

Roll No.
1000 -/-/40/20

January 2017

M. Sc. IIIrd Semester Examination

PHYSICS

Second Paper : Nuclear and Particle Physics

Time 3 Hours]

[Max. Marks : Regular 85 / Private 100

Note : This question paper is meant for all Regular and Private students. Answer all five questions. All questions carry equal marks. The blind candidates will be given 60 minutes extra time.

1. What information about nuclear force one gets from low- energy $n-p$ scattering ? Why this scattering will be different for $p-p$ scattering ?

Why the scattering study is restricted only to low energy ?

OR

Explain one example each of a direct and a compound nuclear reaction emphasizing the difference in the basic assumptions of the models used.

2. Explain Bohr-Wheeler Theory of Nuclear Fission. Discuss its limitations, if any.

OR

(a) Derive the parity and spin on Li^5 in its ground state and the first excited state.

(b) Define quadrupole moment. What information one gets from its value ?

3. Discuss how orbit and phase stability is achieved in a synchro-cyclotron. Why these are important?

OR

Describe the principle and working of a betatron. Why its design is different from an ordinary cyclotron ? Discuss its limitations.

4. Explain Fermi Theory of Beta Decay. How is it verified ?

OR

How the parity violation could be observed experimentally ? What is its significance ?

5. Explain the SU(3) classification of particles. Enumerate its limitations.

OR

Define charge conjugation and strangeness. Give two examples each of their conservation. Are they always conserved ?

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