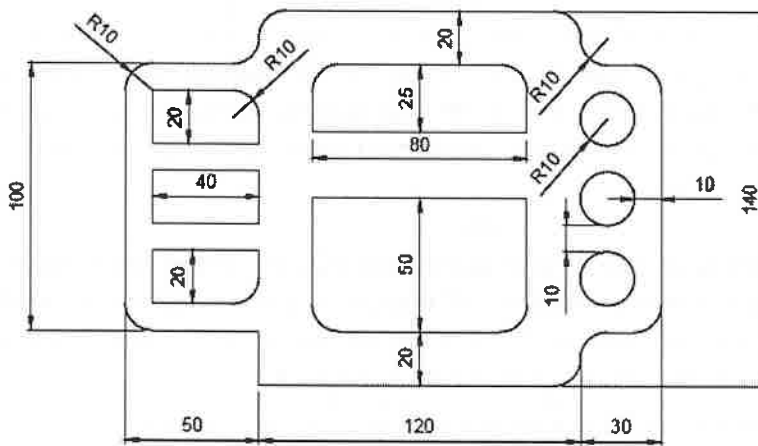
Time: 3Hrs

Max Marks: 60

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 1 to 5 answer either Part-A or B only

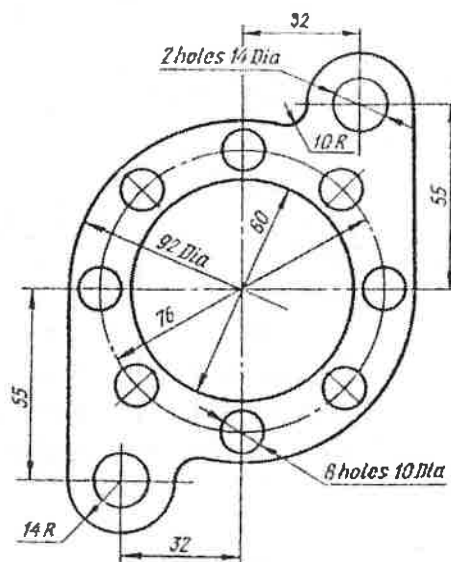
S.No.	Question	Marks	CO
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Q.1(A) Draw the figure shown below using Auto CAD commands and dimension it. 12M 1



OR

Q.1(B) Draw the figure shown below using Auto CAD commands and dimension it. 12M 1



Q.2(A) Two points C and D are in the H.P. The point C is 40 mm in front of V.P and D is behind the V.P. the distance between their projectors is 60 mm and line joining their top views makes an angle of 40° with XY. Find the distance of the point C from the V.P. Also state the quadrants in which point C and D lies.

OR

Q.2(B) A line CD, 100 mm long, measures 60 mm in front view and 45 mm in top view. Draw the two views of the line if it fully lies in the first quadrant. Find the true inclinations of the line. Point C lies at a distance 25 mm from the reference planes.

Q.3(A) Draw the projections of a circle of 60 mm diameter resting in the H.P and a point A on the circumference. Its plane is inclined at 45° to the HP and the top view of the diameter AB making an angle of 30° with the VP.

OR

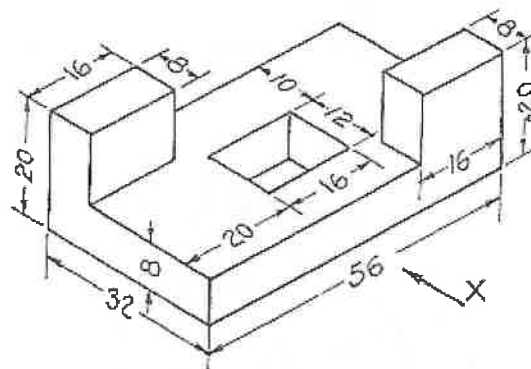
Q.3(B) A Pentagonal pyramid of base side 35 mm and axis 70 mm has an edge of its base on the ground. The axis is inclined at 40° to the ground and parallel to V.P. Draw its projections.

Q.4(A) A square prism side of base 60 mm and axis 90 mm long Its base is resting on HP and its face is equally inclined to VP. It is cut by section plane which is perpendicular to VP and inclined 45° to HP and passing through a point 25mm from the top of the axis of the prism. Draw front view, sectional top view and true shape of the square prism

OR

Q.4(B) A Hexagonal prism of base side 45 mm and height 85 mm resting on its base on H.P with the rectangular face parallel to V.P. It is cut by a section plane inclined at 45 degrees to the H.P and passing through the midpoint of the axis. Draw the development of the lateral surface of the truncated prism.

Q.5(A) Draw front view ,topview and sideviewfor the isometric view given below



OR

Q.5(B) A Vertical cylinder of 60 mm diameter is completely penetrated by another cylinder of 40 mm diameter, their axes bisecting each other at right angles. Draw their projections showing curves of penetration, assuming the axis of penetrating cylinder to be parallel to the V.P.

*** END***

Hall Ticket No:

Question Paper Code: 20ME101

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

B.Tech I Year II Semester (R20) Regular End Semester Examinations, July - 2023

ENGINEERING GRAPHICS

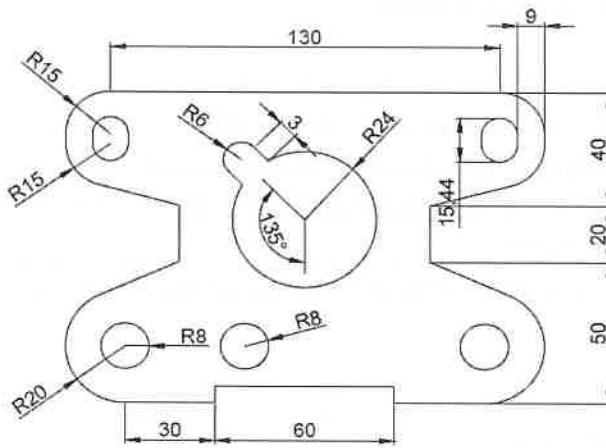
(CSE(Data Science))

Time: 3Hrs

Max Marks: 60

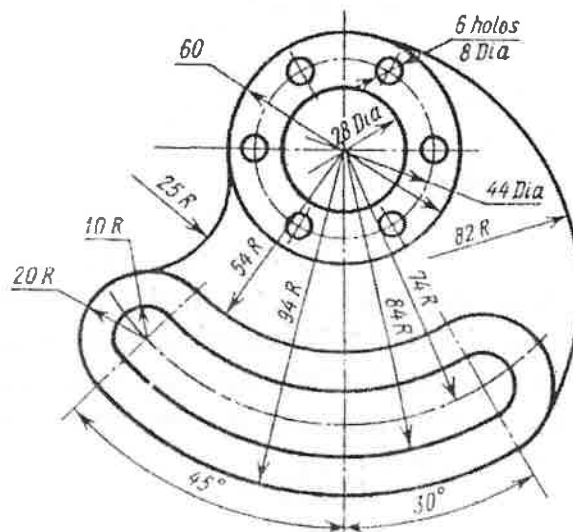
Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 to 5 answer either A or B only

Q.No	Question	Marks	CO	BL
Q.1(A)	Draw the figure shown below using Auto CAD commands and dimension it.	12M	1	3



OR

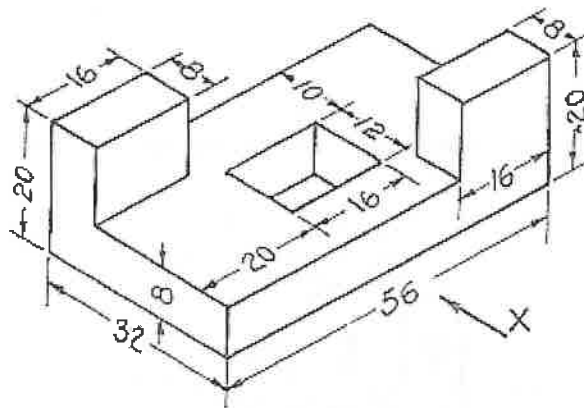
Q.1(B)	Draw the figure shown below using Auto CAD commands and dimension it.	12M	1	3
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Q.2(A)	A line AB 70mm long is inclined at an angle of 30° to H.P and 45° to V.P. The point A is 30mm above H.P and 30mm in front of V.P. Draw its Projections and find the apparent inclinations with F.V&T.V.	12M	2	3
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OR

Q.2(B)	Draw the projection of line AB 90mm long, its midpoint M being 50mm above H.P and 40mm in front of V.P. The end A is 20mm above H.P and 10mm in front of the V.P. Show the inclinations of the line with H.P and V.P.	12M	2	3
Q.3(A)	A square ABCD of 50mm side has its corner A in the H.P. its diagonal AC is inclined at 30° to the H.P and the diagonal BD inclined at 45° to the VP and parallel to H.P. Draw its projections.	12M	3	3
OR				
Q.3(B)	A pentagonal pyramid side of base 30 mm and axis 65 mm is resting with one of its slant edge on the HP. The axis of the pyramid is parallel to VP. Draw its projections.	12M	3	3
Q.4(A)	A square prism side of base 40mm and axis 70mm long Its base is resting on HP and its face is equally inclined to VP. It is cut by section plane which is perpendicular to VP and inclined 45° to HP and passing through a point 25mm from the top of the axis of the prism. Draw front view, sectional top view and true shape of the square prism.	12M	4	3
OR				
Q.4(B)	A cube of 50 mm long edges is resting on the H.P. with a vertical face inclined at 30° to the V.P. It is cut by a section plane, perpendicular to the V.P. inclined at 30° to the H.P. and passing through a point on the axis, 38 mm above the H.P. Draw the development of the lateral surface of the remaining portion of the cube.	12M	4	3
Q.5(A)	Draw front view ,topview and left side viewfor the isometric view given below	12M	5	3



OR

Q.5(B)	A vertical square prism, base 50mm side and height 90mm is completely penetrated by another square prism, base 40mm side and 90mm long, faces of which are equally inclined to the VP. The axes of the two prisms are parallel to the VP and bisect each other at right angles. Draw the projections showing lines of the intersection.	12M	5	3
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*** END***

Hall Ticket No:

Question Paper Code: 20ME101

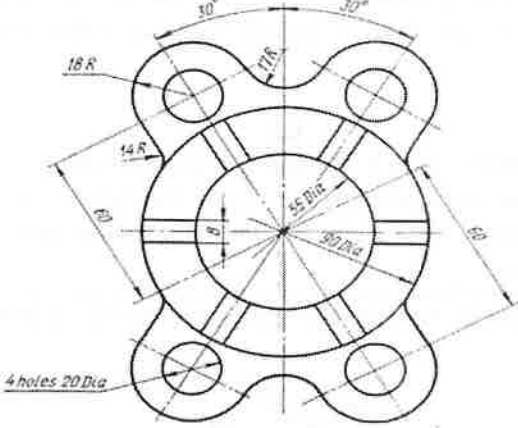
MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
 (UGC-AUTONOMOUS)
B.Tech I Year II Semester (R20) Regular End Semester Examinations, July - 2023
ENGINEERING GRAPHICS
 (CSE(Data Science))

Time: 3Hrs

Max Marks: 60

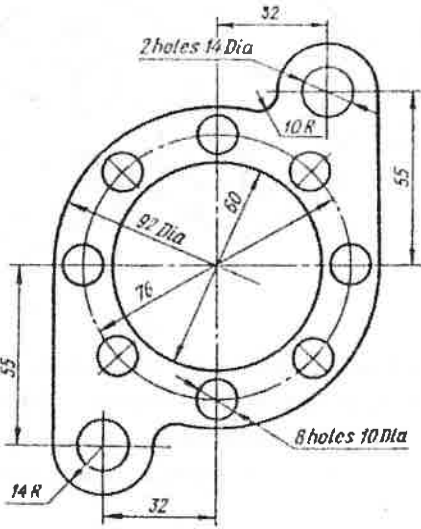
Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 to 5 answer either A or B only

Q.No	Question	Marks	CO	BL
Q.1(A)	Draw the figure shown below using Auto CAD commands and dimension it.	12M	1	3



OR

Q.1(B)	Draw the figure shown below using Auto CAD commands and dimension it.	12M	1	3
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Q.2(A)	Draw the projections of the following points on the same reference line XY by keeping the distance between the projectors are 40mm. Also state mention the Quadrant in which given points lies.	12M	2	3
	<ul style="list-style-type: none"> ➤ Point A, 40mm above the H.P. and 30mm in front of the V.P. ➤ Point B, 50mm below the H.P. and 40mm behind the V.P. ➤ Point C, 35mm above the H.P. and 55mm behind the V.P. 			

OR

Q.2(B) A line CD, 90mm long, measures 72mm in front view and 65mm in top view. 12M 2 3
Draw the two views of the line if it fully lies in the first quadrant. Also, find the true inclinations of the line. Point C lies at a distance 20mm from the reference planes.

Q.3(A) A square ABCD of 50mm side, has its corner A in the H.P, its diagonal AC is 12M 3 3
inclined at 30° to the H.P and the diagonal BD is inclined at 45° to the V.P and parallel to H.P. Draw its projections.

OR

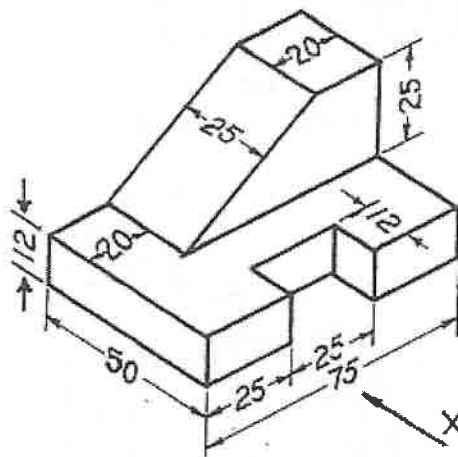
Q.3(B) A Pentagonal pyramid of base side 30mm and axis 65mm has an edge of its base 12M 3 3
on the ground. The axis is inclined at 40° to the ground and parallel to V.P. Draw its projections.

Q.4(A) A hexagonal prism of side 50 mm and 60mm height, is resting on HP on one of its 12M 4 3
base with two vertical faces being parallel to VP. It is cut by a vertical plane inclined at 45° to HP and passing through a point on the axis at distance of 30 mm from the base. Draw its top view, sectional front view and true shape of section.

OR

Q.4(B) A cylinder of base 50mm and axis 60mm is resting on ground with its axis vertical. 12M 4 3
It is cut by a section plane perpendicular to V.P and inclined at 45° to H.P passing through the top of the generator and cuts all other generators. Draw its development of its lateral surface.

Q.5(A) Draw front view ,topview and left side viewfor the isometric view given below 12M 5 3



OR

Q.5(B) A Vertical cylinder of 80mm diameter is completely penetrated by another 12M 5 3
cylinder of 60mm diameter, their axes bisecting each other at right angles. Draw their projections showing curves of penetration, assuming the axis of penetrating cylinder to be parallel to the V.P.(Assume height of the both cylinders suitable)

*** END***

Hall Ticket No:

Question Paper Code: 20ME101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech I Year I & II Semester (R20) Supplementary End Semester Examinations, July - 2023

ENGINEERING GRAPHICS

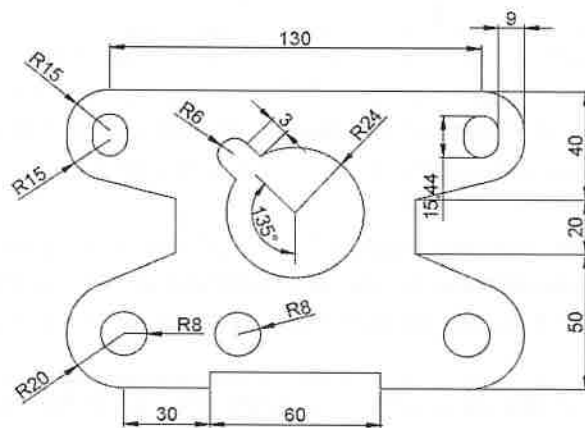
(Common to All)

Time: 3Hrs

Max Marks: 60

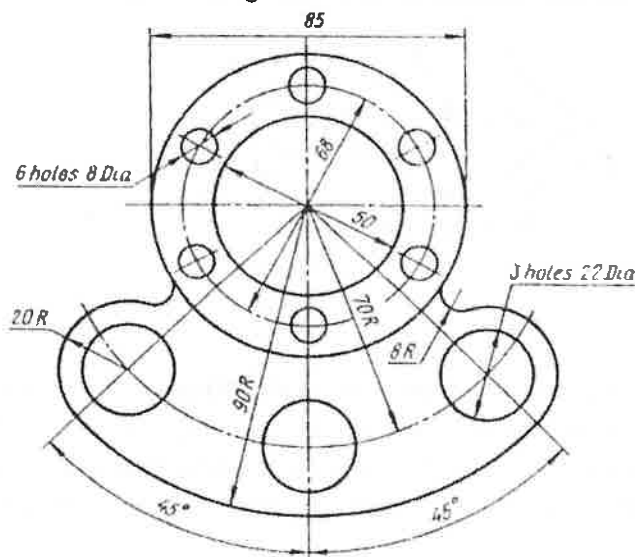
Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 1 to 5 answer either Part-A or B only

S.No.	Question	Marks	CO	BL
Q.1(A)	Draw the figure shown below using Auto CAD commands and dimension it.	12M	1	3

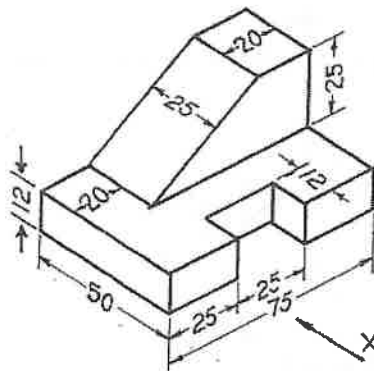


OR

Q.1(B)	Draw the figure shown below using Auto CAD commands and dimension it.	12M	1	3
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- Q.2(A) The Top view of a 85mm long line measures 55mm. While the length of its Front view is 45mm. Its one end A is in H.P and 20mm in front of V.P. Draw the projections of AB and determine its inclinations with H.P and V.P 12M 2 3
- OR**
- Q.2(B) Draw the projections of the following points on the same reference line XY by keeping the distance between the projectors are 40mm. 12M 2 3
- Point A, 40mm above the H.P. and 30mm in front of the V.P.
 - Point B, 50mm below the H.P. and 40mm behind the V.P.
 - Point C, 35mm above the H.P. and 55mm behind the V.P.
-
- Q.3(A) A square ABCD of 50mm side has its corner A in the H.P. its diagonal AC is inclined at 30° to the H.P and the diagonal BD inclined at 45° to the VP and parallel to H.P. Draw its projections. 12M 3 3
- OR**
- Q.3(B) A Hexagonal prism of base edge 30 mm and axis 70 mm has an edge of its base in the V.P such that the axis is inclined at 30° to V.P and parallel to H.P. Draw its projections. 12M 3 3
-
- Q.4(A) A hexagonal prism of base side 30mm and height 80 mm resting on its base on H.P with one rectangular face perpendicular to V.P. It is cut by a section plane inclined at 45 degrees to the H.P and passing through the midpoint of the axis. Draw the development of the lateral surface of the truncated prism. 12M 4 3
- OR**
- Q.4(B) A cylinder of base diameter 40 mm and height 80 mm rests on its base on HP. It is cut by section plane perpendicular to VP and inclined at 45° to HP and passing through the axis at a distance 40 mm from base. Draw the front view and sectional top view. 12M 4 3
-
- Q.5(A) Draw front view ,topview and side view for the isometric view given below 12M 5 3



OR

- Q.5(B) A vertical square prism, base 50mm side and height 90mm. It is completely penetrated by another square prism, base 40mm side and 100mm long, faces of which are equally inclined to the VP. The axes of the two prisms are parallel to the VP and bisect each other at right angles. Draw the projections showing lines of the inter section. 12M 5 3

*** END***

Hall Ticket No:

Question Paper Code: 20ME101

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

B.Tech I Year I & II Semester (R20) Supplementary End Semester Examinations, July - 2023

ENGINEERING GRAPHICS

(Common to All)

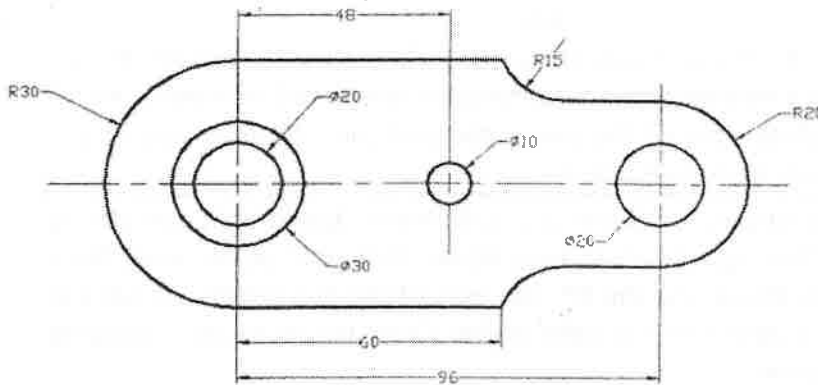
Time: 3Hrs

Max Marks: 60

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 1 to 5 answer either Part-A or B only

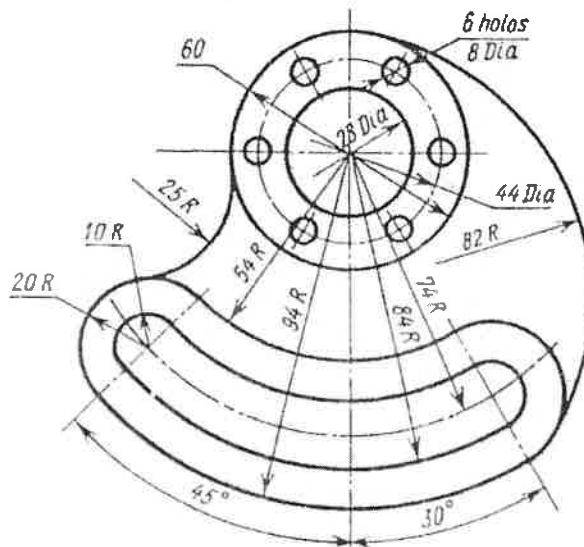
S.No.	Question	Marks	CO	BL
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Q.1(A) Draw the figure shown below using Auto CAD commands and dimension it. 12M 1 3



OR

Q.1(B) Draw the figure shown below using Auto CAD commands and dimension it. 12M 1 3



Q.2(A) A line CD 80mm long is inclined at an angle of 30° to HP and 45° to VP. The point C is 30mm above HP and 40mm in front of VP. Draw the projection of the straight line and find its apparent inclinations. 6M 2 3

OR

- Q.2(B) Draw the projections of the following points on the same ground line. 12M 2 3
- Point A, 20mm in front of the V.P. and 60mm above the H.P.
 - Point B, 25mm below the H.P. and on the V.P.
 - Point C, 15mm below the H.P. and 50mm behind the V.P.

-
- Q.3(A) Draw the projections of a regular pentagon of 25mm side, which is resting with its base side on the HP. The surface of the pentagon is inclined at 45° to the HP and the base side resting on the HP is inclined at 60° to the VP. 12M 3 3

OR

- Q.3(B) A Hexagonal Pyramid of base edge 30 mm and height 60mm has a triangular face on the ground and the axis is parallel to V.P. Draw its projections. 12M 3 3

-
- Q.4(A) A Pentagonal prism of base edge 30mm side and axis 65mm has its base horizontal and an edge of the base parallel to V.P. A horizontal section plane cuts it at a distance of 25mm above the base. Draw its front view and sectional top view. 12M 4 3

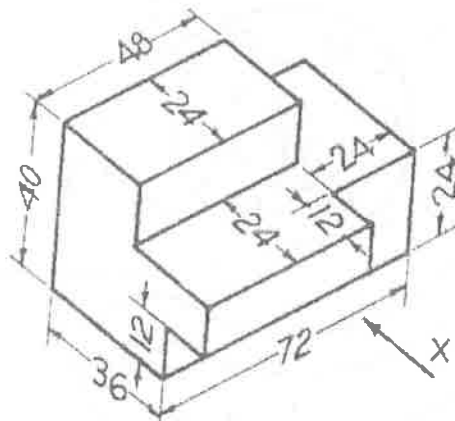
OR

- 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 V.P and inclined at 45° to H.P passing through the top of the generator and cuts all other generators. Draw its development of its lateral surface. 12M 4 3

-
- Q.5(A) A vertical square prism, base 50mm side and height 90mm. It is completely penetrated by another square prism, base 40mm side and 100mm long, faces of which are equally inclined to the VP. The axes of the two prisms are parallel to the VP and bisect each other at right angles. Draw the projections showing lines of the intersection. 12M 5 3

OR

- Q.5(B) Draw Front view ,Topview and side view for the given isometric view. 12M 5 3



*** END***