D 51522 (Pages : 3) Name.....

Reg. No.....

FIRST SEMESTER M.Sc. DEGREE EXAMINATION, NOVEMBER 2018

(CUCSS—PG)

Chemistry

CH 1C 03—STRUCTURE AND REACTIVITY OF ORGANIC COMPOUNDS

(2015 Syllabus Year)

Time : Three Hours Maximum : 36 Weightage

Section A

Answer all **twelve** *questions.*

Each question carries 1 *weightage.*

1. Explain inter and intra molecular hydrogen bonding with suitable examples. How does it effect the volatility of compounds ?
2. Arrange the following in the increasing order of their acidity and comment on it α-chlorobutyric acid, β-chlorobutyric acid, γ-chlorobutyric acid and *n*-butyric acid.
3. How NMR is used as a tool for aromaticity ?
4. Explain the aromatic character of Tropilium ion using Huckel's rule.
5. Which give white precipitate when treated with alcoholic $AgNO_3$ and why-chlorobenzene and benzyl chloride ?
6. What is secondary kinetic effect ?
7. What is meant by ? (a) Chirality ; and (b) Diastereomers ?
8. Mention the factors on which the stability of conformation depends.
9. Draw and explain the stereochemical relation behind the formation of 2-butane from meso and dl-2,3-dibromobutane.
10. What is anomeric effect ? Explain with a suitable example.
11. What is Chiral Pool synthesis ?
12. Explain stereoselectivity and stereospecificity.

(12 × 1 = 12 weightage)

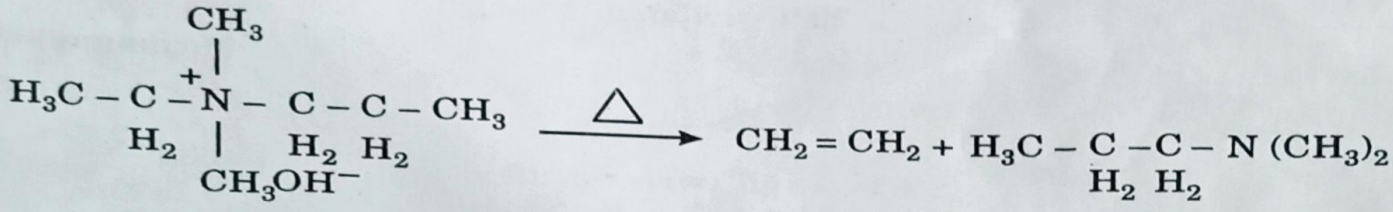
Turn over

Section B

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

13. Draw the energy profile diagram of conformational isomers of cyclohexane. Name the each forms.

14. Predict the products and explain the mechanism of following :—



15. Discuss on asymmetric Diels-Alder reactions.

16. How do mesomeric, hyperconjugative and steric effects influence the strength of organic bases ?

17. Explain with example how NMR used to distinguish enantiotopic/diascoreotopic ligands.

18. Explain Huckel's Rule of Aromaticity.

19. Discuss the conformations of (a) 2-bromocyclohexanone ; and (b) 1,4-cis disubstituted cyclohexanones.

20. Discuss the optical isomerism of biphenyls ?

21. Describe the chiral reagent controlled asymmetric reduction reaction.

22. (a) What are the criteria for aromaticity and antiaromaticity ?

    (b) Represent the molecular orbitals of 1, 3-butadiene and name them.

23. (a) Explain inter and intra molecular hydrogen bonding with suitable examples. How does it effect the volatility of compounds ?

    (b) Why is maleic acid more stronger acid than fumaric acid ?

24. (a) Explain kinetic and thermodynamic control of reactions.

    (b) Explain Curtin - Hammet Principle.

(8 × 2 = 16 weightage)

Section C

Answer any **two** *questions.*
Each question carries 4 *weightage.*

25. Give an account of axial and planar chiral molecules. Explain with suitable examples.

26. (a) What are the criteria for aromaticity and antiaromaticity ?

    (b) Represent the molecular orbitals of 1, 3-butadiene and name them.

27. (a) Discuss S_N1, S_N2 and S_Ni mechanism with suitable example.

    (b) Explain Inductive effect and Hyper conjugation.

28. Explain (a) Asymmetric Aldol condensation by Evans ; and (b) Asymmetric epoxidation using Jacobsen's catalyst.

(2 × 4 = 8 weightage)