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 - 2024
SEMESTER - II

20PPHET2001 - Spectroscopy

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

Section B

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

1. Give a brief account on classifications of rotors.
2. Discuss the quantum theory of Raman Effect.
3. Interpret the proton NMR spectrum of 1-nitro propane.
4. Write about nuclear-electron spin coupling.
5. Describe the concept of overtone and combination frequencies.
6. Narrate how Raman spectra is useful in determining the structure of a diatomic Molecule.
7. Briefly discuss the concepts of chemical shift with suitable example.
8. Discuss the applications of ESR in CH3 Radical.

Section C

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

9. Describe the experimental arrangement construction, Working and Principle of FTIR Spectrometer, and also explain how the FTIR spectrometer is efficient over IR Spectrometer.
10. Discuss the Rotational spectra of diatomic and Polyatomic molecule.
11. Describe an experimental arrangement for the study of FT-Raman spectra in the laboratory.
12. Explain the basic requirements, description and working of ESR spectrometer.

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

13. Derive the expressions for Bloch equations in NMR spectroscopy.

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