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Department of Mathematics

Continuous Assessment – I (CA - I): October 22, 2024

Subject: Engineering Mathematics – I
Semester: I
Duration: 30 minutes
Max Marks: 10

Q.1 Solve any ONE the following: $(1 \times 6 = 6\ Marks)$

(i) Find the rank of a matrix A by reducing it to normal form, where $A = \begin{bmatrix} 2 & 3 & -1 & -1 \\ 1 & -1 & -2 & -4 \\ 3 & 1 & 3 & -2 \\ 6 & 3 & 0 & -7 \end{bmatrix}$.

(ii) Find the Eigen values and Eigen vectors of the matrix $A = \begin{bmatrix} 3 & 1 & 4 \\ 0 & 2 & 6 \\ 0 & 0 & 5 \end{bmatrix}$.

Q.2 Solve any ONE the following: $(1 \times 4 = 4\ Marks)$

(i) Use the Cayley-Hamilton theorem to find A^{-1}, if the matrix $A = \begin{bmatrix} 1 & 1 & 3 \\ 1 & 3 & -3 \\ -2 & -4 & -4 \end{bmatrix}$.

(ii) Solve the equations: $x + 3y + 2z = 0;\ 2x - y + 3z = 0;\ 3x - 5y + 4z = 0$.