KGiSL INSTITUTE OF TECHNOLOGY

DEPARTMENT OF SCIENCE AND HUMANITIES

SET A | **SLIP TEST – 1** | **24UMA161 – MATRICES AND CALCULUS ALGEBRA** | **SET B**

PART A (9 marks)	PART A (9 marks)
1. Find the characteristic equation of the matrix $\begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$.	1. Find the characteristic polynomial of the matrix $\begin{bmatrix} -1 & 3 \\ -2 & 4 \end{bmatrix}$.
2. If 3 and 5 are the two eigenvalues of $\begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$, then find $\lvert A \rvert$.	2. Two eigenvalues of the matrix $\begin{bmatrix} 2 & 2 & 1 \\ 1 & 3 & 1 \\ 1 & 2 & 2 \end{bmatrix}$ are equal to 1 each. Find the eigenvalues of A^{-1}.
3. State Cayley-Hamilton Theorem.	3. Show that the eigenvalues of a null matrix are zero.
PART B (16 marks)	**PART B (16 marks)**
4. (i) Find the eigenvalues and eigenvectors of the matrix $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 3 & -1 \\ 0 & -1 & 3 \end{bmatrix}$.	4. (i) Find the eigenvalues and eigenvectors of the matrix $\begin{bmatrix} 1 & 0 & -1 \\ 1 & 2 & 1 \\ 2 & 2 & 3 \end{bmatrix}$
(ii) If $A = \begin{bmatrix} 3 & -1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 3 \end{bmatrix}$, verify Cayley-Hamilton theorem.	(ii) I Verify Cayley-Hamilton theorem for $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & -1 & 4 \\ 3 & 1 & -1 \end{bmatrix}$