

QP CODE: 104018

Reg. No:

**First Year B.Sc (MRT) Degree Supplementary Examinations
September 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. What is photoelectric effect. Starting from experimental observations, explain how the wave nature of light unable to explain the observed properties of photoelectric effect. How did Einstein explain it successfully.
2. Explain Thomson's atom model, discussing its merits and demerits.

Short notes:

(8x5=40)

3. Meson theory.
4. What is nuclear isomerism.
5. Explain radioactive equilibrium.
6. What are coupling schemes.
7. Explain Ritz combination principle.
8. How did Rutherford try to rectify problems of Thomson's atom model.
9. What is the difference between excitation energy and ionisation energy.
10. What are stationary states in Bhor Model.

Answer briefly:

(10x2=20)

11. What are the uses of nuclear reactors.
12. Define radioactive decay constant.
13. What is j-j coupling.
14. Define critical mass of a chain reaction.
15. Write De Broglie's equation and explain the terms.
16. List properties of nuclear forces.
17. What is meant by half-life.
18. What is beta decay.
19. Write any two properties of α - rays.
20. What is moderator. Give three examples.
