Related Questions with Solutions

Questions

Quetion: 01

A straight line is given by $\vec{r} = (1+t)\hat{i} + 3t\hat{j} + (1-t)\hat{k}$ where $t \in R$. If this line lies in the plane x + y + cz = d then the value of (c + d) is

A. 1

B. 1

C. 7

D. 9

Solutions

Solution: 01

$\vec{r} = (1+t)\hat{i} + 3t\hat{j} + (1-t)\hat{k}$

$\vec{r} : \frac{x-1}{1} = \frac{y-0}{3} = \frac{z-1}{-1}$

point [1, 0, 1] lies on line will also lie on plane

x + y + cz = d

1 + 0 + c = d ⇒ d = c + 1

also,

$\overrightarrow{n} = \hat{i} + \hat{j} + ck$

D.R. of line $\hat{i} + 3\hat{j} - \hat{k}$

$(\hat{i} + \hat{j} + c\hat{k}) \cdot (\hat{i} + 3\hat{j} - \hat{k}) = 0$

1 + 3 – c = 0

c = 4

d = 4 + 1 = 5

c + d = 9

Correct Options

Answer:01

Correct Options: D