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

Course Code: PSP 5401 **Time: 3 Hours**

Course Title: Quantum Mechanics - II **Max. Mark: 75**

PART – A

Answer Any FIVE Questions **(5x 15 = 75)**

1. Obtain the Clebsh – Gordon coefficients for a system having $j_1 = 1$ and $j_2 = {}^1/_2$.
2. Describe the scattering experiments in laboratory and centre of mass coordinate system.
3. Explain the Variational principle and apply the variation method for excited states.
4. A perturbation $H'(t)$ is ON in a system for a time t. Obtain the expression for calculating the probability that a transition has occurred to state k from state n during this time.
5. Establish the relation between Einstein's A and B coefficients.
6. Deduce the Klien-Gordan equation and interpret it in detail.
7. Derive the classical field equation in terms of Lagrangian density.

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