QP CODE: 23003254

23003254

Reg No : .....

Name : .....

M Sc DEGREE (CSS) EXAMINATION, APRIL 2023

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

A2BE55D1

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. Cyclooctatetraene is non aromatic, but when it is reduced by alkali metals it become aromatic. Explain.
2. Explain addition–elimination mechanism
3. The value for alkaline hydrolysis of methyl esters of substituted benzoic acids is 2.38, and the rate constant for base catalysed hydrolysis of methyl benzoate is $2\times10^{-4}M^{-1}\ s^{-1}$. Calculate the rate constant for the hydrolysis of methyl m-nitrobenzoate.
4. Explain photoreactions of butadiene
5. What are diastereoisomers? Explain giving the example of 2-bromo-3-chlorobutane.
6. Discuss atropisomerism with an example
7. What are enantiotopic faces? Give an example
8. Draw the conformers of 1,3-dimethyl cyclohexane.
9. Draw the conformations of decalin. Compare the stability.
10. 2-butyl acetate undergoes pyrolytic elimination to form alkenes in cis : trans ratio 1:2. Explain.

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. How NMR spectroscopy is used as a tool for aromaticity?
12. Explain kinetic isotope effects with examples?

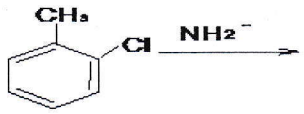
13. Explain the mechanism of photo Fries rearrangement

14. What are helical enantiomers? Explain how configurational nomenclature is assigned to these molecules citing appropriate examples.

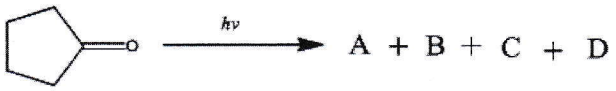
15. Write a short note on interconversion of geometrical isomers.

16. Explain Curtin Hammett principle

17. *Predict the product of the given reaction and suggest a mechanism*



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. What is the effect of substituents on rate and orientation of aromatic substitution reactions?

20. Give a detailed account of different mechanisms of acid and base catalysed hydrolysis of esters with experimental evidences.

21. Explain briefly the photochemical reactions namely, Norrish Type I, Type II and Barton reactions with appropriate examples.

22. a) Briefly explain CIP rule for assigning absolute configuration of chiral molecules taking L- glyceraldehyde as an example.
    b) Determine absolute configurations of chiral centers of D–Erythrose using CIP rule.

(2×5=10 weightage)