

B.Sc. Semester - 5 (CBCS) Examination
Oct/Nov - 2023 (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.

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- Que.1(A) Answer the following question. (any two) (10)
1. Write a note on Liquid drop model.
 2. Write semi-empirical mass formula and explain its terms.
 3. Explain Rutherford's α -scattering experiment.
- Que.1(B) Answer the following question. (any one) (04)
1. Explain curve of Binding Energy vs Atomic number.
 2. Discuss nuclear size.
- Que.2(A) Answer the following question. (any two) (10)
1. Explain half life and mean life for radioactivity.
 2. Describe the theory of alpha decay.
 3. Explain continuous beta ray spectrum.
- Que.2(B) Answer the following question. (any one) (04)
1. Write properties of γ -ray.
 2. Discuss Fermi theory of beta decay.
- Que.3(A) Answer the following question. (any two) (10)
1. Explain working principle and construction of G.M. counter.
 2. Describe the interaction between energetic particle and matter.
 3. Explain Q-value of nuclear reaction and obtain equation of Q-value for nuclear reaction.
- Que.3(B) Answer the following question. (any one) (04)
1. Explain transmutation by neutrons.
 2. Explain working principle of scintillation counter.
- Que.4(A) Answer the following question. (any two) (10)
1. Describe construction and working mechanism of cyclotron.
 2. Describe main components of nuclear reactor.
 3. Explain construction and working of linear accelerator.
- Que.4(B) Answer the following question. (any one) (04)
1. Write a note on atom bomb.
 2. Describe self-sustaining chain reaction.
- Que.5(A) Answer the following question. (any two) (10)
1. Explain fusion reactor and condition for reaction.
 2. Give classification of elementary particles.
 3. Explain conservation laws of elementary particles.
- Que.5(B) Answer the following question. (any one) (04)
1. Write a note on gravitational and inertial plasma confinement.
 2. Describe quarks model for hadrons.
