Roll No. .....

800 -/-/25/30

DS-202

February 2019

M. Sc. Ist Semester Examination

PHYSICS

Paper II : Classical Mechanics

Time 3 Hours] [Max. Marks : Regular 85 / Private 100
[Min. Marks : Regular 28 / Private 33

Note : This question paper is meant for all Regular and Private students. Answer all five questions. All questions carry equal marks. The blind candidates will be given 60 minutes extra time.

1. Discuss D'Alemberts principle of virtual work. Hence deduce Lagrange's equation of motion.

OR

What are Conservation Laws ? Show that homogeneity of time leads to conservation of energy.

2. Discuss Hamilton Jacobi equation. Show that Hamilton's principal function is a generator of a canonical transformation of constant co-ordinate and moments.

OR

Discuss various properties of Poisson's bracket. Obtain equation of motion in Poisson's bracket form.

3. Explain theory of small oscillations and discuss its normal modes.

OR

Deduce expression for Coriolis force on a body in rotating form. Discuss its any two applications.

4. Discuss relativistic generalisation of Newton's Law. Hence introduce the concept of 4-force and 4-vectors.

OR

What is the need of Covariant Formulation ? Deduce expression for Covariant Hamiltonian.

5. Write short notes on any two of the following :
   (a) Constraints and their classification.
   (b) Kepler's Law of Planetary Motion.
   (c) Euler equation of motion for a rigid body.
   (d) Invariance of space and time.