QP Code : P24A024

Reg. No : .....
Name : .....

ST MARY'S COLLEGE (AUTONOMOUS), THRISSUR-20

I SEMESTER M.Sc. (CBCSS-PG) DEGREE EXAMINATION, November 2024
M.Sc Chemistry
CHE1C03 : STRUCTURE AND REACTIVTY OF ORGANIC COMPOUNDS
2024 Admission Onwards

Time : 3 Hours **Maximum Weightage : 30**

Part A

*Short answer type questions: Answer **any four** questions. Weightage **2** for each question*

1. Explain the stability of benzylic cations and free radicals. [BTL2]
2. Explain 2-alkyl ketone effect with suitable example. [BTL2]
3. (i) What is meant by enantiomeric excess? How is it determined? [BTL1]
   (ii) The (+) enantiomer of compound A has an optical rotation of 125°. If a pure sample of compound A has an optical rotation of 100°, what is the composition of the sample?
4. Discuss optical activity in cis and trans isomers of 1,2- , 1,3- and 1,4-dimethylcycloheaxanes. [BTL3]
5. Discuss the effect of conformations on S_N1 and S_N2 reactions for axial and equatorial substituent in flexible and rigid systems. [BTL3]
6. Illustrate the use of Evans oxazolidinone as chiral auxiliary in alkylation reaction. [BTL3]
7. Taking appropriate example explain how hydrogen bonding will effect on conformation, physical and chemical properties of organic compounds. [BTL3]

(4x2 = 8 Weightage)

PART B

*Short essay-type questions: Answer **any four** questions. Weightage **3** for each question*

8. What is Marcus theory? What is its significance? [BTL2]
9. Explain the following properties: cross- conjugation, tautomerism and hyperconjugation. [BTL1]
10. Explain the effect of conformation on the course and rate of esterification of isomeric menthols. [BTL4]
11. Explain with example, how hydrogen bonding will affect the conformational stability of a molecule? [BTL3]

Turn Over

12. Compare the difference between flexible and rigid system with suitable example. [BTL5]

13. Illustrate the stereoselective and stereospecific reactions using two examples each. [BTL3]

14. Discuss the stereochemistry in Aldoximes and Ketoximes. [BTL2]

(4x3 = 12 Weightage)

PART C

*Essay-type questions: Answer **any two** questions. Weightage **5** for each question*

15. (a) Give an account on enantiotopic, homotopic and diastereotopic hydrogens. [BTL3]
    (b) Explain the different kinds of chiral molecules with suitable examples.

16. Discuss the stereochemistry of fused, bridged and caged ring systems. [BTL3]

17. (a) Discuss the Asymmetric aldol reaction using Zimmermann Traxler model. [BTL3]
    (b) Discuss the double diastereoselection through matched and mismatched aldols.

(2x5 = 10 Weightage)

< ********** >