2024

Time :As in Programme

Full Marks : 100

The figures in the right-hand margin indicate marks.

*Answer **all** questions.*

PART-I

1. Answer all the following Questions. 1x10

   a. Which out of CH_3- and C_2H_5- group has more +I effect?

   b. Chloroacetic acid is _____ acidic than fluoroacetic acid. (more/less)

   c. The shape of carbanion is _____.

   d. Which out of *cis*- and *trans*- isomers is more stable?

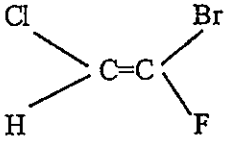
   e. Which of the following groups has the highest priority according to the Cahn-Ingold-Prelog sequence rules?

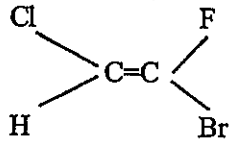
   (i) $C \equiv CH$ (ii) $CH=CH_2$

   (iii) $CH(OH)CH_3$ (iv) CH_2CH_2OH

   f. Which of the following compound has E configuration?

   (i)



(ii) 

g. Ethyl bromide on reaction with alcoholic KOH gives_____.

h. Acetylene is ____ acidic than Ethylene. (more/less)

i. In the sulphonation of benzene, _____ is used as electrophile.

j. Naphthalene is a/an _____compound. (aromatic/non-aromatic/ anti-aromatic)

PART-II

2. Answer all the following questions in maximum 50 words each. 2x9

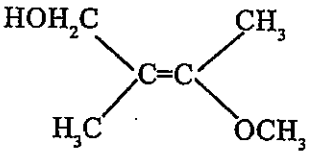
a. Discuss about homolytic and heterolytic bond fission.

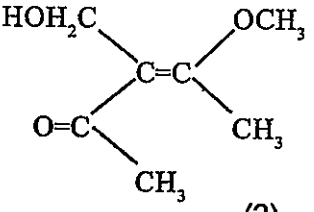
b. With suitable example explain addition and elimination reaction.

c. Write Wurtz reaction.

d. Distinguish between cis and trans isomerism.

e. Assign E or Z configuration to each of the following compound.

(i) 

(ii) 

f. Explain Saytzeff's rule by giving proper example.

g. Explain the hydration reaction of acetylene. Write the product formed by this process.

h. Explain E1CB reaction.

i. Explain chlorination reaction of benzene.

PART-III

3. Answer any eight of the following questions in maximum 250 words each. 5x8

a. State and explain inductive effect.

b. What is hyperconjugation? Explain by giving suitable example.

c. Give a note on Corey-House reactions.

d. Explain racemic mixture and their resolution.

e. Write short notes on enantiomers and diastereomers.

f. With proper mechanism explain Markownikoff's rule.

g. Explain ozonolysis of propylene and propyne.

h. Explain Dials-Alder reaction. What are dienes and dienophiles?

i. Explain Friedel-Craft alkylation and acylation reaction in benzene.

j. Write the halogenation reaction of benzene with proper mechanism.

PART-IV

Answer any four of the following questions (maximum 800 words each) 8x4

4. What is resonance? Write the conditions for resonance. Also explain the relative strength of organic acids and bases.

5. Write the structure, types and relative stabilities of carbocations and carbenes.

6. Discuss the stability and conformational analysis of cycloalkanes.

7. Write the mechanism of (a) oxymercuration-demercuration, (b) hydroboration -oxidation and (c) 1,2-addition reactions in conjugated dienes.

8. What is Huckel's rule of aromaticity? Explain briefly the aromaticity in benzenoid and non-benzenoid compounds.