



THE AMERICAN COLLEGE, MADURAI

(An Autonomous Institution Affiliated to Madurai Kamaraj University)

Re-accredited (2nd Cycle) by NAAC with Grade "A", CGPA – 3.46 on a 4-point scale

Backlog Arrear Examination, March 2021

Classical & Quantum Mechanics

PGP 4422

Time: 3 Hrs

Max.Marks:75

PART A

ANSWER ANY 5 QUESTIONS

5X 15 = 75

1. Derive Lagrange's equation from D'Alembert principle.
2. Derive Lagrange's equation from variational principle.
3. What are Euler's angles? Derive the transformation matrix for rotation using Euler's angles.
4. Explain Transcritical and Pitchfork bifurcations in detail with example and necessary diagrams.
5. Write a note on wave packets and give its mathematical analysis.
6. Derive Ehrenfest's theorem.
7. Explain quantum linear harmonic oscillator in detail.