

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 - APRIL 2025
SEMESTER - II

24PPHET2B01 - Introduction to Molecular Spectroscopy

Total Duration : 1 Hrs.30 Mins.

Total Marks : 40

Section B

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

1. What are electromagnetic radiation? Give any two example.
2. What are the factors that control the amount of absorbance in UV spectroscopy?
3. In UV/Vis spectrum, Is n to π^* energy is higher than π to π^* . If the statement is correct, give example to prove.
4. Define Hook's law.
5. Define zero point energy.
6. Define larmor precession.
7. State difference Between shielding and deshielding.
8. How NMR acts to organic compound having C^{12} , H^1 , O^{16} and N^{14} ?
9. Define chemical shift of NMR.
10. Define Spin-Spin coupling.
11. What are modes of vibration in molecules? State it's types. Hence calculate for methane molecule.
12. Give the spectral region of IR.

Section C

Answer any **FOUR** questions ($4 \times 5 = 20$ Marks)

13. Explain Chemical Shift of NMR in detail.
14. Give the detailed account on proton NMR spectrum of 1- nitropropane.
15. Explain the IR Spectroscopy of a Vibrating Diatomic Molecule.
16. Give the detailed applications of IR Spectroscopy.
17. Explain the principle construction and working of IR Spectrometer.
18. Explain the principle construction and working of NMR Spectrometer.
