YMCA UNIVERSITY OF SCIENCE AND TECHNOLOGY, FARIDABAD
M Sc CHEMISTRY EXAMINATION (Under CBS), MAY-2018
SPECTROSCOPY-II (CH-302)

Time: 3 hrs **M.Marks:60**

Note: Part-A is compulsory (word limit 30-40). Attempt any four questions from Part-B

PART-A

Q. 1 (a) What is spin density in ESR?

(b) Define spin-spin relaxation.

(c) What do you understand by Raman effect?

(d) Define symmetry elements in a crystal.

(e) Define Bragg's law?

(f) What do you understand by g-value w.r.t. ESR?

(g) Define nuclear overhauser effect?

(h) What is quadroupole transition?

(i) Define discrepancy index?

(j) How intermolecular and intramolecular H-bonding can be differentiated with the help of IR spectroscopy?

(10x2)

PART-B

Q. 2 (a) Explain rotational vibrational spectrum of a diatomic molecule by taking a suitable example. (5)

(b) Briefly explain simple harmonic vibrator. (5)

Q3 (a) Describe the principle and theory of NMR along with its applications. (5)

(b) Explain the effect of magnetic field and electric field on NQR spectra. (5)

Q.4 (a) Discuss quantum theory of Raman effect. (5)

(b) Briefly discuss the principle of ESR and its application to study of fast reactions. (5)

Q. 5 (a) Explain reciprocal lattice concept and its importance. (5)

(b) Describe the heavy atom method to solve the phase problem in crystallography. (5)

Q.6 (a) Discuss the principle and applications of Fourier Transform Spectroscopy. (5)

(b) What do you understand by chemical shift in NMR spectroscopy? Explain δ-scale of chemical shift. (5)

Q.7 (a) Write a short note on vibrational Raman spectra by taking a suitable example. (5)

(b) Enlighten the differences between X-ray and electron & neutron diffraction techniques. (5)

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