K23U 2840

Reg. No. : .....

Name : .....

V Semester B.Sc. Degree (CBCSS – Supplementary) Examination, November 2023
(2017 and 2018 Admissions)
CORE COURSE IN PHYSICS
5B10PHY : Atomic, Nuclear and Particle Physics

Time : 3 Hours Max. Marks : 40

Instruction : *Write answers in* ***English*** *only.*

SECTION – A

Answer **all** – Very Short Answer Type. **Each** question carries **one** mark. **(4×1=4)**

1. _____ suggested that atoms are made up of positively charged lumps of matter with electrons embedded in them.
2. The nucleus mass effects the _____ of spectral lines.
3. A system of particle is stable when its total energy is
4. Joining two lighter nuclei into a single nucleus is called

SECTION – B

Answer **any seven** – Short answer type. **Each** question carries **two** marks. **(7×2=14)**

5. Define activity.
6. According to Quark Model, what is the charge of a hadron ?
7. What are magic nuclei ?
8. Distinguish between isotopes and isomers.
9. Give the quark model for a proton.
10. What is nuclear density ?

P.T.O.

11. List the members of radioactive series.

12. Give some examples for nuclear hazards.

13. What are mesons ?

14. What is L-S coupling ?

SECTION – C

Answer **any four** – Short Essay/Problem. **Each** question carries **three** marks. **(4×3=12)**

15. Explain Bohr atom model.

16. Distinguish between symmetric and antisymmetric wave functions.

17. Find the density of $^{12}C_6$ nucleus.

18. The binding energy of $^{20}Ne_{10}$ is 160.647 MeV. Find its atomic mass.

19. Find the activity of 1.00 mg of ^{222}Rn whose atomic mass is 222u.

20. An electron collides with a hydrogen atom in its ground state to n = 3. How much energy was given to the hydrogen atom during this inelastic collision (KE is not conserved) ?

SECTION – D

Answer **any two** – Long Essay type. **Each** question carries **five** marks. **(2×5=10)**

21. Explain liquid drop model in detail.

22. Explain Franck-Hertz experiment.

23. Explain the energy production in stars.

24. Explain the four fundamental interactions in nature and also discuss the various types of elementary particles.
