

B.Sc. Semester - 6 (CBCS) Examination
March/April-2024 (OLD COURSE)
NUCLEAR AND 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 questions. (any one) (07)
1. Explain shell model in detail.
 2. Explain binding energy.
- Que.1(B) Answer the following questions. (any one) (04)
1. Explain liquid drop model in detail.
 2. Explain Rutherford's alpha scattering experiment.
- Que.1(C) Answer the following questions. (any three) (03)
1. What are the units of radioactivity?
 2. Define nucleus.
 3. Nucleus is neutral (True/False).
 4. Define isobar.
 5. Write magic numbers.
- Que.2(A) Answer the following questions. (any one) (07)
1. Describe theory of alpha decay paradox.
 2. Explain fermi theory of beta decay.
- Que.2(B) Answer the following questions. (any one) (04)
1. Explain carbon dating.
 2. Explain natural radioactivity.
- Que.2(C) Answer the following questions. (any three) (03)
1. Alpha particle carries Unit of positive charge.
 2. The gamma particle has charge.
 3. Gamma rays travel with the velocity of
 4. rays are not affected by magnetic field.
 5. 1 Curie = Disintegration/sec.
- Que.3(A) Answer the following questions. (any one) (07)
1. Explain GM counter.
 2. Explain scintillation counter.
- Que.3(B) Answer the following questions. (any one) (04)
1. Explain interaction of alpha particle with matter.
 2. Describe types of nuclear reaction.
- Que.3(C) Answer the following questions. (any three) (03)
1. Write the principle of ionization counter.
 2. and are heavy charged particles.
 3. (n, ∞) reaction is belong to the transmutation by.....
 4. Define range of nuclear radiation.
 5. What is endoergic reaction?
- Que.4(A) Answer the following questions. (any one) (07)
1. Explain synchrocyclotron.
 2. Explain breeder reactor.

- Que.4(B) Answer the following questions. (any one) (04)
1. Derive formula of cyclotron frequency.
 2. Describe moderator.
- Que.4(C) Answer the following questions. (any three) (03)
1. The cosmotron
 2. In Betatron, electron accelerated by
 3. An accelerator, consists of one dee is the modified form of
 4. 1 amu = MeV
 5. Natural uranium contains U^{235}
- Que.5(A) Answer the following questions. (any one) (07)
1. Explain proton-proton cycle.
 2. Explain quark model.
- Que.5(B) Answer the following questions. (any one) (04)
1. Explain hydrogen bomb.
 2. Write a note on classification of elementary particles.
- Que.5(C) Answer the following questions. (any three) (03)
1. What is tokamak.
 2. Pions, kaons are known as
 3. Positron is antiparticle of
 4. Proton and neutron jointly called
 5. Define fusion.
