

Assignment - 3 (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 $A = \begin{bmatrix} 1 & 2 & -1 & 4 \\ 2 & 4 & 3 & 4 \\ 1 & 2 & 3 & 4 \\ -1 & -2 & 6 & -7 \end{bmatrix}$ to normal form and compute rank.