

QP CODE:104018

Reg.No:

First Year B.Sc (MRT) Degree Supplementary Examinations August 2016

Atomic and Nuclear Physics

Time: 3 Hours

Total Marks: 100

- Answer all Questions.
- Draw Diagrams wherever necessary.

Essay

(2x20=40)

1. State and explain the assumption of Bohr's theory, postulates, and evaluate with respect to merits and demerits
2. What is radioactivity. Mention the types of decay in detail and explain radioactive decay law by deriving the formula.

Short notes:

(8x5=40)

3. Explain nuclear fission and nuclear fusion with example.
4. Define and explain binding energy. How does binding energy per nucleon vary with mass number. What is the significance.
5. Discuss neutrino hypothesis.
6. What is photo electric effect and state its laws, derive the Einstein photoelectric equation
7. Explain excitation and ionization in relation to its potential.
8. A radioactive substance has half life of 5 years. Calculate the fraction of atoms of this substance would decay in 15 years.
9. Explain the process of electron capture in β decay.
10. Discuss isomeric transistion

Answer briefly:

(10x2=20)

11. What are Meson.
12. What is the activity of a radioactive substance.
13. What are the properties nuclear forces.
14. What is atomic mass unit. Express it in Kg
15. What is role of a moderator in a nuclear reactor
16. Why does electron revolving around the nucleus write its energy.
17. The half life of radium is 1600yr. After how many years 1 kg of sample reduce to 50 gm calculate using formula.
18. Define binding energy Sketch the graph between binding energy per nucleon and mass number.
19. What are the drawback of the Rutherford atomic model.
20. The Ir-192 radioactive material with 10Ci calculate the strength after 12month.
