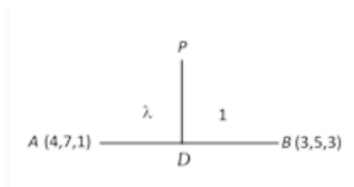**Question** : The co-ordinates of the foot of perpendicular drawn from point P (1, 0, 3) to the line joining the points A (4, 7, 1) and B (3, 5, 3) is _____.

Solution:

Let D be the foot of perpendicular drawn from P (1, 0, 3) on the line AB joining (4, 7, 1) and (3, 5, 3).

If D divides AB in ratio λ : 1, then

$$D = [(\tfrac{3\lambda+4}{\lambda+1}), (\tfrac{5\lambda+7}{\lambda+1}), (\tfrac{3\lambda+1}{\lambda+1})]$$
.....(i)

Direction ratios of PD are 2λ + 3, 5λ + 7, −2.

Direction ratios of AB are −1, −2, 2 [Because PD⊥AB]

− (2λ + 3) −2 (5λ + 7) − 4 = 0

λ = −7 / 4

Putting the value of λ in (i), we get the point D (5/3, 7/3, 17/3).