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Total No. of Pages : 02

Total No. of Questions : 11

M.Sc. (Physics) (Sem.-3)

NUCLEAR PHYSICS

Subject Code : MSPH532-18

M.Code : 76751

Date of Examination : 23-12-2022

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains SEVEN questions carrying FIVE marks each and students have to attempt any SIX questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

- a. Explain the fission phenomenon.
- b. What is binding energy of a nucleus?
- c. List the achievements of shell model.
- d. What is nuclear moment?
- e. In beta decay, what is electron capture?
- f. What are allowed and forbidden transitions?
- g. What do you understand by saturation of nuclear forces?
- h. What are direct reactions?
- i. What is the role of neutrino in beta decay?
- j. What is nuclear resonance?

SECTION-B

2. Explain in detail the spin-orbit coupling.
3. What are the experimental evidence for shell model?
4. Discuss the wave mechanical properties of the nucleus.
5. Explain in detail the meson theory of nuclear forces.
6. What is internal conversion? Give two examples.
7. Explain the theory of alpha decay.
8. Derive Breit-Wigner dispersion formula.

SECTION-C

9. Explain in detail the liquid drop model of nucleus.
10. Describe deuteron problem in detail and discuss its various properties.
11. Describe the fermi theory of beta decay. What are Kurie plots?

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.