

S-457

Total Pages : 3

Roll No.

MCH-608

Heterocyclic Compounds and Spectroscopy-III

M.Sc. Chemistry (MSCCH)

4th Semester Examination, 2022 (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.

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. What are heterocyclic compounds? Write a chemical reaction for the preparation of any two heterocyclic compounds containing two heteroatoms.

2. Write a chemical reaction for the preparation of any two heterocyclic compounds containing four heteroatoms.
3. Discuss the structure and aromaticity of Furan.
4. Write brief notes on the following :
 - (a) Spin-spin coupling.
 - (b) Coupling constant.
 - (c) Chemical shift.
5. Write any four chemical reactions for the synthesis of oxetanes.

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. What do you know about magnetically non-equivalent protons?
2. Write a short note on Optical Rotatory Dispersion (ORD).

3. An aromatic compound (Molecular mass = 135) gives the following signals in its PMR spectrum :
- (a) Singlet (2.09 δ), 3H
 - (b) A distorted singlet (3.09 δ), 1H
 - (c) A multiplet (7.27 δ), 3H
 - (d) A multiplet (7.75 δ), 2H

Predict the structure of the compound.

- 4. Explain shielding and the deshielding effects with examples.
 - 5. Write a short note on ^{19}F -NMR and ^{13}C -NMR spectroscopy.
 - 6. Why ^{13}C -NMR have greater chemical shift value (in ppm) in compare to ^1H -NMR, explain.
 - 7. What are the positive and negative Cotton effects?
 - 8. Explain the chemical properties of pyrimidine and xanthine.
-

