Question :

If the foot of perpendicular drawn from the point (1, 0, 3) on a line passing through (α, 7, 1) is (5/3, 7/3, 17/3), then What will be the value of α.

Solution:

Let us assume P(1, 0, 3) and Q(5/3, 7/3, 17/3) are given points.

Direction ratios of line L is:

(α – 5/3, 7 – 7/3, 1 – 17/3) = ((3α – 5)/3, 14/3, -14/3)

Direction ratios of PQ: (-2/3, -7/3, -8/3)

As line L is perpendicular to PQ so,

=> -6α +10 – 98 + 112 = 0

=> 6α = 24

=> α = 4

so, the value of α is 4.