If the matrix $A = \begin{bmatrix} 0 & a & -3 \\ 2 & 0 & -1 \\ b & 1 & 0 \end{bmatrix}$ is skew-symmetric, then

Solution :

Given : $A = \begin{bmatrix} 0 & a & -3 \\ 2 & 0 & -1 \\ b & 1 & 0 \end{bmatrix}$ is skew-symmetric

$$A^T = \begin{bmatrix} 0 & 2 & b \\ a & 0 & 1 \\ -3 & -1 & 0 \end{bmatrix}$$

We know that A is skew symmetric if $A = -A^T$

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

$a = -2$

$\Rightarrow -3 = -b$

$\therefore b = 3$

A $a = -2$

B $a = 2$

C $b = 3$

D $b = -3$

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