D 131270 **(Pages : 2)** **Name.....**

Reg. No.....

FIRST SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2025

(CBCSS)

Chemistry

CHE 1C 03—STRUCTURE AND REACTIVITY OF ORGANIC COMPOUNDS

(2019 Admission onwards)

Time : Three Hours Maximum : 30 Weightage

Section A

Answer any **eight** *questions.*
Each question has 1 *weightage.*

1. Explain LCAO with an example.
2. Depict the structure of the tautomer of benzophenone oxime.
3. Is pyrrole aromatic ? Justify your answer with suitable illustration.
4. Depict an example for a non-classical carbocation.
5. Depict the most stable conformer for cis-1 -ethyl-2-methyl cyclohexane.
6. Draw the eclipsed conformer of ethane using sawhorse representation.
7. What is meant by Pitzer strain? Illustrate an example.
8. Draw the structure of (1R, 2R)-1 -bromo-2-chlorocyclobutane.
9. Illustrate an enantiomeric pair of allenes and designate them.
10. Give an example for a stereoselective reaction.

(8 × 1 = 8 weightage)

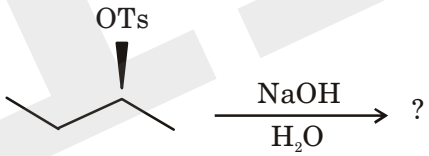
Turn over

Section B

Answer any **six** *questions.*
Each question carries 2 *weightage.*

11. Explain Hammett equation taking the hydrolysis of ethyl benzoate as an example.

12. Illustrate the structure of the product formed from the following reaction :



13. Give examples for molecules containing enantiotopic and diastereotopic hydrogens.

14. N-ethyl-N-methyl nitrone undergoes Cope elimination to yield ethylene. Illustrate.

15. What product is formed by the action of acetate ion on trans-2-acetoxy cyclohexane tosylate and why ?

16. Using Cram's rule, illustrate the product formed when MeMgBr reacts with 2(R)-phenyl-propionaldehyde.

17. Explain helical chirality with an example.

18. Diphenic acid ([1,1′-Biphenyl]-2,2′-dicarboxylic acid) is non-resolvable. Why ?

(6 × 2 = 12 weightage)

Section C

Answer any **two** *questions.*
Each question carries 5 *weightage.*

19. Trans-2-chlorocyclohexanol on treatment with base yields cyclohexane epoxide while the cis isomer yields cyclohexanone. Justify with illustration.

20. Predict the products formed by dihalo elimination of the meso- and dl forms of 2, 3-dibromobutane. What type of reaction is this an example of ?

21. Newman projection is helpful in explaining Hofmann elimination product. How ?

22. Explain Sharpless asymmetric dihydroxylation reaction with an example.

(2 × 5 = 10 weightage)