

Question 6: The distance of the point (1, -2, 3) from the plane $x-y+z = 5$ measured parallel to the line $(x/2) = (y/3) = (z/-6)$ is:

(a) $1/7$

(b) 7

(c) $7/5$

(d) 1

Solution:

Equation of line through (1,-2,3) whose d.r.s. are (2, 3, -6)

$$(x-1)/2 = (y+2)/3 = (z-3)/-6 = \lambda$$

Any point on the line $(2\lambda+1, 3\lambda-2, -6\lambda+3)$

Substitute in equation of plane

$$x-y+z = 5$$

$$2\lambda+1-3\lambda+2-6\lambda+3 = 5$$

$$-7\lambda = -1$$

$$\lambda = 1/7$$

$$\text{Distance} = \sqrt{(2\lambda)^2+(3\lambda)^2+(6\lambda)^2}$$

$$= \sqrt{4\lambda^2+9\lambda^2+36\lambda^2}$$

$$= 7\lambda$$

$$= 1$$

Hence option d is the answer.