21P112 (Pages: 2) Name: .....

Reg.No: .....

FIRST SEMESTER M.Sc. DEGREE EXAMINATION, NOVEMBER 2021

(CBCSS - PG)

(Regular/Supplementary/Improvement)

CC19P CHE1 C03 - STRUCTURE AND REACTIVITY OF ORGANIC COMPOUNDS

(Chemistry)

(2019 Admission onwards)

Time : 3 Hours Maximum : 30 Weightage

Section A

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

1. Distinguish between resonance and tautomerism.
2. Why does cyclopentadiene shows unexpected acidic property?
3. Comment on the optically active conformations of substituted cyclohexane.
4. Explain 3-alkyl ketone effect with suitable example.
5. Menthyl chloride is less susceptible to elimination reactions than neomenthyl chloride.Explain.
6. Write a short note on conformations of norbornanes.
7. Discuss the stereochemistry of biphenyls.
8. Discuss the sterochemistry in Ketoximes
9. Illustrate the use of Evans oxazolidinone as chiral auxiliary in alkylation reaction.
10. How will you prepare E-enolate and Z-enolate for asymmetric aldol reaction?

(8 × 1 = 8 Weightage)

Section B

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

11. State Curtin-Hammett principle. How do you apply this principle in the dehydrochlorination of chlorocyclohexane.
12. Explain Marcus theory and its significance.
13. Explain Taft equation and its advantages over Hammett equation.
14. Discuss the relative rates of esterification of isomeric menthols.

15. (i) What is meant by enantiomeric excess? How is it determined?
    (ii) The (+) enantiomer of compound A has an optical rotation of 125^{o}. If a pure sample of compound A has an optical rotation of 100^{o}, what is the composition of the sample?

16. Mark the Re and Si faces in benzaldehyde and actetaldehyde.

17. What is chiral pool? Illustrate with a suitable example. What is its significance relation in to asymmetric synthesis?

18. Predict the major product obtained when (i) IPCBH2 reacting with (E)-2-butene (ii) IPC2BH reacting with (Z)-2-butene

(6 × 2 = 12 Weightage)

Section C

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

19. (i) Discuss the origin of hydrogen bonding
    (ii) Explain using examples how it affects the properties such as volatility, acidity, basicity, and stability of organic molecules.

20. (a) Explain the factors affecting the conformational stability of molecules with suitable Examples
    (b) Which conformer of Cyclohexane1,3-dicarboxylic acid will yield anhydride easily? Why?

21. (a) Explain the oxidation of the conformers of cyclohexanols by chromic acid.
    (b) Discuss the effect of conformations on pyrolytic elimination.

22. (a) Using Cram's rule predict the major product NaBH4 reduction of (i) (S)-2-phenyl propanaldehyde and (ii) (S)-2-methoxy propanaldehyde.
    (b) Illustrate Zimmermann-Traxler model for aldol reaction.

(2 × 5 = 10 Weightage)

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