

QP CODE:104018

Reg.No:

First Year B.Sc (MRT) Degree Examinations - July 2015

Atomic and Nuclear Physics

Time: 3 Hours

Total Marks: 100

- Answer all Questions.
- Draw Diagrams wherever necessary.

Essay

(2x20=40)

1. What is radioactivity. Explain about radioactive equilibrium its types and modes of radioactive decay.
2. Explain the construction and working of Aston mass spectrograph with necessary theory

Short notes:

(8x5=40)

3. The half life of radioactive substance is one hour. Calculate how long will it take for 60% of the substance to decay
4. What do you understand by radioactive capture (electron capture)
5. What are the drawbacks of Rutherford atomic model
6. Explain about the pair production interaction with matter
7. Explain about Secular equilibrium with example.
8. Write about Experimental verification of Debroglie's waves
9. An electron and proton are possessing same amount of kinetic energy. Which of two have greater de-Broglie's wavelength. Justify your answer.
10. Explain neutrino hypothesis

Answer briefly:

(10x2=20)

11. The laws of photoelectric emissions
12. Explain the term chain reaction
13. What are the uses of radioisotopes
14. Properties of g-rays.
15. What is half life and mean life
16. Explain stopping potential and Threshold wave length
17. Calculate the frequency of photon energy of 0.5 Kev. Given $h=6.62 \times 10^{-34} \text{Js}$
18. What are Auger electrons
19. Properties of nuclear forces
20. Define curie and Becquerel
