

FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION, APRIL 2020

Chemistry

CHE 4B 04—ORGANIC CHEMISTRY—I

Time : Three Hours

Maximum : 80 Marks

Section A (One Word)*Answer all questions.**Each question carries 1 mark.*

1. Homolysis of a bond results in _____.
2. Dimethyl ether and ethyl alcohol are _____ isomers.
3. Represent the functional group of ester.
4. Baeyer's reagent is _____.
5. Give an example for anti-aromatic compounds.
6. Define resonance energy.
7. Number of chiral centers in lactic acid _____.
8. Name the intermediate formed in ozonolysis reaction.
9. Name a carcinogenic polycyclic arene.
10. Hybridization of carbon in carbocation is _____.

(10 × 1 = 10 marks)

Section B (Short Answers)*Answer any ten questions.**Each question carries 2 marks.*

11. Define specific rotation.
12. Represent tartaric acid in Fischer and sawhorse projection.
13. Formic acid is a stronger acid than ethanoic acid. Justify your answer.
14. Discuss Freund reaction for cyclo alkanes.
15. 1-butyne or 2-butyne, which is more acidic ? Justify your answer.

Turn over

16. Differentiate between conformational and configurational isomerism.
17. What are homologues series ? Give an example.
18. Define enantiomers with proper examples.
19. How will you convert ethylene bromide is into ethyne ? Write the reaction.
20. Differentiate between electrophiles and nucleophiles using proper examples.
21. "Tertiary alkyl halide undergo hydrolysis easily than secondary alkyl halide", Why ?
22. Discuss ring flipping using an example of cyclohexane.

(10 × 2 = 20 marks)

Section C

*Answer any five questions.
Each question carries 6 marks.*

23. Give the mechanism of nitration of benzene.
24. What are free radicals ? Discuss the stability of free radicals.
25. Explain any *two* resolution methods for a racemic mixture.
26. Discuss the conformations of n-butane with proper energy profile diagram.
27. Write a note on structure and stability of benzene based on M O concepts.
28. Write a note on Diels-Alder reaction using examples with 1, 3-butadiene.
29. Define Huckel's ($4n + 2$) rule and explain the aromatic character of pyrrole and indole.
30. Discuss Markownikov and Anti-Markownikov addition with mechanism in alkene compounds.

(5 × 6 = 30 marks)

Section D

*Answer any two questions.
Each question carries 10 marks.*

31. (a) Write a brief note on :
 - (1) Oxymercuration reaction.
 - (2) Ozonolysis reaction.
- (b) Discuss Haworth synthesis of naphthalene. (6 + 4 = 10 marks)
32. (a) Discuss the structure, hybridization and classification of carbene intermediate.
- (b) Discuss the mechanism of addition of water into alkene with proper examples.

(6 + 4 = 10 marks)

33. (a) Write a note on Baeyer's strain theory.
- (b) Discuss how resonance energy of benzene calculated from heat of hydrogenation.
- (5 + 5 = 10 marks)
34. (a) Define inductive effect. Give examples for + I and - I groups. And also explain why 2-chlorobutanoic acid is more acidic than 3-chlorobutanoic acid.
- (b) Define Hyperconjugation. How it can be used to compare stability of 1-butene and 2-butene ?

(5 + 5 = 10 marks)

[2 × 10 = 20 marks]