

QP CODE: 104018

Reg. No:

**First Year B.Sc (MRT) Degree Supplementary Examinations
September 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. With theory and neat diagram, explain Stern- Gerlac experiment.
2. Derive Einstein's photoelectric equation. Explain Millikan's verification of Einstein's equation.

Short notes:

(8x5=40)

3. Quantum numbers.
4. Derive the relation between half-life and mean life.
5. Explain the production of long lived and short lived isotopes.
6. Coupling schemes.
7. Derive an expression for De Broglie wavelength.
8. What are the deficiencies of Bhor atom model.
9. What is meant by relativistic correction.
10. Explain Alpha decay with an example.

Answer briefly:

(10x2=20)

11. What is atomic mass unit. What is its value in electron volt.
12. Nuclear fission.
13. Explain the action of moderator in a nuclear reactor.
14. Uncertainty principle.
15. Write photoelectric equation and explain the terms.
16. Wave packet.
17. What is the mathematical expression for the radius of the nucleus.
18. Natural radio activity.
19. Write any two properties of γ - ray.
20. Explain binding energy of nucleus.
