Nuclear Physics

Time: 2 hours   **Maximum Marks : 50**

1) Determine a) Radius of nucleus, b) Volume, c) Mass of nucleus and d) density of copper nucleus, having atomic mass number 63. r_0=1.4fm.

2) Show that radius of an atomic nuclei is: $R=R_0 A^{1/3}$.

3) Define the : a)Mass defect b)Binding Energy c)BE/Nucleon d)Packing Fraction.

4)Write short notes on Carbon Dating.

5) A radioactive materials reduces to 20% of its initial quantity in 10 hours . Find its decay constant and half life.

6) Write note on
a) Proportional counter
b) Geiger counter

7) What do you understand mass- energy conservation of nuclear reaction. Define the Q-value of nuclear reaction. Obtain expression of it.

8) Write notes on
a) Nuclear fusion
b) Nuclear fission

9) Explain the interaction between particles and matter.

10) Explain Rutherford α- particle scattering experiment with the help of neat labelled diagram.