E 1963 (Pages : 2) Reg. No.....

Name.....

B.Sc. DEGREE (C.B.C.S.S.) EXAMINATION, OCTOBER 2011

Third Semester

Core Course—FUNDAMENTALS OF ORGANIC CHEMISTRY

(Common for the programmes B.Sc. Chemistry Model I and Model II, B.Sc Petro Chemicals, and B.Sc Chemistry Environment and Water Management)

Time : Three Hours

Maximum Weight : 25

Section A

Answer all questions. Each Bunch of four questions carries a weight of 1.

I. Fill in the blanks.

1 An optically active substance is that ————.

2 IUPAC name of $CH_2OH\ CHOH\ CH_2OH$ is —— ——.

3 The more stable conformation of Ethane is ————.

4 No. of stereoisomers possible for C_4H_8 is ————.

II. 5 Draw the planar representation of meso Tartaric acid

6 Define configuration.

7 What is sigma tropic rearrangement ?

8 What is Hofmann elimination ?

III. 9 What is Claisen rearrangement ?

10 Write the reagent used for eliminating vicinal dihalides.

11 What are the two different types of carbenes ?

12 Draw the Planar structure of Anthracene – 2, 7 disulphonic acid.

IV. 13 Write the product formed when 1, 2 dibromo benzene is nitrated.

14 Complete the reaction $CH_3 - CH_2 - CH_2 - \underset{Br}{\underset{|}{CH_2}} \xrightarrow{alc} KOH$ — ————.

15 $CH_3 - C(CH_3) = CH - CH_3$ is more stable than isomeric $CH_3 - CH_2 - C(CH_3) = CH_2$; this is predicted by ——— —law.

16 Dichloro acetic acid and acetic acid - which is more acidic ?

(4 × 1 = 4)

Turn over

Section B

Answer any **five** *questions.*
Each carries a weightage of 1.

17. What are enantiomers ? Explain with an example.
18. Sulphonation of Naphthalene gives Naphthalene 1 – sulphonic acid at 40°C and Naphthalene 2-. Sulphonic acid at 160°C—explain.
19. Draw the D and L configuration of Glyceraldehyde and identify R - Configuration from there.
20. Which is the preferred conformation of Methyl-Cyclohexane ? Explain your answer.
21. Explain the stability of carbanions.
22. What is Hückel's theory of Aromaticity ? Use this to predict whether Cyclo pentadienyl cation is aromatic or not ?
23. Discuss the effect of $-CH_3Gr$ and NO_2 Groups in Nucleophilic aromatic substitution.
24. Explain the mechanism of Friedel Craft alkylation.

(5 × 1 – 5)

Section C

Answer any **four** *questions.*
Each carries a weight of 2.

25. Hydrolysis of tert-Butyl chloride occurs with racemization while that of ethyl chloride occurs with inversion of configuration—explain.
26. Explain the optical activity of Biphenyls.
27. What is Resolution ? Explain one biochemical and one chemical method used for the resolution of racemic mixture.
28. Describe the pi bonding in Benzene on the basis of valence bond and molecular orbital theory.
29. Explain the different classes of Pericyclic reactions with examples.
30. Discuss benzyne mechanism of Aromatic nucleophilic substitution.

(4 × 2 = 8)

Section D

Answer any **two** *questions.*
Each carries a weight of 4.

31. Discuss the mechanism of nitration of chlorobenzene and predict the position of the incoming Nitro group.
32. What is conformational Isomerism. Draw the Newmann projection for different conformations possible for *n*-Butane ? Give the conformational analysis of Butane.
33. Discuss the mechanism of addition of HBr to propene in the presence and absence of peroxide ? Also explain the rules involved in it.

(2 × 4 = 8)