

If equation of the plane through the straight line  $\frac{x-1}{2} = \frac{y+2}{-3} = \frac{z}{6}$  and perpendicular to the plane

$x - y + z + 2 = 0$  is  $ax - by + cz + 4 = 0$ , then find the value of  $a + b + c$

Ans  $\frac{x-1}{2} = \frac{y+2}{-3} = \frac{z}{5}$   $[D.R_1 = (2, -3, 5)]$

$$x - y + z + 2 = 0$$

$$D.R_2 = (1, -1, 1)$$

$\therefore$  D.R of plane required is

$$DR_1 \times DR_2 = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 2 & -3 & 5 \\ 1 & -1 & 1 \end{vmatrix}$$
$$= \hat{i}(2) - \hat{j}(-3) + \hat{k}(1)$$

$$= (2, 3, 1)$$

$$\therefore \text{eqn} \Rightarrow 2(x-1) + 3(y+2) + 1(z) = 0$$

$$2x + 3y + z + 4 = 0$$

$$\therefore a=2, b=3, c=1 \quad \boxed{ax+by+cz=0}$$