



# THE AMERICAN COLLEGE, MADURAI

(An Autonomous Institution Affiliated to Madurai Kamaraj University)  
Re-accredited (2<sup>nd</sup> Cycle) by NAAC with Grade "A", CGPA – 3.46 on a 4-point scale

## Backlog Arrear Examination, March 2021

**Course Code: PHS 3556**

**Time: 3 hr**

**Course Title: Nuclear Physics**

**Max.Mark: 75**

Answer **any five** of the following questions.

**5 X 15 = 75 marks**

1. Explain the existence of magic numbers in view of shell model and discuss about the prediction of this model.
2. Elaborately describe Fermi theory of  $\beta$  decay based on Pauli's neutrino hypothesis.
3. Describe the construction and working principle of a (Geiger- Muller) GM counter as a particle detector.
4. Discuss the construction and action of a cyclotron with its limitations.
5. What is a chain reaction? Discuss about the four-factor formula for a nuclear reactor with necessary diagrams.
6. Classify the fundamental elementary particles with a neat flow chart. And also write a note on conservation strangeness of the particle.
7. Discuss and list out the various types of quarks and discuss the quark model in detail.

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