Roll.No. | 22UCHCT5012

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.Chemistry - END SEMESTER EXAMINATIONS - NOVEMBER 2025
SEMESTER - V
22UCHCT5012 - Spectroscopy

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

Section B

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

1. Explain the interaction of electromagnetic radiation with matter.
2. Write a note on Born-Oppenheimer approximation and its significance.
3. State and verify Beer-Lambert's law. What are its limitations?
4. Calculate λ_{max} value for 1,4-dimethyl cyclohexadiene and 3-methyl-2-cyclohexadiene-1-one.
5. Compare IR and Raman spectroscopic techniques in the identification of carboxyl and hydroxyl groups.
6. Describe Rayleigh scattering, Stokes and anti-Stokes lines in Raman spectroscopy.
7. Explain spin-spin coupling in NMR spectroscopy and its types with examples.
8. Illustrate Mc-Lafferty rearrangement with a suitable example.

Section C

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

9. Explain Boltzmann distribution and discuss how population of energy levels changes with temperature.
10. Distinguish the terms chromophores and auxochromes with examples and explain different types of electronic transitions.
11. Outline various factors affecting fundamental vibrational frequencies with suitable examples.
12. Draw proton NMR spectrum of ethanol and acetone and interpret the signals.
13. Discuss the principle and instrumentation of mass spectrometry with neat diagram and explain important peaks observed in a mass spectrum.

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