Enrollment No./Seat No.:

GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Vocation - SEMESTER - II EXAMINATION - WINTER 2025

Subject Code: BV02009021 **Date: 01-12-2025**

Subject Name: 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)**	Find the value of sin15°.	**05**
	(b)	If z=2-3i, find the multiplicative inverse of z.	**05**
Q.2	**(a)**	Let f:A→B, where A={1,2,3}, f(x)=x^2, and B={1,2,3,4,5,6,7,8,9,10}. Determine the domain, co-domain, and range of the function f.	**05**
	(b)	In a school, every student plays either cricket, chess, or both. It is given that 5000 students play cricket, 2500 play chess, and 1000 play both. Using set operation, find the total number of students in the school.	**05**
		OR	
	(b)	Determine an equivalence relation. List the three necessary properties.	**05**
Q.3	**(a)**	Solve the equation $x^2+6x+8=0$ to find the value(s) of x.	**05**
	(b)	Find A^{-1}, if it exists. $A = \begin{bmatrix} 2 & 5 \\ 3 & 8 \end{bmatrix}$	**05**
		OR	
	(a)	Explain Graph and Sub graph in detail with suitable example.	**05**
	(b)	Solve the given system of equations using the matrix method: 5x+2y=4 x+3y=6	**05**
Q.4	**(a)**	Describe combinations and permutations with appropriate examples.	**05**
	(b)	Define the terms in context to probability with suitable example: a) Probability b) Event c) Experiment	**05**

OR

	(a)	If die is rolled, then find the variance and standard deviation of the possibilities.	**05**
	(b)	A hand of 7 cards is drawn from a well-shuffled deck of 52 cards. Find the probability that the hand contains: (i) all 4 Kings, (ii) exactly 3 Kings, (iii) at least 3 Kings.	**05**
Q.5	**(a)**	Explain the concept of Degree of Vertex in detail with suitable example.	**05**
	(b)	Write the reduced from for the Boolean expression (AB'(C+BD)+A'B')C.	**05**

OR

	(a)	In Boolean Algebra: State D'Morgan's law and prove it.	**05**
	(b)	Write the laws of Boolean algebra.	**05**

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