4.5.8

EE25BTECH11006 - ADUDOTLA SRIVIDYA

Question: The value of λ for which the vectors $3i - 6j + k$ and $2i - 4j + \lambda k$ are parallel is

a) $2/3$ b) $3/2$ c) $5/2$ d) $2/5$

Solution:

Given,

$$\begin{pmatrix} 2 \\ -4 \\ \lambda \end{pmatrix} \text{ is parallel to } \begin{pmatrix} 3 \\ -6 \\ 1 \end{pmatrix} \tag{1}$$

$$\implies \begin{pmatrix} 2 \\ -4 \\ \lambda \end{pmatrix} = t \begin{pmatrix} 3 \\ -6 \\ 1 \end{pmatrix} \tag{2}$$

$$\implies 2 = 3t \quad -4 = -6t \quad \lambda = t \tag{3}$$

$$\implies t = \frac{2}{3} \tag{4}$$
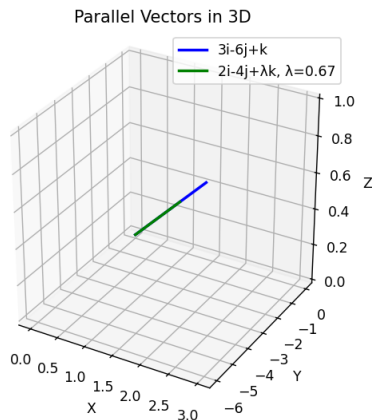
therefore,

$$\lambda = \frac{2}{3} \tag{5}$$

Fig. 0: Vectors $3i - 6j + k$ and $2i - 4j + \lambda k$ (parallel in 3D)