Sye points A (1,0,1) & B(3,1,2)

equation of a line joining the origin (0,0,0) to the points C (1,-1,2)

The equation of a line joining two points (x_1, y_1, z_1) & (x_2, y_2, z_2) is

$$\frac{x-x_1}{x_2-x_1} = \frac{y-y_1}{y_2-y_1} = \frac{z-z_1}{z_2-z_1} \Rightarrow \frac{x-0}{1} = \frac{y-0}{-1} = \frac{z-0}{2-0}$$

$$\Rightarrow \frac{x}{1} = \frac{y}{-1} = \frac{z}{2} \quad \text{—} (1)$$

let the equation of the plane $ax+by+cz+d=0$

equation of the plane passing through (1,0,1)

$$a(x-1) + b(y-0) + c(z-1) = 0 \quad \text{—} \cancel{(2)} \text{—} (1A)$$

$$ax + by + cz - a - c = 0 \quad \text{—} (2)$$

now ∵ equation (2) also passing through points B (3,1,2)

so

$$3a + b + 2c - a - c = 0$$

$$2a + b + c = 0 \quad \text{—} (3)$$

$$a \cdot 1 + b(-1) + c(2) = 0$$

$$\Rightarrow \quad a - b + 2c = 0 \quad \text{—} (4)$$

now solve eqn (3) & (4) by cross multiplication method

$2a + b + c = 0$

$a - b + 2c = 0$

$$\frac{a}{2+1} = \frac{-b}{4-1} = \frac{c}{-3} = \lambda$$

$a = 3\lambda$; $b = -3\lambda$; $c = -3\lambda$ } — (5)

put equation (5) in eqn (4) A the

$$3\lambda(x-1) + (-3\lambda)(y-0) + (-3\lambda)(z-1) = 0$$

$$\lambda[3x - 3 - 3y - 3z + 3] = 0$$

$$3x - 3y - 3z = 0$$

or $\boxed{x - y - z = 0}$ ——— Ans