DETERMINANTS

ADJOINT AND INVERSE OF A MATRIX

EXERCISE

Q.1 Which of the following represents the adjoint of the matrix $A = \begin{bmatrix} 1 & 5 \\ 3 & 4 \end{bmatrix}$?

(a) $\begin{bmatrix} 4 & -5 \\ -3 & -1 \end{bmatrix}$ (b) $\begin{bmatrix} -4 & 5 \\ -3 & 1 \end{bmatrix}$ (c) $\begin{bmatrix} 4 & -5 \\ -3 & 1 \end{bmatrix}$ (d) $\begin{bmatrix} 4 & 5 \\ -3 & 1 \end{bmatrix}$

Q.2 If $A = \begin{bmatrix} 5 & -8 \\ 2 & 6 \end{bmatrix}$ determine A (adj A).

(a) $\begin{bmatrix} 41 & 0 \\ 0 & 46 \end{bmatrix}$ (b) $\begin{bmatrix} 46 & 0 \\ 1 & 46 \end{bmatrix}$ (c) $\begin{bmatrix} 46 & 1 \\ 0 & 46 \end{bmatrix}$ (d) $\begin{bmatrix} 46 & 0 \\ 0 & 46 \end{bmatrix}$

Q.3 If $A = \begin{bmatrix} 1 & 0 \\ 9 & 4 \end{bmatrix}$ then (adj A) A is

(a) $\begin{bmatrix} -4 & 0 \\ 0 & -4 \end{bmatrix}$ (b) $\begin{bmatrix} 4 & 0 \\ 1 & 4 \end{bmatrix}$ (c) $\begin{bmatrix} 4 & 0 \\ 0 & 4 \end{bmatrix}$ (d) $\begin{bmatrix} 4 & 0 \\ 0 & -4 \end{bmatrix}$

Q.4 What is the formula used to compute the inverse of the matrix among the following options?

(a) $\frac{2}{|A|}\text{adj}A$ (b) $\frac{1}{|A|}\text{adj}A$ (c) $\frac{-1}{|A|}\text{adj}A$ (d) $\frac{1}{|2A|}\text{adj}A$

Q.5 Determine the inverse of the matrix $A = \begin{bmatrix} 8 & 5 \\ 4 & 1 \end{bmatrix}$

(a) $\begin{bmatrix} -\frac{1}{12} & \frac{5}{12} \\ \frac{1}{3} & -\frac{2}{3} \end{bmatrix}$ (b) $\begin{bmatrix} \frac{1}{12} & \frac{5}{12} \\ \frac{1}{3} & -\frac{2}{3} \end{bmatrix}$

(c) $\begin{bmatrix} -\frac{1}{12} & \frac{5}{12} \\ \frac{1}{3} & \frac{2}{3} \end{bmatrix}$ (d) $\begin{bmatrix} -\frac{1}{12} & \frac{5}{12} \\ -\frac{1}{3} & -\frac{2}{3} \end{bmatrix}$

Q.6 Which of the following conditions is not accurate for the inverse of matrix A?

(a) The matrix A must be a square matrix

(b) A must be singular matrix

(c) A must be a non-singular matrix

(d) adj A≠0

Q.7 Among the provided matrices, which one possesses an inverse $\frac{1}{-6}\begin{bmatrix} 2 & 1 \\ 0 & -3 \end{bmatrix}$?

(a) $\begin{bmatrix} 3 & -1 \\ 0 & 2 \end{bmatrix}$ (b) $\begin{bmatrix} -3 & -1 \\ 0 & 2 \end{bmatrix}$ (c) $\begin{bmatrix} -2 & 0 \\ 1 & 3 \end{bmatrix}$ (d) $\begin{bmatrix} -3 & -1 \\ 0 & -2 \end{bmatrix}$

Q.8 If the matrices $A = \begin{bmatrix} -8 & 2 \\ 6 & -3 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 1 \\ 1 & 7 \end{bmatrix}$ given then find the $(AB)^{-1}$

(a) $-\frac{1}{432}\begin{bmatrix} -27 & 6 \\ 9 & 14 \end{bmatrix}$ (b) $\frac{1}{432}\begin{bmatrix} 27 & 6 \\ 9 & 14 \end{bmatrix}$

(c) $\frac{1}{432}\begin{bmatrix} -27 & 6 \\ 9 & 14 \end{bmatrix}$ (d) $\frac{-1}{432}\begin{bmatrix} 27 & 6 \\ 9 & 14 \end{bmatrix}$

Q.9 Which of the following formula is not accurate?

(a) A(adj A)=|A|I

(b) |adj (A)|=$|A|^{n-1}$, for an n^{th} order matrix

(c) $A^{-1}=\frac{1}{|A|}$ adj A

(d) A(adj A)=$|A|^{n-1}$

Q.10 A square matrix A is considered non-singular if the determinant $|A| \neq 0$

(a) True (b) False

ANSWER KEY

1. (C)

2. (D)

3. (C)

4. (B)

5. (A)

6. (B)

7. (B)

8. (C)

9. (D)

10. (A)