Department of Physics, Shiv Nadar Institution of Eminence

Spring 2025

PHY102: Introduction to Physics-II

Tutorial – 01

1. Find the volume of a parallelepiped whose edges are given by $\vec{A} = 2\hat{i} + 3\hat{j} - \hat{k}$, $\vec{B} = \hat{i} - 2\hat{j} + 2\hat{k}$, and $\vec{C} = 3\hat{i} - \hat{j} - 2\hat{k}$

2. Find the projection of $\vec{\mathbf{F}} = (y - 1)\hat{i} + 2x\hat{j}$ on $\vec{\mathbf{B}} = 5\hat{i} - \hat{j} + 2\hat{k}$ at the point (2,2,1)

3. Given the two displacements **D** = (6 **i** + 3 **j** − 1 **k**) m and **E** = (4 **i** - 5 **j** − 8 **k**) m, find the magnitude of the displacement 2**D**-**E**.

4. Find the angle between the vectors **A**=$\hat{i}$ +$\hat{k}$ and **B**=$\hat{j}$ +$\hat{k}$

5. Let **C**=**A**-**B** and calculate the dot product of **C** with itself.

6. Find the magnitude of two vectors **A** and **B**, having the same magnitude such that the angle between them is 60^o and their scaler product is ½.

7. Find the area of a triangle with vertices A(1,1,2), B(2,3,5) and C(1,5,5).