

2022

Time - 3 hours

Full Marks - 60

Answer all groups as per instructions.

Figures in the right hand margin indicate marks.

GROUP - A

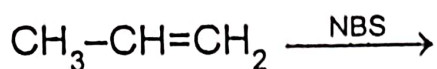
1. Answer all questions and fill in the blanks as required. [1 × 8]
- (a) What is meso compound ? Give an example.
 - (b) Give two examples of ortho and para directing groups.
 - (c) The most stable conformational isomer of cyclohexane is called as _____.
 - (d) What is homolytic fission ?
 - (e) Write the stability order of alkyl free radicals.
 - (f) Which acts as electrophile : carbocation or carbanion ?
 - (g) Write the order of reactivity of halogen acids towards alkenes.
 - (h) Give an example of Nucleophilic addition reaction.

[2]

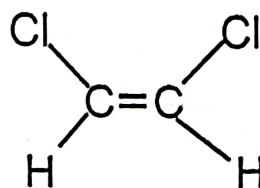
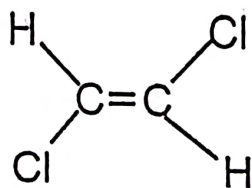
GROUP - B

2. Answer any eight of the following within two or three sentences each. [1½ × 8

(a) Write the product for the following reaction :



- (b) Give an example of anti-Markownikoff's addition reaction.
- (c) State Huckel's rule.
- (d) Which has more melting point and why : cis isomer or trans isomer ?
- (e) What is carbocation ? Give an example.
- (f) What is racemisation ?
- (g) Give an example of SN1 reaction.
- (h) What happens when $\text{CH}_3\text{-Cl}$ reacts with Na metal in presence of dry ether ? Give equation.
- (i) How does benzene react with $\text{CH}_3\text{-Cl}$ in presence of anh. AlCl_3 ? Give equation.
- (j) Assign cis or trans to the following compound.

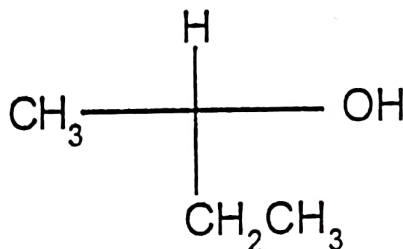
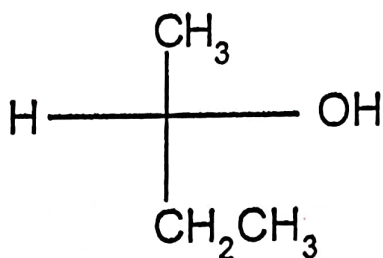


[3]

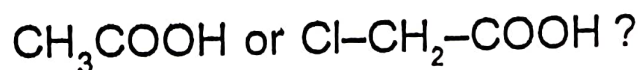
GROUP - C

3. Answer any eight of the following within 75 words each. [2 × 8

- (a) Give two examples of +R groups.
- (b) What happens when ethyne reacts with Cu_2Cl_2 in presence of NH_4OH ? Give equation.
- (c) Find the structure of parent alkene which on ozonolysis yields HCHO and CH_3CHO ? Write the equation.
- (d) Write the hyperconjugation structures of propene.
- (e) Assign R and S notation to the following :



- (f) Which is more acidic and why :



- (g) Explain Saytzeff's rule with an example.
- (h) Draw the most stable and most unstable conformations of cyclohexane.

P.T.O.

[4]

- (i) Discuss the mechanism of chlorination of benzene.
- (j) Explain hydroboration of oxidation reaction with an example.

GROUP - D

Answer any four questions.

- 4. What is carbonium ion and how can it be generated ? Discuss the relative stabilities of primary, secondary and tertiary carbonium ions. [1+1+4]
- 5. Write notes on : [3 × 2]
 - (a) Inductive effect
 - (b) Resonance
- 6. What are the conditions of optical isomerism ? Explain the optical isomerism of tartaric acid. What are enantiomers and diastereomers ? [6]
- 7. Discuss the CIP rules with examples in assigning RS notations. [6]
- 8. (a) Explain the mechanism of Oxymercuration-demercuration of alkenes. [3]
 - (b) Write a note on Diels-Alder reaction. [3]
- 9. Write notes on : [3 × 2]
 - (a) Baeyer's strain theory
 - (b) Conformations of n-butane.

[5]

10. Explain why :

[2 × 3

- (a) Nitration of Toluene takes place more readily than that of benzene.
- (b) $-CHO$ group in benzaldehyde is meta directing.
- (c) $-Cl$ group is ortho-para directing inspite of its $-I$ nature.