23MAT101 –MATRICES AND CALCULUS

UNIT I – MATRIX EIGEN VALUE PROBLEMS

PART A QUESTIONS

1. Find the Characteristic equation of the matrix $\begin{pmatrix} 1 & 4 \\ 2 & 3 \end{pmatrix}$

2. The product of two Eigen values of the matrix $A=\begin{bmatrix} 6 & -2 & 2 \\ -2 & 3 & -1 \\ 2 & -1 & 3 \end{bmatrix}$ *is* 16. Find the third Eigen value of A.

3. The Eigen value of the matrix $\begin{bmatrix} 11 & -4 & -7 \\ 7 & -2 & -5 \\ 10 & -4 & -6 \end{bmatrix}$ are 0 and 1. Find the other Eigen value.

4. Find the Characteristic equation of the matrix $\begin{pmatrix} 1 & 2 \\ 0 & 2 \end{pmatrix}$ and get the Eigen Values

5. If 3 and 6 are two eigenvalues of $A=\begin{pmatrix} 1 & 1 & 3 \\ 1 & 5 & 1 \\ 3 & 1 & 1 \end{pmatrix}$, write down all the eigen values of A^{-1}

6. If the sum of two eigenvalues and the trace of a 3×3 matrix A are equal, find the value of $|A|$

7. Two Eigen values of $A=\begin{bmatrix} 4 & 6 & 6 \\ 1 & 2 & 2 \\ -1 & -5 & -2 \end{bmatrix}$ are equal and they are double the third. Find the Eigen values of A^2

8. For a given matrix A of order 3, $|A| = 32$ and two of its eigenvalues are 8 and 2.

9. State Cayley – Hamilton theorem.

10. Use Cayley- Hamilton theorem to find $(A^4 - 4A^3 - 5A^2 + A + 2I)$ when $\begin{pmatrix} 1 & 2 \\ 4 & 3 \end{pmatrix}$