

**Question 2:** Two lines  $L_1: x = 5, y/(3-\alpha) = z/-2$  and  $L_2: x = \alpha, y/-1 = z/(2-\alpha)$  are coplanar. Then  $\alpha$  can take values

- (a) 1
- (b) 2
- (c) 3
- (d) 4

**Solution:**

Given lines  $L_1: x = 5, y/(3-\alpha) = z/-2$  and

$L_2: x = \alpha, y/-1 = z/(2-\alpha)$

$L_1$  and  $L_2$  are coplanar.

So

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

$$\Rightarrow (5-\alpha)(3-\alpha)(2-\alpha) - 2 = 0$$

$$\Rightarrow (5-\alpha)(6 - 3\alpha - 2\alpha + \alpha^2 - 2) = 0$$

$$\Rightarrow (5-\alpha)(\alpha-1)(\alpha-4) = 0$$

$$\Rightarrow \alpha = 1, 4, 5$$

Hence option a and d is the answer.