



# 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: PHY 3576**

**Time: 3hrs**

**Course Title: Nuclear and Particle Physics**

**Max: 75 marks**

### PART - A

**Answer ANY FIVE questions**

**(5 X 15 = 75)**

1. Describe the construction and working of Bainbridge mass spectrograph with a neat diagram. Also discuss about its advantages and disadvantages.
2. Elaborately discuss about the binding energy terms required for expressing the atomic mass of a nuclide and thereby derive the semi-empirical mass formula.
3. Give a brief account on Fermi's theory of  $\beta$ -decay and explain how Coulomb effect modifies the result.
4. Explain the construction and working of Wilson cloud chamber and bubble chamber with neat diagrams.
5. Explain the working principle of cyclotron and synchrocyclotron with neat diagrams.
6. What is nuclear chain reaction? Discuss about the four-factor formula for a nuclear reactor with necessary diagrams.
7. Discuss about the classification of elementary particles.

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