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Roll No.

MCH-509

Spectroscopy/Computers/Biology & Mathematics-II

M.Sc. Chemistry (MSCCH)

2nd Semester Examination, 2023 (June)

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 answer 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 ($9\frac{1}{2}$) marks each. Learners are required to answer any Two (02) questions only.
($2 \times 9\frac{1}{2} = 19$)

1. Define the moment of inertia and discuss the rotational spectra of a rigid linear diatomic Molecule.

2. Explain the effect of hydrogen bonding on vibrational frequencies.
3. Explain the following:
 - i. Chemical shift
 - ii. Shielding and deshielding effect
 - iii. Coupling constant
4. Write notes on the Metastable peak and Molecular ion peak.
5. Explain any one computer application which is used in Chemistry.

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. Write a short note in BASIC language.
2. Explain the principle of Mass spectrometry.
3. Why is TMS used as a standard reference in NMR spectroscopy?

4. Write a short note on the principle of Rotational Spectroscopy.
 5. Explain the selection rule for vibrational spectroscopy.
 6. Explain in brief the rule of mutual exclusion.
 7. Name some important solvents, to use in NMR spectroscopy. What are the important characteristics of the solvents used in this technique?
 8. Write a short on the Spin-spin coupling.
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