JEE	Class – 12th	Topic – Adjoint and Inverse of a Matrix

1. If $A = \begin{bmatrix} 2 & -3 \\ -4 & 1 \end{bmatrix}$ then adj $100(3A^2 + 12A)$ is equal to:

   (A) $\begin{bmatrix} 51 & 63 \\ 84 & 72 \end{bmatrix}$ (B) $\begin{bmatrix} 51 & 84 \\ 63 & 72 \end{bmatrix}$

   (C) $\begin{bmatrix} 72 & -63 \\ -84 & 51 \end{bmatrix}$ (D) $\begin{bmatrix} 72 & -84 \\ -63 & 51 \end{bmatrix}$

2. Let $A = \begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix}$ and $B = I + adj(A) + (adjA)^2 + \cdots + (adjA)^{10}$. Then, the sum of all the elements of the matrix B is :

   (A) -110 (B) 22

   (C) -88 (D) -124

3. A is a symmetric matrix such that $|A| = 4$ of order 3 . Then find the value $|(AdjA)'|$ is

   (A) 8 (B) 16

   (C) 64 (D) 2

4. If A is a square matrix of order 4 , and $|A| = 4$ then $|(adjA^{-1})^{-1}|$ is

   (A) 16 (B) 32

   (C) 48 (D) 64

5. If $|A| = 2$, then $|A \text{ adj } (A^{-1})|$ is equal to (Given that order of A is 3×3)

   (A) $\frac{1}{2}$ (B) 1

   (C) 2 (D) 4

6. Which of the option is incorrect . $|A| \neq 0$

   (A) $A(adjA) = |A|I_n$

   (B) $adj(adjA) = |A|^{n-2}A$

   (C) $adj(ABC) = (adjB)(adjC)(adjA)$

   (D) both A and B

7. If A is a square matrix of order 3 , such that $A(adjA) = 10\,I$, then $|adjA|$ is equal to

(A) 1 (B) 10

(C) 100 (D) 101

8. Let $x, y, z > 1$ and

$$A = \begin{bmatrix} 1 & \log_x y & \log_x z \\ \log_y x & 2 & \log_y z \\ \log_z x & \log_z y & 3 \end{bmatrix}.$$

Then $|adj(adjA^2)|$ is equal to

(A) 6^4 (B) 2^8

(C) 4^8 (D) 2^4

9. If $A = \begin{bmatrix} x & 2 \\ 4 & 3 \end{bmatrix}$ and $A^{-1} = \begin{bmatrix} \frac{1}{8} & \frac{-1}{12} \\ \frac{-1}{6} & \frac{4}{9} \end{bmatrix}$, then find the value of x ?

(A) $\frac{28}{3}$ (B) $\frac{32}{3}$

(C) $\frac{34}{3}$ (D) 10

10. If $A^{-1} = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 3 \\ 3 & 1 & 6 \end{bmatrix} = \frac{adj(A)}{k}$, then $k = ?$

(A) -25 (B) -15

(C) $-\frac{1}{15}$ (D) None of the above

11. Let $A = \begin{bmatrix} 3 & -3 & 4 \\ 2 & -3 & 4 \\ 0 & -1 & 1 \end{bmatrix}$

What is A^{-1} equal to?

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

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

12. Let $A = \begin{bmatrix} 3 & -3 & 4 \\ 2 & -3 & 4 \\ 0 & -1 & 1 \end{bmatrix}$

What is A(adjA) equal to?

(A) $\begin{bmatrix} 5 & 0 & 0 \\ 0 & 5 & 0 \\ 0 & 0 & 5 \end{bmatrix}$

(B) $\begin{bmatrix} 1/2 & 0 & 0 \\ 0 & 1/2 & 0 \\ 0 & 0 & 1/2 \end{bmatrix}$

(C) $\begin{bmatrix} 2 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 2 \end{bmatrix}$

(D) $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$