

B.Sc. DEGREE (C.B.C.S.S.) EXAMINATION, OCTOBER 2015**Third Semester****Core Course—FUNDAMENTALS OF ORGANIC CHEMISTRY**

(Common for B.Sc. Chemistry Model I, Model II, B.Sc. Petrochemicals and B.Sc. Chemistry Environment and Water Management)

[2013 Admission onwards]

Time : Three Hours

Maximum : 60 Marks

Part A

*Answer all questions.
Each question carries 1 mark.*

1. Benzoyl chloride is less reactive than acetyl chloride in acylation reaction. Give reaction.
2. Many nucleophiles are anions but BF_4^- is not a nucleophile. Why ?
3. Draw the structural formula of (R)-1-chloro-2 methyl butane.
4. Distinguish between Racemic and Mesoform of Tartaric acid.
5. Phenol is more acidic than cyclohexanol. Why ?
6. Write the structural formula of (E)-2-Bromo 1-chloro 1-fluoroethene.
7. Which of the following compounds have higher pK_a value ? O-cresol or O-chlorophenol. Give reasons for your choice.
8. The dehydrobromination of 2-Bromobutane gives a mixture of 1-Butene and 2-Butene. Identify the major product and explain its preferential formation.

(8 × 1 = 8)

Part B

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

9. Draw the conformations of Methyl Cyclohexane. Which is the more stable conformation ? Give explanation.
10. Explain Partial Asymmetric synthesis.
11. What is Hyperconjugation ? How does it differ from resonance ?
12. Discuss on the optical isomerism in Diphenyls.
13. Give the mechanism of chlorination of Benzene.
14. Draw the structure of Maleic and Fumaric acid and assign E-Z notation.
15. Distinguish between Homolytic and Heterolytic fission with suitable examples.

Turn over

16. Explain Cis- and Trans elimination.
17. Discuss the mechanism involved in free-radical addition by taking the addition of HBr to Propene.
18. Draw the Fischer projection of (R)-2-iodobutane and convert it into Flying Wedge Formula.

(6 × 2 = 12)

Part C

*Answer any four questions.
Each question carries 4 marks.*

19. Discuss briefly on the factors affecting the stability of carbocations.
20. What is Huckel's theory of Aromaticity ? Discuss the Aromaticity of Non-Benzenoid compounds.
21. Outline the directive influence of chlorine in chlorobenzene and —CHO group in Benzaldehyde towards electrophilic substitution. Explain.
22. Outline any three methods used for the resolution of racemic mixture.
23. Give an account on nitration and sulphonation of Naphthalene.
24. Explain the following with suitable examples :
 - (i) Rearrangement reaction.
 - (ii) Steric effects.
 - (iii) Markownikoff's rule.
 - (iv) Saytzeff rule.

(4 × 4 = 16)

Part D

*Answer any two questions.
Each question carries 12 marks.*

25. (a) Discuss the mechanism and stereochemical aspects of SN1 and SN2 reactions.
(b) Discuss the mechanisms of Anionic cationic and free radical polymerisation.
26. (a) Discuss the conformational analysis of Cyclohexane.
(b) What are the main criteria required for a molecule to be optically active ? Explain.
(c) Write a note on geometrical isomerism in Ketoximes.
27. (a) Give an account on the mechanisms involved in aromatic nucleophilic substitution reactions.
(b) Discuss the mechanism in E1 and E2 elimination with examples.
28. (a) Give a short account on different types of Electron displacement effects.
(b) What are Reaction Intermediate discuss with examples.
(c) What are Diastereoisomers ? Illustrate with an example.

(2 × 12 = 24)