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Reg. No. : .....

Name : .....

**Fourth Semester B.Sc. Degree Examination, July 2024**

**First Degree Programme under CBCSS**

**Chemistry**

**Core Course**

**CH 1441 : ORGANIC CHEMISTRY – I**

**(2020 Admission Onwards)**

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer **all** questions. Each question carries **1** mark. Answer in **one** word to maximum of **two** sentences.

1. Give the reason why $CCl_4$ does not possesses dipole moment even though C-Cl bonds are polar.
2. Which are the arrows used for showing the electron movements in reaction mechanism?
3. What is Walden inversion?
4. State Saytzeff rule in elimination reactions.
5. What is meant by dihedral angle?
6. Draw the structures of D and L tartaric acids.
7. What is resolution?

P.T.O.

8. What are pericyclic reactions?

9. Give the structure of methyl orange.

10. What is Friedel Craft's acylation reaction?

**(10 × 1 = 10 Marks)**

## SECTION – B

Short Answer Type (Not to exceed **one** paragraph). Answer any **Eight** questions. Each question carries **2** marks.

11. How will you explain the relative stabilities of carbocations based on hyperconjugation?

12. Differentiate homolysis and heterolysis with one example each.

13. Explain how isotopic labeling is useful to study the benzyne mechanism.

14. What is peroxide effect? Explain with an example.

15. What is Diels-Alder reaction? Give one example.

16. State and explain Baeyer' s strain theory.

17. Explain axis of symmetry with an example.

18. Mention the significance of enantiomeric excess.

19. What are electrocyclic reactions?

20. Give the alkylation and nitration products of naphthalene.

21. Explain the orientation effect of phenol towards electrophilic substitution reactions.

22. What are optical brightners? Mention its uses.

**(8 × 2 = 16 Marks)**

## SECTION – C

Short Essay (Not to exceed **120** words). Answer any **six** questions. Each question carries **4** marks.

23. Differentiate singlet and triplet carbenes.

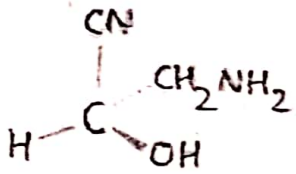
24. Discuss the geometrical isomerism in maleic acid and unsymmetrical ketoximes.

25. What are free radicals? Discuss its structure and important reactions.

26. Explain the term neighbouring group participation with an example.

27. Discuss the Sawhorse and Newman projections of ethane.

28. What is the Cahn–Ingold–Prelog sequence rule? Establish the absolute configuration of the following compound




29. Give the method of synthesis of Malachite green and alizarin dyes.

30. What are Norrish I and Norrish II reactions?

31. Describe the mechanism of nitration and sulphonation reactions of benzene.

**(6 × 4 = 24 Marks)**

## SECTION – D

Long Essay. Answer any **two** questions. **Each** question carries **15** marks.

32. What is Inductive effect? Discuss its types and applications.

33. (a) Discuss the mechanism and stereochemistry of $S_N1$ and $S_N2$ reactions. **8**

(b) Explain the effect of nature of substrate and solvent in substitution reactions. **7**

34. (a) Write an essay on various conformations and their relative stabilities of cyclohexane. **8**

(b) What are the various methods of distinguishing geometrical isomers? **7**

35. (a) Write short notes on the classification of dyes based on application. **7**

(b) State Huckel rule. Based on Huckel rule predict the following compounds are aromatic or not. **8**

(i) Naphthalene

(ii) [10] Annulene

(iii) Cyclopentadienyl cation

**(2 × 15 = 30 Marks)**

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