

MCQ $1 \times 6 = 6$ (1) If A and B are square matrix of the same order then $(AB)'$ is

- (a)
- $A'B'$
- (b)
- AB
- (c)
- $B'A'$
- (d) None

(2) If $\begin{bmatrix} x+2y & -y \\ 3x & 4 \end{bmatrix} = \begin{bmatrix} -4 & 3 \\ 6 & 4 \end{bmatrix}$, the values of x and y are

- (a)
- $x=-3, y=2$
- (b)
- $x=2, y=-3$
- (c)
- $x=2, y=3$
- (d)
- $x=3, y=-2$

(3) If $A = \begin{bmatrix} 2 & 5 \\ 1 & 3 \end{bmatrix}$ then $\text{Adj } A = ?$

- (a)
- $\begin{bmatrix} 3 & -5 \\ -1 & 2 \end{bmatrix}$
- (b)
- $\begin{bmatrix} 3 & -1 \\ -5 & 2 \end{bmatrix}$
- (c)
- $\begin{bmatrix} -1 & 2 \\ 3 & -5 \end{bmatrix}$
- (d) None

(4) If $A = \begin{bmatrix} 1 & \lambda & 2 \\ 1 & 2 & 5 \\ 2 & 1 & 1 \end{bmatrix}$ is not invertible then $\lambda =$

- (a) 2 (b) 1 (c) -1 (d) 0

(5) If A is a square matrix then $(A + A')$ is

- (a) a null matrix (b) an identity matrix
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- (c) a symmetric matrix (d) a skew-symmetric matrix

(6) $\begin{vmatrix} \cos 65^\circ & \sin 65^\circ \\ \sin 25^\circ & \cos 25^\circ \end{vmatrix}$ is

- (a) 1 (b) 0 (c)
- $-\frac{1}{2}$
- (d)
- $\frac{1}{2}$

Short-answer type question ($2 \times 7 = 14$)

(1) If ω is complex cube root of unity prove that

$$\begin{vmatrix} 1 & \omega & \omega^2 \\ \omega & \omega^2 & 1 \\ \omega^2 & 1 & \omega \end{vmatrix} = 0$$

(2) Find the values of x, y, z from the equation

$$\begin{bmatrix} x+y+z \\ x+z \\ y+z \end{bmatrix} = \begin{bmatrix} 9 \\ 5 \\ 7 \end{bmatrix}$$

(3) Using elementary transformation find the inverse of $A = \begin{bmatrix} 2 & 1 \\ 1 & 1 \end{bmatrix}$

(4) Without expanding prove that $\begin{vmatrix} x+y & y+z & z+x \\ z & x & y \\ 1 & 1 & 1 \end{vmatrix} = 0$

(5) Find the Adjoint of the matrix $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$.

(6) If $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$, show that $A^2 - 5A + 7I = 0$

(7) Evaluate the determinant $\begin{vmatrix} 3 & -4 & 5 \\ 1 & 1 & -2 \\ 2 & 3 & 1 \end{vmatrix}$.