K-402

Roll No. ....

MCH-509

Spectroscopy/Computers/Biology & Mathematics-II

M.Sc. Chemistry(MSCCH)

2nd Semester Examination, 2023 (Dec.)

Time : 2 Hours]   **[Max. Marks : 35**

Note : This paper is of Thirty Five (35) marks divided into two (02) Sections A and B. Attempt the questions contained in these sections according to the detailed instructions given therein. Candidates should limit their answers to the questions on the given answer sheet. No additional (B) answer sheet will be issued.

SECTION–A

(Long Answer Type Questions)

Note : Section 'A' contains Five (05) long answer type questions of Nine and Half (9½) marks each. Learners are required to answer any Two (02) questions only.

$(2 \times 9\frac{1}{2} = 19)$

1. Explain the classical theory of Raman spectrum.

2. Explain the following terms with suitable examples

(a) Chemical shift.

(b) Coupling constant.

3. Discreibe the various methods used for the production of ion in the mass spectrometry.

4. Discuss the following :

(a) Selection rule of rotational spectroscopy.

(b) Selection rules for electronic transitions.

5. Discuss any *two* of the following :

(a) Nuclear overhauser effect (NOE).

(b) Karplus curve.

(c) PQR branches in vibrational-rotational spectrum.

SECTION–B
(Short Answer Type Questions)

Note : Section 'B' contains Eight (08) short answer type questions of Four (04) marks each. Learners are required to answer any Four (04) questions only. (4×4=16)

1. Eplain why *cis* and *trans* isomers differ in their infrared absorptions.

2. What is an algorithm? Draw an algorithm with the maximum among three numbers.

3. Write a note on Beer-Lambert's law.

4. Discuss the fragmentation in the mass spectrometry of carbonyl compounds.

5. Write C program to find the total marks and average marks obtained in three subjects for five students.

6. Discuss the types of molecule on the basis of moment of inertia.

7. Write a short note on Woodward's rule for the diene absorption in UV spectra.

8. What is mutual exclusion principle? Explain its significance taking H_2O and CO_2 molecule as example.

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