

SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)

(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai — 600 044.

M.Sc.(Physics) END SEMESTER EXAMINATIONS NOVEMBER - 2023

SEMESTER - I

20PPHCT1002 - Classical Mechanics and Relativity

Total Duration : 2 Hrs. 30 Mins.

Total Marks : 60

Section B

Answer any **SIX** questions ($6 \times 5 = 30$ Marks)

1. Obtain Hamilton's equation of motion.
2. Explain Torque-free motion of rigid body.
3. Analyze the generating functions in canonical transformation.
4. Write a note on normal coordinates and normal frequencies of vibrations (small oscillations).
5. Derive Lorentz-transformation equation.
6. State and prove Kepler's law.
7. Derive Hamiltonian-Jacobi theory.
8. Differentiate stable, unstable and neutral equilibrium.

Section C

I - Answer any **TWO** questions ($2 \times 10 = 20$ Marks)

9. Deduce Hamilton's equations from variational principle.
10. Obtain an expression for Euler's equation of motion.
11. Explain the concept of four vectors in Relativity.
12. Derive an expression for the linear triatomic molecule.

II - Compulsory question ($1 \times 10 = 10$ Marks)

13. Interpret equations of motion in terms of Poisson's Bracket's form.
