MATRICES

SYMMETRIC AND SKEW SYMMETRIC

EXERCISE

Q.1 Demonstrate that if A is non-singular matrix and A is symmetric then A^{-1} is also symmetric.

Q.2 Matrix $\begin{bmatrix} 0 & 5 & -7 \\ -5 & 0 & 11 \\ 7 & -11 & 0 \end{bmatrix}$ is a-

(A) diagonal matrix   (B) upper triangular matrix

(C) skew-symmetric matrix   (D) symmetric matrix

Q.3 If A and B are square matrices of same order, which of the following is skew-symmetric-

(A) $\dfrac{A + A^{T}}{2}$ (B) $\dfrac{A^{T} + B^{T}}{2}$ (C) $\dfrac{A^{T} - B^{T}}{2}$ (D) $\dfrac{B - B^{T}}{2}$

Q.4 If A is both a symmetric and skew symmetric matrix, then -

(A) A is a diagonal matrix   (B) A is a null matrix

(C) A is a unit matrix   (D) A is a triangular matrix

Q.5 If A – A′ = 0, then A′ is -

(A) orthogonal matrix   (B) symmetric matrix

(C) skew- symmetric matrix   (D) triangular matrix

Q.6 If matrix $\begin{bmatrix} x & y \\ u & v \end{bmatrix}$ is symmetric, then -

(A) x + v = 0   (B) x – v = 0   (C) y + u = 0   (D) y – u = 0

Q.7 If A is symmetric matrix and B is a skew- symmetric matrix, determine the incorrect statement for $n \in N$.

(A) A^n is symmetric

(B) A^n is symmetric only when n is even

(C) B^n is skew symmetric when n is odd

(D) B^n is symmetric when n is even

Q.8 If A is a square matrix, then $A - A'$ is -

(A) unit matrix   (B) null matrix

(C) A   (D) a skew symmetric matrix

Q.9 Consider a square matrix denoted by A. Identify which of the options is not a symmetric matrix.

(A) $A + A'$ (B) AA' (C) $A'A$ (D) $A - A'$

ANSWER KEY

2.   (C)

3.   (D)

4.   (B)

5.   (B)

6.   (D)

7.   (B)

8.   (D)

9.   (D)