Matrices

1. Find the values of x, y and z from the equation $\begin{bmatrix} x+y & 2 \\ 5+z & xy \end{bmatrix} = \begin{bmatrix} 6 & 2 \\ 5 & 8 \end{bmatrix}$. **(MQP 1)**

2. Find the value of x and y in $\begin{bmatrix} x+2y & 2 \\ 4 & x+y \end{bmatrix} - \begin{bmatrix} 3 & 2 \\ 4 & 1 \end{bmatrix} = O$, where O is null matrix. **(MQP 4)**

3. Find the value of x and y, if $\begin{bmatrix} x+y & 3 \\ x-y & -6 \end{bmatrix} = \begin{bmatrix} 2 & 3 \\ 4 & -6 \end{bmatrix}$. **(MQP 5)**

4. Find the values of x and y from the equation $2\begin{bmatrix} x & 5 \\ 7 & y-3 \end{bmatrix} + \begin{bmatrix} 3 & -4 \\ 1 & 2 \end{bmatrix} = \begin{bmatrix} 7 & 6 \\ 15 & 14 \end{bmatrix}$.

5. Find X and Y, if $X+Y = \begin{bmatrix} 5 & 2 \\ 0 & 9 \end{bmatrix}$ and $X-Y = \begin{bmatrix} 3 & 6 \\ 0 & -1 \end{bmatrix}$.

6. Find X and Y, if $X+Y = \begin{bmatrix} 7 & 0 \\ 2 & 5 \end{bmatrix}$ and $X-Y = \begin{bmatrix} 3 & 0 \\ 0 & 3 \end{bmatrix}$.

7. If $F(x)=\begin{bmatrix}\cos x & -\sin x & 0\\ \sin x & \cos x & 0\\ 0 & 0 & 1\end{bmatrix}$. Show that $F(x).F(y)=F(x+y)$. **(M 20)**

8. For any square matrix A with real number entries, prove that $A+A'$ is a symmetric matrix and $A-A'$ is a skew symmetric matrix. **(J 14)**

9. If A and B are invertible matrices of the same order, then prove that $(AB)^{-1}=B^{-1}\cdot A^{-1}$.

(M 15)

10. If A and B are symmetric matrices of the same order, then show that AB is symmetric if and only if $AB = BA$. **(M 17)**

11. If $A'=\begin{bmatrix}3 & 4\\ -1 & 2\\ 0 & 1\end{bmatrix}$ and $B=\begin{bmatrix}-1 & 2 & 1\\ 1 & 2 & 3\end{bmatrix}$, then verify that $(A+B)'=A'+B'$.

12. For the matrix $A=\begin{bmatrix}1 & 5\\ 6 & 7\end{bmatrix}$, verify that $A+A'$ is a symmetric matrix and $A-A'$ is a skew symmetric matrix. **(A 21)**

13. Express the matrix $\begin{bmatrix}3 & 5\\ 1 & -1\end{bmatrix}$ as sum of a symmetric and a skew symmetric matrix. **(J 15)**

14. Express the matrix $\begin{bmatrix}1 & 2\\ 2 & -1\end{bmatrix}$ as the sum of a symmetric and a skew symmetric matrix.

(MQP 2) (J 17)

15. Express the matrix $\begin{bmatrix}1 & 5\\ -1 & 2\end{bmatrix}$ as the sum of a symmetric and a skew symmetric matrix.