

GUJARAT TECHNOLOGICAL UNIVERSITY**B.VOC- SEMESTER-I EXAMINATION – WINTER 2025****Subject Code:1110701****Date:27-11-2025****Subject Name: Basic Mathematics****Time:10:30 AM TO 12:30 PM****Total Marks:50****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		Marks
Q.1	(a) Define length (Magnitude) of a vector and hence find the length of following vectors, i. $2\hat{i} + 3\hat{j} + 6\hat{k}$ ii. $\hat{i} - 2\hat{j} + 2\hat{k}$	05
	(b) Enlist types of matrixes with their example.	05
Q.2	(a) Solve the linear equations using matrix method: $2X + 3Y = 1$, $Y - 4X = 2$	05
	(b) Find the roots of the equation $x^2 - x - 1 = 0$.	05
OR		
	(b) If $z = 3 + 5i$ then find inverse of z .	05
Q.3	(a) What are logic gates? Explain OR, AND and NOR gate with their block diagram symbol and truth table.	05
	(b) Show that minimization of $F1 = A'BC + AB'C + ABC' + ABC$ $F2 = AB + BC + AC$	05
OR		
Q.3	(a) Design logic circuit for Boolean expression $A' + BC$	05
	(b) Express the Boolean function $F = x + yz$ as a product of maxterms	05
Q.4	(a) $Y = \text{Log}(\text{Sin}x / 1 + \text{Cos}x)$ then find dy/dx .	05
	(b) $\int \log x \, dx$	05
OR		
Q.4	(a) $X + Y = \text{Sin}(X + Y)$ then find dy/dx .	05
	(b) $\int (4x^2 + 3x + 3) \, dx$	05
Q.5	(a) Solve: $2dy/dx = y(x+2)/x$	05
	(b) Form a differential equation from $y = ax^2 + bx$	05
OR		
Q.5	(a) $Y = \text{Sin}(\ln x)/x$ then find dy/dx	05
	(b) Give two examples of differential equation of order 2 and degree 1	05
