# Matrices and Determinants - Class XII

## Related Questions with Solutions

## Questions

### Quetion: 01

Which of the following values of $\alpha$ satisfy the equation

$$\begin{vmatrix} (1+\alpha)^2 & (1+2\alpha)^2 & (1+3\alpha)^2 \\ (2+\alpha)^2 & (2+2\alpha)^2 & (2+3\alpha)^2 \\ (3+\alpha)^2 & (3+2\alpha)^2 & (3+3\alpha)^2 \end{vmatrix} = -648\alpha\,?$$

A. -4
B. 9
C. -9
D. 4

## Solutions

### Solution: 01

$$\begin{vmatrix} (1+\alpha)^2 & (1+2\alpha)^2 & (1+3\alpha)^2 \\ (2+\alpha)^2 & (2+2\alpha)^2 & (2+3\alpha)^2 \\ (3+\alpha)^2 & (3+2\alpha)^2 & (3+3\alpha)^2 \end{vmatrix} \quad \begin{matrix} R_2 \to R_2 - R_1 \\ R_3 \to R_3 - R_1 \end{matrix} \text{[Take common]}$$

$$2\begin{vmatrix} (1+\alpha)^2 & (1+2\alpha)^2 & (1+3\alpha)^2 \\ 3+2\alpha & (3+4\alpha) & (3+6\alpha) \\ (4+2\alpha) & (4+4\alpha) & (4+6\alpha) \end{vmatrix}$$

$R_3 \to R_3 - R_2$

$$2\begin{vmatrix} (1+\alpha)^2 & (1+2\alpha)^2 & (1+3\alpha)^2 \\ 3+2\alpha & 3+4\alpha & 3+6\alpha \\ 1 & 1 & 1 \end{vmatrix} \quad \begin{matrix} C_2 \to C_2 - C_1 \\ C_3 \to C_3 - C_1 \end{matrix} \text{[Take common]}$$

$$\therefore \quad 2\alpha 2 \cdot \alpha \begin{vmatrix} (1+\alpha)^2 & (2+3\alpha) & (2+4\alpha) \\ 3+2\alpha & 2 & 2 \\ 1 & 0 & 0 \end{vmatrix}$$

$4\alpha^2|-2\alpha| = -8\alpha^3 = -648\alpha$

$\alpha = 0, \alpha^2 = 81, \alpha = \pm 9$

## Correct Options

Answer:01

Correct Options: B, C