School of Basic Sciences
Department of Basic Sciences
Mid Term Examination

Exam Date: 01 Oct 2023
Time : 90 Minutes
Marks : 50

Sem V - C1UD501T - Classical and Statistical Mechanics
Your answer should be specific to the question asked
Draw neat labeled diagrams wherever necessary

1) Explain the closed and open orbits   K2 (2)

2) Why does Langrangian mechanics comes after newtonian mechanics.   K1 (3)

3) Illustrate all three laws of Kepler Motion.   K2 (4)

4) Show the concept of symmetries in Hamiltonian mechanics and how they relate to conserved quantities.   K2 (6)

5) Utilize the idea of phase space quantization.   K3 (6)

6) A particle of mass 2 kg moves along a straight line under the influence of a potential energy function $V(x) = 2x^2 + 4x + 5$. Find the Lagrangian function L and the equation of motion for the particle. Also calculate the generalsized momentum.   K3 (9)

7) State and prove D'Alembert Law.   K4 (8)

8) Explain the principle of virtual work and how it is used to analyze systems with constraints.   K4 (12)

OR

Analyze the conditions under which a central force can lead to a closed orbit.   K4 (12)