MATRICES

TYPES OF MATRICES

EXERCISE

Q.1 Demonstrate that the matrix $A = \begin{bmatrix} 2 & -2 & -4 \\ -1 & 3 & 4 \\ 1 & -2 & -3 \end{bmatrix}$ is idempotent.

Q.2 Demonstrate that the matrix $A = \begin{bmatrix} -5 & -8 & 0 \\ 3 & 5 & 0 \\ 1 & 2 & -1 \end{bmatrix}$ is involuntary.

Q.3 Identify the upper triangular matrix in the following.

(A) $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 2 & 0 \\ 3 & 0 & 3 \end{bmatrix}$ (B) $\begin{bmatrix} 5 & 4 & 2 \\ 0 & 0 & 3 \\ 0 & 0 & 1 \end{bmatrix}$ (C) $\begin{bmatrix} 0 & 2 & 3 \\ 0 & 0 & 4 \end{bmatrix}$ (D) $\begin{bmatrix} 2 & 1 \\ 0 & 3 \\ 0 & 0 \end{bmatrix}$

Q.4 In the following options, identify the singular matrix:

(A) $\begin{bmatrix} 2 & 3 \\ 1 & 3 \end{bmatrix}$ (B) $\begin{bmatrix} 3 & 2 \\ 2 & 3 \end{bmatrix}$ (C) $\begin{bmatrix} 1 & 2 \\ 1 & 0 \end{bmatrix}$ (D) $\begin{bmatrix} 2 & 3 \\ 4 & 6 \end{bmatrix}$

Q.5 Recognize the scalar matrix

(A) $\begin{bmatrix} -1 & 3 \\ 2 & 4 \end{bmatrix}$ (B) $\begin{bmatrix} 0 & 3 \\ 2 & 0 \end{bmatrix}$

(C) $\begin{bmatrix} 4 & 0 \\ 0 & 4 \end{bmatrix}$ (D) None of these

Q.6 For any square matrix $A = [a_{ij}]$, where $a_{ij} = 0$, when $i \neq j$, then A is-

(A) unit matrix (B) scalar matrix

(C) diagonal matrix (D) none of these

Q.7 A row matrix has only-

(A) one element

(B) one row with one or more columns

(C) one column with one or more rows

(D) one row and one column

Q.8 A matrix $A = (a_{ij})_{m \times n}$ considered a square matrix if-

(A) $m = n$ (B) $m \leq n$ (C) $m \geq n$ (D) $m < n$

Q.9 In the following options, identify the diagonal matrix

(A) $\begin{bmatrix} 0 & 3 \\ 4 & 0 \end{bmatrix}$ (B) $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 2 & 0 \end{bmatrix}$ (C) $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ (D) $\begin{bmatrix} 3 & 0 \\ 0 & 4 \end{bmatrix}$

Q.10 If matrix A has p elements in each row and q elements in each column, then the order of A is:

(A) $p \times p$ (B) $q \times q$ (C) $p \times q$ (D) $q \times p$

Q.11 Find the matrix 2A where $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 4 \\ 0 & 5 & 6 \end{bmatrix}$ is given,

(A) $\begin{bmatrix} 2 & 4 & 6 \\ 2 & 3 & 4 \\ 0 & 5 & 6 \end{bmatrix}$ (B) $\begin{bmatrix} 1 & 2 & 3 \\ 4 & 6 & 8 \\ 0 & 5 & 6 \end{bmatrix}$

(C) $\begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 4 \\ 0 & 10 & 12 \end{bmatrix}$ (D) $\begin{bmatrix} 2 & 4 & 6 \\ 4 & 6 & 8 \\ 0 & 10 & 12 \end{bmatrix}$

Q.12 Find the value of a, if $X = \begin{bmatrix} 1 & a \\ 0 & 1 \end{bmatrix}$ and $3X - \begin{bmatrix} 2 & 3 \\ 0 & 2 \end{bmatrix} = \begin{bmatrix} 1 & 3 \\ 0 & 1 \end{bmatrix}$, is given.

(A) –2 (B) 0 (C) 2 (D) 1

ANSWER KEY

3. (B)

4. (D)

5. (C)

6. (C)

7. (B)

8. (A)

9. (D)

10. (D)

11. (D)

12. (C)