

SCHOOL OF APPLIED SCIENCE & HUMANITIES

DEPARTMENT OF MATHEMATICS

Subject: Linear Algebra

Subject Code : 25MT103

Sem. : I

Academic Year: 2025-2026

Section: 21

Regulation: R25

**T5 - Assignment 4**

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1. Consider the following matrix.

$$A = \begin{bmatrix} 11 & -8 & -4 \\ -8 & -1 & -2 \\ 4 & -2 & -4 \end{bmatrix}$$

- Calculate the characteristic polynomial.
- Compute Eigenvalues of A.
- Compute Eigenvectors for all the eigenvalues of A.
- State the Cayley-Hamilton theorem and calculate the inverse of A using Cayley-Hamilton theorem.
- Check if A is diagonalizable. If so, calculate D and P matrices. If not, give the reason.
- Calculate  $A^{20}$  using the Cayley-Hamilton theorem.