

FD-308

M.Sc. 1st Semester Examination, Dec.-Jan., 2021-22

CHEMISTRY

Paper - IV

Theory and Application of Spectroscopy

Note : Answer all questions. All parts of answer of each question should be written in one place. Be precise and to the point in your answer. All questions carry equal marks.

Unit-I

- 1. (a) Explain intensity of spectral lines.
 - (b) Explain factor affecting line width.

OR

- (a) Explain interaction of IR radiation with vibrating molecules.
- (b) Explain interaction of microwave radiation with rotating molecules.

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(Turn Over)

(2)

Unit-II

- **2.** (*a*) Classify rotating molecules on the basis of moment of inertia.
 - (b) Explain interaction of microwave radiation with linear, symmetric top, assymetric top and spherical top molecules.

OR

- (a) Show that microwave spectra are observed at constant spacing.
- (b) Rotational constant of $H^{35}Cl$ is 10.5909 cm⁻¹. Calculate rotational constants for $H^{37}Cl$.

Unit-III

3. Explain theory and application of electron diffraction spectroscopy.

OR

Describe principle and application of Turbidimetry.

Unit-IV

4. (*a*) How will you explain different lines of rotating molecules by colliding microwave radiations ?

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(Continued)

(3)

(b) Explain Raman activity of symmetric top and spherical top molecules.

OR

- (a) How will you explain rotational vibrational Raman spectroscopy ?
- (b) Explain Raman activity of H_2 and H_2O molecules.

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