

P-89

Total Pages : 4

Roll No.

MCH-608

Heterocyclic Compounds and Spectroscopy-III

M.Sc. Chemistry (MSCCH)

4th 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

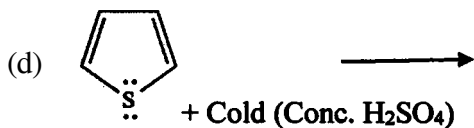
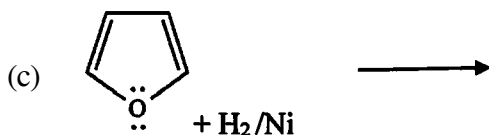
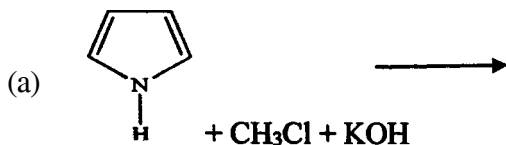
(Long Answer Type Questions)

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. Write a chemical reaction for the synthesis of the followings:
 - (a) Pyrimidine.
 - (b) Purine.
 - (c) Xanthine.

2. Write the principle of NMR spectroscopy and discuss its application.

3. Complete the following reactions :



4. Describe ^{13}C -NMR spectroscopy. What are the extra advantages of proton resonance spectroscopy?

5. What is optical rotation? Explain optical rotation theory.

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)

- How many kinds of ^1H -NMR signals in following :
 - $\text{CH}_3\text{—CH}_2\text{—CH}_3$
 - $\text{CH}_2 = \text{CH}_2$
 - $\text{CH}_3\text{—CH}_2\text{=CH}_2$
 - $\text{C}_6\text{H}_5\text{—CH}_3$
- Describe some important applications of nuclear magnetic resonance (NMR)?
- How many different types of protons are present in allyl bromide molecule?
- Explain why acetylene protons are more shielded than ethylenic protons.
- Write a short note on the Chemical and Physical Properties of Pyrimidine.

6. Write a short note on the Chemical and Physical Properties of Purine.
 7. What is meant by the $(n+1)$ rule in spin-spin coupling?
 8. Write a short note on the use of solvents in the NMR spectrometry?
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