M.Sc. DEGREE EXAMINATION,NOVEMBER 2019
II Year III Semester
Nuclear Physics and Particle Physics

Time : 3 Hours **Max.marks :75**

Section A $(10 \times 2 = 20)$ Marks

Answer any **TEN** questions

1. What is scattering length?
2. Nuclear force is tensor force in deuteron. How?
3. Name any four conservation laws obeyed in nuclear reactions.
4. Define nuclear scattering cross section.
5. Write the drawbacks of liquid drop model.
6. What is the significance of magic numbers?
7. What is neutrino?
8. Give an account of comparative half-lives in beta decay.
9. What is Quark model?
10. What is meant by strangeness number?
11. What is meant by parity?
12. State isospin formalism.

Section B $(5 \times 5 = 25)$ Marks

Answer any **FIVE** questions

13. Explain the significance of Yukawa nuclear potential.
14. Discuss about compound nucleus reaction.
15. Explain Bohr Wheeler theory of nuclear fission.
16. Write notes on nuclear isomerism.
17. Explain the types of interaction between elementary particles.
18. Discuss in brief about angular momenta and parities of nuclear ground states.
19. Explain the different types of nuclear reactions.

Section C $(3 \times 10 = 30)$ Marks

Answer any **THREE** questions

20. Explain the meson theory of nuclear forces.
21. Derive the Breit-Wigner one level formula for nuclear reaction.
22. What are drawbacks of shell model? Explain the features of vibrational and rotational states of nuclear collective model.
23. Explain Fermi's theory of beta decay and determine the mass of the neutruino.
24. Deduce the Gell-Mann-Okubo mass formula for octet and decuplet hadrons.

M.Sc. DEGREE EXAMINATION,NOVEMBER 2019
II Year III Semester
Nuclear Physics and Particle Physics

Time : 3 Hours **Max.marks :75**

Section A $(10 \times 2 = 20)$ Marks

Answer any **TEN** questions

1. What is scattering length?
2. Nuclear force is tensor force in deuteron. How?
3. Name any four conservation laws obeyed in nuclear reactions.
4. Define nuclear scattering cross section.
5. Write the drawbacks of liquid drop model.
6. What is the significance of magic numbers?
7. What is neutrino?
8. Give an account of comparative half-lives in beta decay.
9. What is Quark model?
10. What is meant by strangeness number?
11. What is meant by parity?
12. State isospin formalism.

Section B $(5 \times 5 = 25)$ Marks

Answer any **FIVE** questions

13. Explain the significance of Yukawa nuclear potential.
14. Discuss about compound nucleus reaction.
15. Explain Bohr Wheeler theory of nuclear fission.
16. Write notes on nuclear isomerism.
17. Explain the types of interaction between elementary particles.
18. Discuss in brief about angular momenta and parities of nuclear ground states.
19. Explain the different types of nuclear reactions.

Section C $(3 \times 10 = 30)$ Marks

Answer any **THREE** questions

20. Explain the meson theory of nuclear forces.
21. Derive the Breit-Wigner one level formula for nuclear reaction.
22. What are drawbacks of shell model? Explain the features of vibrational and rotational states of nuclear collective model.
23. Explain Fermi's theory of beta decay and determine the mass of the neutruino.
24. Deduce the Gell-Mann-Okubo mass formula for octet and decuplet hadrons.