Enrollment No./Seat No.:

GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering - SEMESTER - 1/2 EXAMINATION - WINTER 2025

Subject Code: 3110019 **Date: 31-12-2025**

Subject Name: Remedial Mathematics

Time: 02:30 PM TO 05:00 PM **Total Marks: 70**

Instructions

2. Make suitable assumptions wherever necessary.

3. Figures to the right indicate full marks.

			Marks
Q.1	**(a)**	Define slope of a line and find the slope of the line joining the points (2, 3) and (–1, 5).	**03**
	(b)	Find the equation of a line passing through (2, –3) and perpendicular to the line 3x–4y +7= 0.	**04**
	(c)	Find the distance of the point (4, –3) from the line 3x + 4y – 5 = 0.	**07**
Q.2	**(a)**	Define real-valued function with examples.	**03**
	(b)	Express sin3x and cos3x.	**04**
	(c)	Prove $\sin(x+y)\sin(x-y)=\sin^2x-\sin^2y$.	**07**
		OR	
	(c)	Find $\lim_{x\to 0}\frac{sin3x}{x}$ Also Define limits and continuity of function	**07**
Q.3	**(a)**	Check continuity of $f(x)=x^2$ $(x<1)$, $3x-2$ $(x\geq 1)$ at $x=1$.	**03**
	(b)	If $y=x^2\sin x$, find dy/dx and d^2y/dx^2.	**04**
	(c)	Differentiate the function $\frac{sin(3x+5)}{cosx}$	**07**
		OR	
	(a)	Find $\int(sinx+cos2x)dx$	**03**
	(b)	Find $\int_1^2(4X^3-5X^2+6X+9)dX$	**04**
	(c)	Integrate the function $\frac{x}{(x+1)(x+2)}dx$	**07**
Q.4	**(a)**	Find the transpose of the given matrice $\begin{pmatrix}1 & 2\\ 0 & 8\end{pmatrix}$	**03**
	(b)	Write Minors and Cofactors of the determiant $\begin{pmatrix}2 & -4\\ 0 & 3\end{pmatrix}$	**04**

(c) Find the inverse of the matric **07**

$$\begin{pmatrix} 1 & 2 & 3 \\ 0 & 2 & 4 \\ 0 & 0 & 5 \end{pmatrix}$$

OR

(a) Compute the products **03**

$$\begin{bmatrix} 1 & -2 \\ 2 & 3 \end{bmatrix} \begin{pmatrix} 1 & 2 & 3 \\ 2 & 3 & 1 \end{pmatrix}$$

(b) If A and B are symmetric matrices , prove that AB - BA is a skew symmetric matrix **04**

(c) Slove system of linear equation, using matrix method : 4x - 3y = 3 and 3x - 5y = 7 **07**

Q.5 **(a)** **03**

The degree of the differential equation 1) y'' + sinx - 5 = 0 2) $\frac{dy}{dx}$ = sin (2x - 8)

(b) **04**

Find the solution of the differential equation $x^5 \frac{dy}{dx} = -y^5$

(c) **07**

Find a particular solution of the differential equation $\frac{dy}{dx} + ycotx = 4xcosecx$
given that y = 0 when x = 0

OR

(a) $y = x^2 + 2x + c$ is solution of y' - 2x - 2 = 0 ? **03**

(b) **04**

Find the particular solution of the : $x(x^2 - 1)\frac{dy}{dx} = 1; y = 0, x = 2$

(c) **07**

Find the solution of the $\frac{dy}{dx} + 2ytanx = sinx$ when y = 0 , x = 0

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