QP CODE: 104018 **Reg. No: ……..**

First Year B.Sc (MRT) Degree Supplementary Examinations March 2020

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 structure of an atom, properties, reason for nuclear instability.
2. Describe the construction and working of Aston spectrograph with necessary theory. State its limitations

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

3. Discuss the properties of atomic nucleus.
4. Discuss the radioactive equilibrium.
5. Write De Broglie theory.
6. State and explain important features of nuclear forces.
7. State properties of electromagnetic waves.
8. Distinguish between isotope and isobar with an example. What is isotone.
9. Explain Paul's exclusion principle.
10. Derive expression for Zeeman's effect.

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

11. Define binding energy.
12. Bohr Magnetron.
13. Give drawbacks of Rutherford atom model
14. Properties of Υ rays.
15. Write the relationship between half-life and mean life.
16. Write the properties of short lived and long lived radioisotopes
17. The ground state energy of hydrogen atoms -13.6 eV. What are the kinetic and potential energies of electron in this state.
18. Write about electron capture process.
19. What is the role of a moderator in a nuclear reactor.
20. Write Auger electrons.

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