

B.Sc. Semester - 6 (CBCS) Examination
March/April-2023 (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.

Q.1(a) Answer the following questions (any one) (07)

- 1) Explain Rutherford's atom model.
- 2) Explain semi empirical mass formula.

Q.1(b) Answer the following questions (any one) (04)

- 1) Obtain classification of nuclei.
- 2) Explain binding energy.

Q.1(c) Answer the following questions (any three) (03)

- 1) What are the units of radioactivity?
- 2) Define isomer.
- 3) Write binding energy formula.
- 4) Define isotope.
- 5) Write volume term in semi empirical mass formula.

Q.2(a) Answer the following questions (any one) (07)

- 1) Describe theory of alpha decay.
- 2) Explain the law of radioactive decay.

Q.2(b) Answer the following questions (any one) (04)

- 1) Explain carbon dating.
- 2) Explain beta decay.

Q.2(c) Answer the following questions (any three) (03)

- 1) Alpha particle carries Unit of positive charge.
- 2) The beta particle has charge.
- 3) Gamma rays travel with the velocity of
- 4) rays are not affected by magnetic field.
- 5) 1 Curie = Disintegration/sec.

Q.3(a) Answer the following questions (any one) (07)

- 1) Explain GM counter.
- 2) Explain plateau curve.

Q.3(b) Answer the following questions (any one) (04)

- 1) Explain Q value.
- 2) Describe types of nuclear reaction.

Q.3(c) Answer the following questions (any three) (03)

- 1) and are uncharged radiation.
- 2) and are heavy charged particles.
- 3) (n, ∞) reaction is belong to the transmutation by.....
- 4) In (d, n) reaction, the target nucleus is bombarded by
- 5) In pair production, generated.

Q.4(a) Answer the following questions (any one) (07)

- 1) Explain cyclotron.
- 2) Explain chain reaction.

Q.4(b) Answer the following questions (any one) (04)

- 1) Explain principle of phase stability.
- 2) Describe critical size.

Q.4(c) Answer the following questions (any three) (03)

- 1) Chain reaction is not possible in Uranium.
- 2) Reaction takes place in atom bomb.
- 3) An accelerator, consists of one dee is the modified form of
- 4) The frequency of cyclotron is
- 5) The energy of an ion in cyclotron

Q.5(a) Answer the following questions (any two) (07)

- 1) Explain nuclear fusion.
- 2) Explain particle and antiparticle.

Q.5(b) Answer the following questions (any one) (04)

- 1) Explain hydrogen bomb.
- 2) Explain quark model.

Q.5(c) Answer the following questions (any three) (03)

- 1) The sun radiates joule energy per second.
- 2) Pions, kaons are known as
- 3) Positron is antiparticle of
- 4) Proton and neutron jointly called
- 5) In proton-proton cycle the Escape.
