

Class XI : ARTIFICIAL INTELLIGENCE

Instructor: Saptarshi Jana

Matrices Assignment 4

Due Date: 25.09.25

10 marks

1. Define a matrix.

2. What is the order of the matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix}$?

3. State whether the following is a scalar matrix: $\begin{bmatrix} 3 & 0 \\ 0 & 3 \end{bmatrix}$.

4. Differentiate between a square matrix and a rectangular matrix with examples.

5. Show that the addition of matrices is commutative using:

$$A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}, \quad B = \begin{bmatrix} 5 & 6 \\ 7 & 8 \end{bmatrix}$$

6. Write any two properties of matrix multiplication.

7. Identify the type of each matrix and justify your answer:

$$A = \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}, \quad B = \begin{bmatrix} 7 & 0 \\ 0 & 7 \end{bmatrix}$$

8. Add and subtract the following matrices:

$$A = \begin{bmatrix} 3 & 4 \\ 5 & 6 \end{bmatrix}, \quad B = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$$

9. Multiply the following matrices:

$$A = \begin{bmatrix} 1 & 2 \end{bmatrix}, \quad B = \begin{bmatrix} 3 \\ 4 \end{bmatrix}$$

10. Find the product of the matrices:

$$A = \begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix}, \quad B = \begin{bmatrix} 3 & 1 \\ 2 & 4 \end{bmatrix}$$

Verify if $AB \neq BA$.

11. Given matrix $A = \begin{bmatrix} 2 & 4 & 6 \\ 1 & 3 & 5 \end{bmatrix}$, find:

(a) Transpose A^T

(b) Product $A \times A^T$

12. Find the inverse of the matrix $A = \begin{bmatrix} 5 & 1 & -1 \\ 3 & 0 & 2 \\ 4 & -2 & 1 \end{bmatrix}$ using the formula $A^{-1} = \frac{1}{\det(A)} \times \text{adj}(A)$.