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. END SEMESTER EXAMINATION APRIL/NOV - 2021
SEMESTER - III
14PAMCT3A09 - Classical Mechanics

Total Duration : 3 Hrs	**Total Marks : 75**
MCQ : 30 Mins	MCQ : 15
Descriptive : 2 Hrs.30 Mins	Descriptive : 60

Section B

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

1. Show that, if the forces acting on a particle are conservative, then the total energy of the particle, $T + V$ is conserved.

2. Explain Brachistochrone problem.

3. Explain Coriolis Effect.

4. Derive the Euler equation of motion for a rigid body with one fixed point.

5. State and prove Jacobi's identity for Poisson bracket.

6. Derive the equation of motion of Atwood's machine.

7. Derive the Hamilton's canonical equation of motion.

8. State and prove Jacobi's form of principle of least action.

Section C

Part A

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

9. Derive the Lagrange's equation of motion.

10. Discuss Kepler's problem using Routh's procedure.

11. Discuss about the Harmonic Oscillator problem.

12. State and prove Euler's theorem.

Part B

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

13. Derive the Hamiltonian's principle of least action.