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 EXAMINATIONS APRIL - 2022
SEMESTER -II
20PPHET2001 - Spectroscopy

Total Duration : 3 Hrs. **Total Marks : 60**

Section A

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

1. Explain the rotational spectra of diatomic molecules in microwave spectroscopy.
2. Write down the selection rules for IR vibrational normal modes.
3. Explain in detail the character table for C_2V point group.
4. Explain the importance of Raman effects for phase transition studies.
5. Discuss the structure determination in Raman spectroscopy.
6. With a block diagram explain CW NMR spectrometer.
7. Discuss the application of ESR in biological studies.
8. Explain recoilless emission and absorption in Mossbauer spectroscopy,

Section B

Part A

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

9. Explain Frank Condon principle . Discuss rotational fine structure of electronic-vibration spectra. Also explain with a neat diagram double beam spectrophotometer.
10. Explain the principle of NMR spectroscopy.Discuss in detail about the NMR spectrometer meter with necessary diagram.
11. What is Stark effect? Outline the importance of Stark effect studies in microwave spectroscopy.
12. Draw the block diagram of Raman spectrometer and explain its functions. Describe the structure determination from Raman spectroscopy.

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Part B

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

13. a) What is isomer shift? Explain with examples.
    b) With a block diagram explain Mossbauer spectrometer.

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