

Roll.No.

25PPHCT3009

SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)

(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai - 600 044.

M.Sc.Physics - END SEMESTER EXAMINATIONS - NOVEMBER 2025

SEMESTER - III

25PPHCT3009 - Nuclear and Particle Physics

Total Duration : 2 Hrs. 30 Mins.

Total Marks : 60

Section B

Answer any **SIX** questions ($6 \times 5 = 30$ Marks)

1. Interpret the concept of isospin and isospin quantum number.
2. Explain the liquid drop model of nucleus.
3. Write a note on Yukawa Theory of nuclear forces.
4. Describe Breit-Wigner one level formula.
5. Define parity. Explain the violation of parity conservation during beta decay.
6. Classify the types of interactions between elementary particles.
7. Explain the various conservation laws associated with the nuclear reactions.
8. Analyze the unitary symmetry $SU_{(3)}$ Symmetry of elementary particles.

Section C

I - Answer any **TWO** questions ($2 \times 10 = 20$ Marks)

9. Illustrate the dynamics of compound nuclear reaction and direct reaction in detail.
10. Give an account of fermi theory of beta decay. How does it explain the experimental observations?
11. Derive an expression for the total magnetic moment of the nucleus and explain it with the help of Schmidt diagram.
12. Interpret Meson theory of nuclear forces

II - Compulsory question ($1 \times 10 = 10$ Marks)

13. What do you mean by elementary particles? Describe the classification of elementary particles.
