



Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

SCHOOL OF ADVANCED SCIENCES

Fall Semester 2024-2025

Continuous Assessment Test – I

Programme Name & Branch : B.Tech – Common

Slot: B2+TB2+TBB2

Course Name & code: BMAT100N – Mathematics

Class Number (s): VL2024250108690

Exam Duration: 90 Min.

Maximum Marks: 50

Answer ALL Questions

- | Q.No. | Question | Max Marks |
|-------|---|-----------|
| 1. a) | Find the values of x, y, z and a which satisfies the matrix equation
$\begin{pmatrix} x+3 & 2y+x \\ z-1 & 4a-6 \end{pmatrix} = \begin{pmatrix} 0 & -7 \\ 3 & 2a \end{pmatrix}.$ | [10] |
| b) | If $A = \begin{pmatrix} 1 & -1 \\ 3 & 0 \end{pmatrix}$ and $B = \begin{pmatrix} 3 & 1 \\ 1 & 4 \end{pmatrix}$ then find AB . | |
| 2. | Determine the product AB for the matrices
$A = \begin{pmatrix} 4 & 2 & 1 & 3 \\ 6 & 3 & 4 & 7 \\ 2 & 1 & 0 & 1 \end{pmatrix}$ and $B = \begin{pmatrix} 8 & -6 & 2 \\ 6 & 7 & -4 \\ 2 & -4 & 3 \\ -5 & -3 & 5 \end{pmatrix}.$
Can you claim that $AB = BA$? | [10] |
| 3. | $\begin{aligned} x + y + z &= 6 \\ 2y + 5z &= -4 \\ 2x + 5y - z &= 27 \end{aligned}$
Solve by matrix method: | [10] |
| 4. | Differentiate the expression $\frac{\sin x + \cos x}{\sin x - \cos x}$ with respect to x . | [10] |
| 5. | Find the maximum and minimum values of the function
$x^3 - 3x^2 - 9x + 27.$ | [10] |