

QP CODE: 104018

Reg. No:

**First Year B.Sc (MRT) Degree Regular/Supplementary Examinations
March 2024
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 in detail Stern-Gerlach experiment and discuss its important outcomes.
2. Explain Rutherford α particle scattering experiment.

Short notes:

(8x5=40)

3. Millikan's experiment to determine the charge of an electron.
4. What are the important postulates of Bohr atom model.
5. State and explain uncertainty principle.
6. Discuss Meson theory of nuclear forces.
7. Discuss Law of radioactive disintegration and obtain expression for half-life.
8. Discuss the origin of γ - rays.
9. Discuss Larmour precession.
10. Discuss Elliptical orbits in Sommerfeld relativistic atom model.

Answer briefly:

(10x2=20)

11. Mention any two important sources of electron.
12. What is excitation potential of an atom.
13. What is j-j coupling.
14. State and explain Pauli's exclusion principle.
15. Write down Einstein's photo electric equation and explain the terms.
16. Mention any four uses of radioactivity.
17. Define decay constant.
18. What is Bohr magneton and its value.
19. Write any two uses of α - ray.
20. What is meant by conversion electron.
