

15. The distance between the line $\vec{r} = 2\hat{i} - 2\hat{j} + 3\hat{k} + \lambda(\hat{i} - \hat{j} + 4\hat{k})$ and the plane $\vec{r} \cdot (\hat{i} + 5\hat{j} + \hat{k}) = 5$ is

A. $10/9$

B. $\frac{10}{3\sqrt{3}}$

C. $3/10$

D. $10/3$

B. $\frac{10}{3\sqrt{3}}$

Distance between the line

$\vec{r} = 2\hat{i} - 2\hat{j} + 3\hat{k} + \lambda(\hat{i} - \hat{j} + 4\hat{k})$ and the plane $\vec{r} \cdot (\hat{i} + 5\hat{j} + \hat{k}) = 5$

equation of plane is $x + 5y + z = 5 \therefore$ Distance of line from this plane = perpendicular distance of point $(2, -2, 3)$ from the plane

i.e $\left| \frac{2 - 10 + 3 - 5}{\sqrt{1 + 5^2 + 1}} \right| = \frac{10}{3\sqrt{3}}$