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. END SEMESTER EXAMINATION APRIL/NOV - 2021
SEMESTER - III
20PPHCT3009 - Nuclear and Particle Physics

Total Duration : 3 Hrs		**Total Marks : 75**	
MCQ	: 30 Mins	MCQ	: 15
Descriptive	: 2 Hrs.30 Mins	Descriptive	: 60

Section B

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

1. Give in brief the spin dependence of nuclear forces.
2. Write a note on compound nucleus.
3. Write down the main points of collective model nuclei.
4. What is neutrino? Give the evidence for the existence of it.
5. Compare the properties of leptons and Hadrons.
6. State and explain the important features of nuclear forces.
7. Find the Q-value of the nuclear reaction ^{7}Li(p,α) ^{4}He. Given that the mass of proton = 1.007825U, mass of ^{7}Li = 7.016004 U ,
   Mass of α particle = 4.002603U = mass of of ^{4}He
8. What are the important features of β-ray spectrum? What is endpoint energy?

Section C

Part A

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

9. Describe the main features of shell model of nucleus. What are the experimental evidences that support this model?
10. Illustrate internal conversion process.
11. Discuss the quark model and explain how mesons and baryons are formed using quarks.
12. Summarize the classification of nuclear reactions with examples.

Part B

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

13. Explain in brief Meson theory of nuclear forces.