QP CODE: 104018 **Reg. No: ……..**

First Year B.Sc (MRT) Degree Regular/Supplementary Examinations March 2021
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 the production, properties of cathode rays in Thomson's model. Interpret the e/m ratio of electron by Thomson experiment.
2. Explain photoelectric effect to illustrate the particle nature of light and explain the factor effecting the photoelectric current in detail.

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

3. Explain detail various quantam numbers associated with vector atom model.
4. Primary and secondary cosmic rays.
5. Derive an expression for a half-life of radioactive substance in terms of decay. Write the relation between mean life and decay constant.
6. State four distinguish properties of β and ϒ.
7. Explain the limitation of Bohr's atom model.
8. Explain Radioactive equilibriums.
9. Explain process of pair production.
10. Explain sommerfield's relativistic atom.

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

11. Range of alpha particle.
12. State the properties of neutrons.
13. Process of electron capture.
14. Units of a radioactive substance.
15. State the postulates of Bohr's theory of hydrogen atom.
16. Define the specific charge of electron, what is the value of e/m of cathode rays.
17. Finite range of Beta particles.
18. What are different types of mesons.
19. Explain the reasons for the instability of the nucleus.
20. Define the types of nuclear reactions.

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