S-468

Total Pages : 3 Roll No. .....

MSCCH-602

Spectroscopy-II

M.Sc. Chemistry (MSCCH)

3rd Semester Examination, 2022 (Dec.)

Time : 2 Hours] **Max. Marks : 70**

Note : This paper is of Seventy (70) marks divided into two (02) Sections A and B. Attempt the questions contained in these sections according to the detailed instructions given therein.

SECTION–A
(Long Answer Type Questions)

Note : Section 'A' contains Five (05) long answer type questions of Nineteen (19) marks each. Learners are required to answer any Two (02) questions only.

(2×19=38)

1. Write notes on the following :

(a) MALDI-TOF.

(b ESI-MS.

2. Discuss the following with respect to ^{1}HNMR spectroscopy

(a) Hydrogen bonding in ^{1}H NMR

(b) Tetramethyl silane.

(d) Spin-spin splitting.

3. Write notes on the following:

(a) COSY.

(b) NOE.

4. What is the basic principle of Mossbauer Spectroscopy? Explain with examples.

5. Write notes on the following :

(a) Magnetic resonance Imaging.

(b) Applications of ^{1}H NMR spectroscopy.

SECTION–B

(Short Answer Type Questions)

Note : Section 'B' contains Eight (08) short answer type questions of Eight (08) marks each. Learners are required to answer any Four (04) questions only. (4×8=32)

1. Explain chemical and magnetic shift equivalence.

2. Explain anisotropic effects in acetylene and benzene.

3. Discuss the important factors which affect the chemical shift in ^{13}C NMR spectroscopy.

4. Explain DEPT with suitable examples.

5. Define hyperfine interaction in ESR spectroscopy.

6. How will you distinguish between the followings by ^{1}H NMR spectroscopy :

(a) Acetone and Propanal.

(b) Butanol and methyl propyl ether.

7. Explain Mclafferty rearrangement with suitable examples.

8. How will you account for the appearance of prominent peak at m/z 31, 42 and 70 in the mass spectra of n-pentanol.