Enrollment No./Seat No.:

GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Vocation - SEMESTER - II EXAMINATION - WINTER 2025

Subject Code: 21120204 **Date: 03-12-2025**

Subject Name: Basic Mathematics

Time: 02:30 PM to 04:30 PM **Total Marks: 50**

Instructions

1. **Attempt all questions.**
2. **Make Suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Use of simple calculators and non-programmable scientific calculators are permitted.**

			Marks
Q.1	**(a)**	Discuss the methods of representing the sets.	**05**
	(b)	Which of the following relations are functions? Give reasons and also find the domain and range of the function. (i) f = {(1, 3), (1, 5), (2, 3), (2, 5)} (ii) g = {(2, 1), (5, 1), (8, 1), (11, 1)}	**05**
Q.2	**(a)**	Express the sum, difference, product, and quotient of the following complex numbers as a complex number. $Z_1 = -2 + i$ $Z_2 = 1 - 2i$	**05**
	(b)	Find the determinant of the given matrix: $\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 2 & 9 \end{bmatrix}$	**05**
		OR	
	(b)	If A={1,2,3}, B={2,3,4}, C={1,3,4} and D= {2,4,5} , then verify that $(A \times B) \cap (C \times D) = (A \cap C) \times (B \cap D)$.	**05**
Q.3	**(a)**	Explain the matrix operations with suitable example.	**05**
	(b)	Find the sample variance of the data set 2, 6, 12, 15.	**05**
		OR	
	(a)	Find the probability of getting a numbered card when a card is drawn from the pack of 52 cards.	**05**
	(b)	Differentiate between the Permutation and Combination.	**05**
Q.4	**(a)**	Simplify the Boolean function F = AB + (AC)′ + AB′C(AB + C).	**05**
	(b)	A coin is tossed, and a die is rolled. What is the probability that the coin shows the head and the die shows 3?	**05**
		OR	
	(a)	Explain the absolute measures of dispersion with suitable example.	**05**

(b) Draw the truth table of the given Boolean expression: A . ¬ (B + (C.D)). **05**

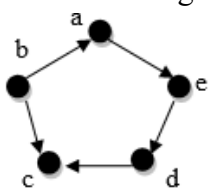
Q.5 **(a)** Solve the given quadratic equation: $3x^2 - 5x + 2 = 0$. **05**

(b) Prove the De - Morgan's law using the truth table. **05**

OR

(a) Define the terms: Graph, Sub graph, Complete Graph, Regular Graph and Bipartite Graph. **05**

(b) Find the in degree, Out degree and total degree for the given graph: **05**



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