Haldia Institute of Technology
Department of Applied Science

Assignment - V
Course: PH 301/PH 401
Module 2: Quantum Mechanics

1. What are the limitations of Newtonian mechanics?
2. What do you mean by generalized co ordinate and what are the advantages of generalized co ordinates.
3. Obtain the expression for generalized force and generalized momentum.
4. What is constraint? What are the different types of constraints?
5. What is meant by degrees of freedom of a dynamical system?
6. What is lagrangian of a system?
7. What are the advantages of Lagrangian equation of motion over Newtonian equation of motion?
8. What is meant by cyclic co ordinate?
9. Obtain Hamilton's canonical equation of motion by using the relations between the Hamiltonian and the lagrangian of a system.
10. Write the physical significance of Lagrangian and Hamiltonian of a dynamical system.
11. Derive the Lagrangian and Hamiltonian equation of motion for dynamical systems- (i)Motion of a free particle,(ii) simple harmonic oscillator,(iii)simple pendulum,(iv)central force field, and (v)compound pendulum.
12. Derive the Lagrangian and Hamiltonian equation of motion for a particle falling freely under the influence of gravity.