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.
B.Sc.Physics - END SEMESTER EXAMINATIONS - APRIL 2025
SEMESTER - V
22UPHCT5011 - Nuclear Physics

Total Duration : 2 Hrs.30 Mins. Total Marks : 60

Section B

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

1. Explain electric quadrupole moment of the nucleus.
2. Give the properties of Alpha, Beta and Gamma rays.
3. Explain the action of linear accelerator.
4. Discuss the working of an ionization chamber.
5. Outline the basic assumptions and properties of quarks.
6. Calculate the binding energy per nucleon for the $_{28}$Ni^{64} and $_{6}$C^{12} nuclei.
   Given the mass of $_{28}Ni^{64} = 63.927\ amu$, mass of a proton $= 1.00727\ amu$ and mass of a neutron $= 1.00866\ amu$ and $_{6}C^{12} = 12\ amu$.
7. Write a note on radio carbon dating.
8. Write a note on Baryons.

Section C

Answer any **THREE** questions $(3 \times 10 = 30$ Marks)

9. Discuss Weizacker's semi-empirical mass formula for a nucleus.
10. Give an account of successive disintegration of radioactive isotope and obtain the condition of secular equilibrium.
11. Describe the construction and working of a cyclotron. Discuss its limitation.
12. Describe the construction and working of Geiger-Muller counter.
    Explain quenching.
13. How can you explain the difference between weak and strong interactions?
    Compare the four fundamental interactions.

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