

Name: \_\_\_\_\_ Tutorial 1 Registration No: \_\_\_\_\_

**Amrita School of Engineering, Bengaluru Campus, Amrita Vishwa Vidyapeetham**

**19PHY104: Computational Engineering Mechanics-1**

**Topic: Introduction and Vector Algebra**

**Maximum Marks: 10 (all questions carry 2.5 marks each)**

1. Why should we study Engineering Mechanics in B.Tech CS-AI Course/Program?

3. Consider  $\vec{a}$  and  $\vec{b}$  as two vectors in 3D Cartesian space, represented as column vectors. Determine the sum of the vectors, their dot product and their cross-product [The components of  $\vec{a}$  and  $\vec{b}$  can be assumed randomly].

2. What are the idealizations and assumptions in study of mechanics? Elaborate briefly on each point.

4. Consider a cuboid of dimension  $2 \times \text{rollNo}$ ,  $4 \times \text{rollNo}$  and  $6 \times \text{rollNo}$  along the  $X$ ,  $Y$  and  $Z$  axes, respectively. It is centered at the origin. Prove that the sum of two body-diagonal vectors (corresponding to opposite edges) from bottom face to top face and sum of the other two body-diagonal vectors from top face to bottom face, add up to a zero vector.