

B.Sc. Semester - 5 (Remedial) (CBCS) Examination**March/April-2025 (NEW COURSE)****Nuclear & Particle Physics(Core)****Time: 2:30 Hours****Marks: 70****Instructions:**

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

Que-1(A) Answer the following questions (Any two out of three) (10)

- 1) Describe the liquid Drop Model.
- 2) Write a note on Nuclear force.
- 3) Derive Semi-Empirical mass formula.

Que-1(B) Answer the following questions (Any one out of two) (04)

- 1) Explain the stability of a nucleus.
- 2) Write a note of the radius of the nucleus.

Que-2(A) Answer the following questions (Any two out of three) (10)

- 1) Explain the Pauli's neutrino hypothesis for beta decay.
- 2) Derive and explain the exponential law of radioactive decay.
- 3) Explain Internal conversion.

Que-2(B) Answer the following questions (Any one out of two) (04)

- 1) Explain Carbon dating.
- 2) Explain Gamow explanation of Alpha.

Que-3(A) Answer the following questions (Any two out of three) (10)

- 1) Describe the construction and working of the Scintillation counter.
- 2) Explain the interaction between energetic charged particles and matter.
- 3) Derive the Q-value equation for nuclear reaction.

Que-3(B) Answer the following questions (Any one out of two) (04)

- 1) Write the Advantages and Disadvantages of a G.M counter.
- 2) Explain the Threshold energy of an Endoergic reaction.

Que-4(A) Answer the following questions (Any two out of three) (10)

- 1) Write a note on the linear Accelerator.
- 2) Explain the principle and workings of Cyclotron.
- 3) What is a Nuclear Reactor? Explain it in detail.

Que-4(B) Answer the following questions (Any one out of two) (04)

- 1) Explain Nuclear Fission.
- 2) Explain the principle of Betatron.

Que-5(A) Answer the following questions (Any two out of three) (10)

- 1) Explain the thermonuclear Fusion in the Sun.
- 2) Write notes on the Quark Model.
- 3) Discuss the Conservation laws and Symmetry for elementary particles.

Que-5(B) Answer the following questions (Any one out of two) (04)

- 1) Explain Magnetic Confinement.
- 2) Write a note on a Hydrogen Bomb.
