## NUCLEAR AND RADIATION PHYSICS

### Paper-C
### Semester-V

Time Allowed : 3 Hours]  [Maximum Marks : 30

Note :  The candidates are required to attempt two questions each from Sections A and B carrying 7 marks each and five questions from section C consisting of 5 short answer types questions carrying 7 marks each.

### SECTION-A

1. What is Binding energy and binding energy per Nucleon? D___ss the variation of binding energy per Nucleon with mass number A.  5
2. Name the forces existing between the Nucleons. Explain the properties of Nuclear forces.  5
3. Outline the basic features of the shell model of the Nucleus. How does it account for the existence of Magic numbers? Just explain Magic number, 2,8,20,28.  5

**SECTION-B**

5. In a given sample of a Radioactive substance the counting rate of particle is 47.5 per minute. After 5 minutes the counting rate is reduced to 27 per minute. Find the decay constant and half-life of the sample. 5

6. Explain Radioactive Dating. 5

7. Write notes on the following : 5
   (a) Geiger-Nuttal law
   (b) Neutrins hypotheses of beta decay.

8. (a) What are the different types of Nuclear reactions? Discuss with examples. 5
   (b) What is Nuclear reaction cross-section?

**SECTION-C**

9. Attempt any five :
   (a) What is a Nuclear reaction?
   (b) Name the Conservation laws of Nuclear reactions.
   (c) What is the difference between half-life and mean-life of a Radioactive substance?
   (d) What is Atomic mass unit?
   (e) Is Neutron a stable particle?
   (f) Write properties of Nuclear forces.
   (g) Who suggested the Liquid drop model? 2×5=10