

B.Sc. Semester - 5 (NEP-2020) Examination**Oct/Nov - 2025****PHY: Nuclear & Particle Physics (Major-12)****Time: 2:00 Hours****Marks: 50****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate marks.

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- Que.1 Answer any 2 out of 3 of the following questions. (10)
- (1) Describe Rutherford's experiment of artificial transmutation.
 - (2) Explain the Liquid drop model.
 - (3) Discuss the semi-empirical mass formula.
- Que.2 Answer any 2 out of 3 of the following questions. (10)
- (1) Write a note on a Nuclear Reactor.
 - (2) Explain Gravitation and Inertial Plasma confinement.
 - (3) Explain Bohr and Wheeler's theory of nuclear fission.
- Que.3 Answer any 2 out of 3 of the following questions. (10)
- (1) Explain conservation laws in elementary particles.
 - (2) Explain in detail the fundamental Interactions.
 - (3) Write not on the Quark model.
- Que.4 Answer any 2 out of 3 of the following questions. (10)
- (1) Explain half-life and mean life for radioactivity.
 - (2) Discuss the continuous Beta ray spectrum.
 - (3) Describe Gamow's explanation of alpha decay.
- Que.5 Answer any 5 out of 8 of the following questions in short (10)
- (1) Define Nuclear Magnetic Moment.
 - (2) Explain in brief: Binding energy.
 - (3) Explain the concept of an Antiparticle.
 - (4) What is the Lepton Quantum number? Give one example of it
 - (5) Discuss the Hydrogen Bomb in short.
 - (6) Define Nuclear fission.
 - (7) Define Carbon dating.
 - (8) Discuss the unit of radioactivity.
