QP CODE: 104018 **Reg. No: ……..**

First Year B.Sc (MRT) Degree Regular/Supplementary Examinations March 2025
Atomic and Nuclear Physics

Time: 3 Hours **Total Marks: 100**

- ***Answer all questions to the point neatly and legibly • Do not leave any blank pages between answers • Indicate the question number correctly for the answer in the margin space***
- ***Answer all parts of a single question together • Leave sufficient space between answers***
- ***Draw table/diagrams/flow charts wherever necessary***

Essays: **(2x20=40)**

1. Explain Bohr's theory of hydrogen atom. What are its limitations.
2. Explain Thomson's e/m experiment.

Short notes: **(8x5=40)**

3. Write a short note on the nature and properties of cathode rays.
4. Give a qualitative explanation of Zeeman effect.
5. Explain neutrino hypothesis
6. What are auger electrons
7. Explain Law of radioactive disintegration and obtain expression for half-life.
8. Discuss the origin of γ- rays.
9. Discuss the relation between phase and group velocities of matter waves.
10. Explain beta decay with an example.

Answer briefly: **(10x2=20)**

11. What is a nucleus. Give three of its properties.
12. What is Larmor frequency. Give an expression for it.
13. What is l-s coupling.
14. State Pauli's exclusion principle.
15. Write Einstein's photoelectric equation and explain the terms.
16. List four uses of radioactivity.
17. What is meant by mean life.
18. What is Bohr magneton. What is its value.
19. Write any two properties of β- ray.
20. Define mass defect and binding energy.

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