Assignment - (UNIT-1)

Do all the questions-

1-Define with example

(a)Orthogonal matrix

(b)Hermitian matrix

(c)Unitary matrix

(d)Symmetric matrix

(e) Triangular matrix

2-IF A =$\begin{bmatrix} 2 & 4 \\ 5 & 1 \end{bmatrix}$and B =$\begin{bmatrix} 3 & 6 \\ 8 & 7 \end{bmatrix}$ find 3A+4B.

3-Find A^2 for the given matrix A =$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 3 & 2 \\ 3 & 1 & 4 \end{bmatrix}$

4-Find the inverse of $\begin{bmatrix} 2 & 5 & 3 \\ 3 & 1 & 2 \\ 1 & 2 & 1 \end{bmatrix}$

5-Solve the system of equation using matrices

3x+2y+4z=7 , 2x+y+z=4 , x+3y+5z=2

6-Find the inverse of the following matrix using elementary transformation

$\begin{bmatrix} 1 & 3 & 3 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{bmatrix}$

7-Find the rank and nullity of the matrix $\begin{bmatrix} 1 & 2 & 3 \\ 1 & 4 & 2 \\ 2 & 6 & 5 \end{bmatrix}$

8-Test the consistency of the system of given equations and if possible find the solution

4x-2y+6z = 8 , x+y-3z = -1 , 15x-3y+9z = 21

9-Find the characteristic roots and corresponding eigen vectors for the matrix

$$\begin{bmatrix} 2 & 2 & 1 \\ 1 & 3 & 1 \\ 1 & 2 & 2 \end{bmatrix}$$

10-Verify Cayley-Hamilton Theorem for the matrix A = $\begin{bmatrix} 2 & -1 & 1 \\ 1 & 2 & 1 \\ 1 & -1 & 2 \end{bmatrix}$ and hence find A^{-1} .

11-Find the eigen values of the matrix A = $\begin{bmatrix} 0 & 1 & 2 \\ 1 & 0 & -1 \\ 2 & -1 & 0 \end{bmatrix}$

12-If A = $\begin{bmatrix} 1 & 2 & 0 \\ 3 & 1 & 5 \\ 2 & 4 & -3 \end{bmatrix}$ Find A^3+A^2+A .

13-Find transpose conjugate matrix A = $\begin{bmatrix} 1-2i & 2+3i & 3-4i \\ 4+5i & 5-6i & 6+7i \\ 8 & 7-8i & 9 \end{bmatrix}$

14-Prove (2,3,4) , (0,1,2) , (-1,1,-1) are linearly independent .

15-Reduce the matrix A = $\begin{matrix} 1 & 2 & -1 & 4 \\ 2 & 4 & 3 & 4 \\ 1 & 2 & 3 & 4 \end{matrix}$ to normal form and compute rank .

$$-1 \quad -2 \quad 6 \quad -7$$