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: PGP 4426/PGP 563 **Time: 3hrs**

Course Title: Nuclear & Particle Physics/Nuclear Physics **Max: 75 marks**

PART - A

Answer ANY FIVE questions **(5 X 15 = 75)**

1. Write down the properties of nuclear forces. Explain Meson theory of nuclear forces and obtain the range of the nuclear field using Yukawa's assumptions.
2. Describe the Fermi gas model and obtain expression for Fermi energy of the nucleons.
3. Write down the semi-empirical mass formula for the nucleus and explain the various terms that contribute to it.
4. Discuss Gamow's theory of α- decay with neat diagrams.
5. Derive the solutions of Q-equations and discuss the exoergic and endoergic reactions with suitable examples.
6. What is nuclear chain reaction? Discuss about the four-factor formula for a nuclear reactor with necessary diagrams.
7. Write an essay on classification of elementary particles.

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