(Pages : 4) **R – 2346**

Reg. No. : .....

Name : .....

Fourth Semester B.Sc. Degree Examination, July 2023

First Degree Programme under CBCSS

Chemistry

Core Course

CH 1441 : ORGANIC CHEMISTRY I

(2017-2019 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

Answer all questions. Each question carries 1 mark.

1. The product formed by the homolytic bond cleavage is ————.
2. What is the hybridization and geometry of the allyl carbanion?
3. Define mesomeric effect.
4. [4 + 2] cycloaddition reactions are taking place under ———— condition.
5. Among –OH, $-NH_2$, $-NO_2$ and –CN, the group showing *meta* directing influence in aromatic electrophilic substitution reactions is ————.
6. Name two reagents used for the *cis*-hydroxylation of alkenes.
7. What is the dihedral angle for an eclipsed conformation?

P.T.O.

8. *Meso* compounds are optically inactive due to ————.

9. Give an example for a photosensitizer ————.

10. The electrophile formed in the nitration reaction is ————.

(10 × 1 = 10 Marks)

SECTION – B

Answer any **eight** questions from the following. Each question carries **2** marks.

11. Arrange CH_3NH_2, $(CH_3)_2NH$ and $(CH_3)_3N$ in the increasing order of basicity. Justify your answer.

12. What are nitrenes? Give two examples.

13. Give an example which illustrates the Saytzeff orientation.

14. Explain Kharash effect with suitable example.

15. What are chromophores? Give an example.

16. Distinguish between the terms enantiomers and diastereomers.

17. What is asymmetric synthesis?

18. Draw the geometrical isomers of 2-butene and name them.

19. Give the method of preparation of fluorescein.

20. What are deactivating groups with regard to aromatic electrophilic substitution? Give two examples.

21. Explain the aromatic nature of phenanthrene.

22. Which is more basic-pyrrole or pyridine? Justify your answer.

(8 × 2 = 16 Marks)

SECTION – C

Answer any **six** questions from the following. Each question carries **4** marks.

23. Explain hyperconjugative effect and compare the stabilities of 1-butene and 2-butene, with this effect.

24. Write a note on carbenes.

25. Explain the term Walden inversion with an example.

26. Explain the photoconversion of benzophenone to benzopinacol.

27. Illustrate Baeyer's strain theory with suitable example.

28. Explain the conformational analysis of n-butane.

29. What is racemic mixture? How does it differ from a meso form? Explain illustratively in respect of the stereoisomerism exhibited by tartaric acid.

30. Explain Norrish type I and Norrish type II reactions.

31. Write the mechanism for the nitration of Benzene.

(6 × 4 = 24 Marks)

SECTION – D

Answer any **two** questions from the following. **Each** question carries 15 marks.

32. Explain the following:
    (a) Steric interaction
    (b) Sigmatropic rearrangement
    (c) 1,3-diaxial interaction

33. (a) What are the different methods of determination of reaction mechanism?
    (b) Write a note on elimination-addition reactions.

34. (a) What do you understand by the conformations of cyclohexane? Compare their relative stabilities.

(b) Discuss the methods for the resolution of racemic mixtures.

35. (a) Briefly explain photosensitization and photoreduction.

(b) Explain the preparation and uses of methyl orange and phenolphthalein.

($2 \times 15 = 30$ Marks)
