E 3848 (Pages : 3) Reg. No.....

Name.....

B.Sc. DEGREE (C.B.C.S.S.) EXAMINATION, OCTOBER 2016

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. How is the mechanism of a nucleophilic substitution reaction is determined by following its stereochemical cause in certain cases ?
2. Write the structural formula of (E) – 2 – Bromol –1– Chloro –1–Fluoroethene.
3. Draw the structure of Tert-Butyl carbonium in and explain its stability.
4. Meso Tartaric acid is optically inactive. Give reason.
5. Draw the Sawhorse projection formula of staggered and Eclipsed conformations of Ethane.
6. Explain condensation polymerisation with an example.
7. What is heterolysis ? Write the products of heterolysis of Tert-Butyl Chloride.
8. What is Resonance ? Illustrate.

(8 × 1 = 8)

Part B

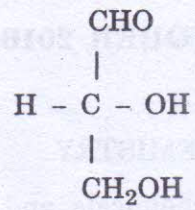
Answer any **six** *questions.*

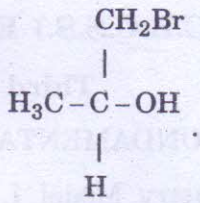
Each question carries 2 *marks.*

9. How does Steric effects influence Alephatic nucleophilic substitution reaction, explain ?
10. State and explain Markowmikoff's rule.

Turn over

11. Analyze (R) and (S) configuration for the following compounds :

(a)


(b)


12. Rationalise (a) It is difficult to nitrate Benzoic acid ; (b) 2, 4, 6–denitrochlorobenzoic acid is easily hydrolysed by dil alkali.

13. Differentiate between Enantiomers and Diastereomers with suitable examples.

14. Define Inductive effect. Based on this arrange the following compounds in the decreasing order of Acid strength. Give reason CH_3COOH ; CH_3CH_2COOH ; $Cl–CH_2COOH$; $ClCH_2 - CH_2 - COOH$.

15. State and explain Hoflman's rule.

16. $– NH_2$ group in Aniline is O and P directing whereas $–NO_2Gr$ in Nitrobenzene is meter directing explain giving reasons.

17. What is mesomeric effect ? Explain.

18. Primary secondary tertiary free radicle. Give the order stability. Give reason for your answer.

(6 × 2 = 12)

Part C

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

19. What are the important criteria required for a molecule to show optical activity ? Discuss.

20. Write a note on reaction intermediates and their stabilities.

21. Discuss the optical isomerism of Lactic acid. Draw the pictures of different isomers.

22. Discuss the mechanism of :

    (a) Sulphonation of Benzene.

    (b) Chlorination of Benzene in presence of Anhydrous $AlCl_3$.

23. Discuss the Aromaticity of Non-Benzenoid compounds.

24. Draw the different conformers of Cyclohexane, and discuss on their relative stability.

(4 × 4 = 16)

Part D

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

25. (a) Discuss on :

    (i) Optical isomerism of compounds without asymmetric Carbon atoms.

    (ii) Geometric isomerism.

    (b) What is Resolution ? Describe any three methods used for Resolution.

26. (a) Write briefly on structure and stability of Naphthalene.

    (b) Discuss the reactivity of Naphthalene towards Electrophilic displacement.

    (c) Discuss Br molecular displacement mechanism of Aromatic Nucleophilic substitution.

27. (a) Discuss the conformational analysis of *n*-Butane.

    (b) What is Asymmetric synthesis ? Discuss the methods of Asymmetric synthesis.

    (c) Distinguish between SN1 and SN2 mechanisms.

28. (a) What is E2 Elimination ? Discuss the mechanism of E2 elimination. What are the Factors influences E2 elimination.

    (b) Discuss the mechanisms involved in Cationic and anionic polymerisation.

    (c) Explain Hyper conjugative effect.

$(2 \times 12 = 24)$