

Q.5 If the matrix  $\begin{bmatrix} 0 & a & 3 \\ 2 & b & -1 \\ c & 1 & 0 \end{bmatrix}$  is a skew-symmetric

matrix, find the values of  $a$ ,  $b$  and  $c$ .

Sol. Let  $A = \begin{bmatrix} 0 & a & 3 \\ 2 & b & -1 \\ c & 1 & 0 \end{bmatrix}$ .

Since,  $A$  is skew symmetric matrix

$$\therefore A' = -A$$

$$\Rightarrow \begin{bmatrix} 0 & 2 & c \\ a & b & 1 \\ 3 & -1 & 0 \end{bmatrix} = - \begin{bmatrix} 0 & 0 & 3 \\ 2 & b & -1 \\ c & 1 & 0 \end{bmatrix}$$

$$\Rightarrow \begin{bmatrix} 0 & 2 & c \\ a & b & 1 \\ 3 & -1 & 0 \end{bmatrix} = \begin{bmatrix} 0 & -a & -3 \\ -2 & -b & 1 \\ -c & -1 & 0 \end{bmatrix}$$

By equality of matrices, we get

$$a = -2, c = -3 \text{ and } b = -b \Rightarrow b = 0$$

$$\therefore a = -2, b = 0 \text{ and } c = -3$$