# DETERMINANTS

## ADJOINT AND INVERSE OF A MATRIX

## EXERCISE

**Q.1** Which of the following is 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 , $A=\begin{bmatrix}5 & -8\\ 2 & 6\end{bmatrix}$ Find 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** Which of the following is the formula for calculating the inverse of the matrix?

(a) $\frac{2}{|A|}adjA$ (b) $\frac{1}{|A|}adjA$

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

**Q.5** Find 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 below condition is incorrect for the inverse of a 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** Which of the below given matrices has the 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 $A=\begin{bmatrix}-8 & 2\\ 6 & -3\end{bmatrix}$ and $B=\begin{bmatrix}2 & 1\\ 1 & 7\end{bmatrix}$. Find $(AB)^{-1}$.

(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 incorrect?

(a) $A(\text{adj } A)=|A|I$

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

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

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

**Q.10** A square matrix A is said to be non-singular if $|A|\neq 0$.

(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)