

XII MATHS TEST ON MATRICES

M.M. : 30

TIME : 1 HR.

- Let P & Q be two different matrices of order $3 \times n$ and $n \times p$ then what is the order of the matrix $4Q - P$, if it is defined. 1
- Find the additive inverse of matrix $\begin{bmatrix} 2 & 1 \\ -3 & 0 \end{bmatrix}$. 1
- If A is a square matrix such that $A^2 = A$, then write the value of $7A - (I + A)^3$, where I is an identity matrix. 2
- For what values of x and y are the following matrices equal $A = \begin{bmatrix} 2x+1 & 2y \\ 0 & y^2 - 5y \end{bmatrix}, B = \begin{bmatrix} x+3 & y^2 + 2 \\ 0 & -6 \end{bmatrix}$. 2
- If $M \begin{bmatrix} 1 & 1 \\ 1 & 2 \end{bmatrix} = \begin{bmatrix} 1 & 1 \end{bmatrix}$, find matrix M. 2
- Let A and B be symmetric matrices of the same order. Then, show that $AB - BA$ is a skew - symmetric matrix 2
- Uniquely express the given matrices as sum of symmetric and skew - symmetric matrices $\begin{bmatrix} -4 & -3 \\ -1 & 4 \end{bmatrix}$ 2
- If $A = \begin{bmatrix} 1 & -1 \\ 2 & -1 \end{bmatrix}, B = \begin{bmatrix} a & 1 \\ b & -1 \end{bmatrix}$ and $(A + B)^2 = A^2 + B^2$, find 'a' and 'b'. 4
- If $A = \begin{bmatrix} 1 & 0 & 2 \\ 0 & 2 & 1 \\ 2 & 0 & 3 \end{bmatrix}$ then find whether A is a root of the polynomial $f(x) = x^3 - 6x^2 + 7x + 2$. 4
- Let $A = \begin{bmatrix} 0 & -\tan(\alpha/2) \\ \tan(\alpha/2) & 0 \end{bmatrix}$ and I be the identity matrix of order 2. Show that $I + A = (I - A) \begin{bmatrix} \cos\alpha & -\sin\alpha \\ \sin\alpha & \cos\alpha \end{bmatrix}$ 4
- Solve : $\begin{bmatrix} x & -5 & -1 \end{bmatrix} \begin{bmatrix} 1 & 0 & 2 \\ 0 & 2 & 1 \\ 2 & 0 & 3 \end{bmatrix} \begin{bmatrix} x \\ 4 \\ 1 \end{bmatrix} = O$ 4