

K-409

Total Pages : 4

Roll No.

MCH-608

HETEROCYCLIC COMPOUNDS AND SPECTROSCOPY-III

M.Sc. Chemistry (MSCCH)

4th 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.

(2×9½=19)

1. Formulate any two methods of synthesis of oxazoles, imidazoles.

2. Formulate a general method of synthesis for each of 1,2,4-triazoles and tetrazoles. What are the products in the following reactions?
 - (a) 1-phenyl-1,2,3-triazole treated with n-BuLi / MeI at -78°C .
 - (b) 1-phenyl-5-amino 1,2,3 triazole is heated.

3. Outline a method of synthesis of the following :
 - (a) Thymine.
 - (b) Adenine.
 - (c) Caffeine.

4. Write any four chemical reactions for the synthesis of oxiranes and also explain two chemical properties of it.

5. Write brief notes on the following :
 - (a) Spin-spin coupling.
 - (b) Coupling constant.
 - (c) Chemical shift.

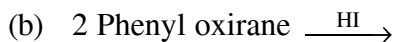
SECTION-B

(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 on ^{19}F -NMR and ^{13}C -NMR spectroscopy.
2. Write a short notes on Continuous wave mode method recording of ^{13}C -NMR spectra.
3. Determine the structure of the following compounds with the use of data provided :
Molecular formula is $\text{C}_4\text{H}_8\text{O}_2$ ^{13}C -NMR data,
 - (i) δ 171.08 (s)
 - (ii) δ 60.44 (+)
 - (iii) δ 21.00 (q)
 - (iv) δ 14.28 (q)
4. Write a short note on applications of Axial α -haloketone rule.
5. What do you know about magnetically non-equivalent protons?

6. What are the products in the following reactions?



7. Write a short note on Claisen rearrangement.

8. Write a short note on Paterno-Buchi reaction.
