Roll No. | | | | | | | | | | | | **Total No. of Pages : 02**

Total No. of Questions : 09

M.Sc (Physics) (Sem.–3)

PARTICLE PHYSICS

Subject Code : MSPH-533-21

M.Code : 92537

Date of Examination : 16-12-22

Time : 3 Hrs. **Max. Marks : 60**

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR 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) Discuss the properties of fermions.

b) What is Yukawa picture?

c) Explain charge conjugation giving an example.

d) What is elastic cross section?

e) Discuss Lorentz invariance phase space.

f) What are dalitz plots?

g) Briefly describe Mandelstem variables.

h) Discuss the importance of color in quarks.

i) What is CP violation?

j) What are strange particles?

SECTION-B

2. Describe in detail the four fundamental interactions.

3. Explain CPT theorem.

4. Explain the role of cross section and decay rates in particle physics.

5. Define helicity and explain its importance with respect to neutrino.

6. Derive Breit-Wigner dispersion formula.

SECTION-C

7. a) Discuss invariance in quantum mechanics.

   b) Explain the interaction of pion-nucleon.

8. a) Describe two body and three body phase space.

   b) Draw Baryon decuplet and explain various terms.

9. a) Explain how CP is violated in K decay.

   b) Describe how parity is not conserved in beta decay.

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.