Q. 33 If $A = \begin{vmatrix} 2 & \lambda & -3 \\ 0 & 2 & 5 \\ 1 & 1 & 3 \end{vmatrix}$, then A^{-1} exists, if

(a) $\lambda = 2$

(b) $\lambda \neq 2$

(c) $\lambda \neq -2$

(d) None of these

Sol. *(d)* We have,

$$A = \begin{vmatrix} 2 & \lambda & -3 \\ 0 & 2 & 5 \\ 1 & 1 & 3 \end{vmatrix}$$

Expanding along R_1,

$$|A| = 2(6-5) - \lambda(-5) - 3(-2) = 2 + 5\lambda + 6$$

We know that, A^{-1} exists, if A is non-singular matrix *i.e.*, $|A| \neq 0$.

$\therefore \quad 2 + 5\lambda + 6 \neq 0$

$\Rightarrow \quad 5\lambda \neq -8$

$\therefore \quad \lambda \neq \frac{-8}{5}$

So, A^{-1} exists if and only if $\lambda \neq \frac{-8}{5}$.