QP CODE: 21002178

Reg No : .....

Name : .....

M Sc DEGREE (CSS) EXAMINATION, NOVEMBER 2021

First Semester

CORE - CH500102 - STRUCTURAL AND MOLECULAR ORGANIC CHEMISTRY

M Sc CHEMISTRY, M Sc ANALYTICAL CHEMISTRY, M Sc APPLIED CHEMISTRY , M Sc PHARMACEUTICAL CHEMISTRY, M Sc POLYMER CHEMISTRY

2019 ADMISSION ONWARDS

B70A5B12

Time: 3 Hours Weightage: 30

Part A (Short Answer Questions)

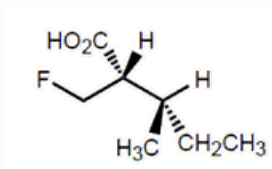
*Answer any **eight** questions.*

*Weight **1** each.*

1. What is sterric hindrance?
2. CH_3 is ortho and para directing towards electrophilic substitution. Explain.
3. Give the mathematical form of Hammet equation and explain the terms.
4. What is photo Fries rearrangement?
5. Arrange the following groups in the ascending order based on the priority on stereogenic center.

   i. $-CH_3$, $-CH_2Cl$, $-CH_2OH$, -CHO ii. $-NH_2$, $-CH=CH_2$, -H, -SH, $-CH(CH_3)_2$, $-CH_2CH_3$

6. In the molecule below, how many stereocenters have an 'S' configuration? Justify.



7. Discuss atropisomerism with an example.
8. The energy barriers in ethyl halides (Et-X) are similar in magnitude irrespective of the size of the halogen. Why?
9. Draw the conformations of adamantane and norbornane.
10. Give the deamination product of *trans*-2-amino cyclohexanol.

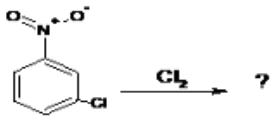
(8×1=8 weightage)

Part B (Short Essay/Problems)

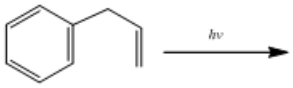
*Answer any **six** questions.*

*Weight **2** each.*

11. Discuss **S_NAr** mechanism.
12. Give a brief account of the mechanism of saponification of esters.
13. Explain the important photochemical reactions of butadiene.
14. What are helical enantiomers? Explain how configurational nomenclature is assigned to these molecules citing appropriate examples.
15. Write a short note on interconversion of geometrical isomers.
16. Explain Curtin Hammett principle.
17. *Predict the product of the given reaction and explain.*



18. Predict the product(s) and explain the mechanism



(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

*Weight **5** each.*

19. a) What are annulenes? How do [10], [14], and [18] annulenes related to the Huckel rule? b) How NMR spectroscopy can be treated as a tool for aromaticity.
20. Explain the various kinetic isotope effects and their significances with suitable examples.
21. Discuss briefly the Norrish Type and Barton reactions.
22. Explain homotopic,enantiotopic and diastereotopic hydrogens with examples and explain how NMR can be used as a tool to differentiate these hydrogens.

(2×5=10 weightage)