CBSE TEST PAPER-05

CLASS - XII MATHEMATICS

CH-03 Matrices

1. Given an example of matrix A and B such that AB = 0 but A ≠ 0, B ≠ 0   [1]

2. Show that $A = \begin{bmatrix} 0 & 1 & -1 \\ -1 & 0 & 1 \\ 1 & -1 & 0 \end{bmatrix}$, is skew symmetric matrix.   [2]

3. $A = \begin{bmatrix} 2 & 4 \\ 5 & 6 \end{bmatrix}$, Prove that $A + A'$ is a symmetric matrix   [2]

4. If $A = \begin{bmatrix} -1 & 5 \\ 3 & 2 \end{bmatrix}$ show that $(3A)' = 3A'$ [2]

5. Solve for x and y, given that $\begin{bmatrix} x & y \\ 3y & x \end{bmatrix}\begin{bmatrix} 1 \\ 2 \end{bmatrix} = \begin{bmatrix} 3 \\ 5 \end{bmatrix}$ [2]

6. If $A = \begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$ then prove that $A^n = \begin{bmatrix} \cos n\theta & \sin n\theta \\ -\sin n\theta & \cos n\theta \end{bmatrix}$ [4]

7. $A = \begin{bmatrix} 4 & 3 \\ 2 & 5 \end{bmatrix}$, find x and y such that $A^2 - xA + yI = 0$ [4]

8. If $A = \begin{bmatrix} \cos^2\alpha & \cos\alpha\sin\alpha \\ \cos\alpha\sin\alpha & \sin^2\alpha \end{bmatrix}$, $B = \begin{bmatrix} \cos^2\beta & \cos\beta\sin\beta \\ \cos\beta\sin\beta & \sin^2\beta \end{bmatrix}$

    Show that AB is a zero matrix if α and β differ by an odd multiple of $\dfrac{\pi}{2}$.   [4]

    Find the condition for which AB=0

9. If f(x) = x² – 5x + 7   and $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$ find f(A)   [4]

10. Find X and Y, if 2x + 3y = $\begin{bmatrix} 2 & 3 \\ 4 & 0 \end{bmatrix}$ and $3x + 2y = \begin{bmatrix} 2 & -2 \\ -1 & 5 \end{bmatrix}$ [6]