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
20PAMCT3009 - 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. Derive the equation of motion of Atwood's machine.
2. Derive Euler's Lagrange differential equation.
3. State and prove Euler's theorem.
4. Show that, the angular momentum vector is related to the angular velocity by a linear transformation.
5. Show that, the fundamental Poisson brackets are invariant under canonical transformation.
6. State and prove principle of conservation of energy.
7. Explain Geodesic problem.
8. Derive Jacobi's identity.

Section C

Part A

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

9. State and prove Hamilton's principle.
10. Derive the Hamilton's canonical equation of motion.
11. Find the equation of motion of one dimension Harmonic Oscillator.
12. Derive the Euler equation of motion for a rigid body with one fixed point.

Part B

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

13. Derive the Lagrange's equation of motion.