

[This question paper contains 7 printed pages]

Your Roll No. :

Sl. No. of Q. Paper : **2199** **IC**

Unique Paper Code : 32171201

Name of the Course : **B.Sc. (Hons.) Chemistry**

Name of the Paper : Organic Chemistry - I

Semester : II

Time : 3 Hours **Maximum Marks : 75**

Instructions for Candidates :

- (a) Write your Roll No. on the top immediately on receipt of this question paper.
- (b) Attempt any **six** questions in **all**.
- (c) Question **No.1** is compulsory.

1. Attempt any **five** questions : 3×5=15

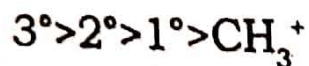
- (a) *cis*-but-2-ene on treating with carbene gives 100% *cis*-1,2-dimethylcyclopropane, sometimes it gives mixture of 50% *cis* and 50% *trans*-1,2-dimethylcyclopropane. Explain this observation.
- (b) Discuss the stereochemical implications of S_{N1} and S_{N2} reaction.

(c) Phenol is more acidic than an alkyl alcohol. Explain.

(d) Write down all the possible conformational isomer of Ethylene glycol. Which conformation is most stable and why ?

(e) Write the structure formula of (S) (E)-2-Bromo-3-heptene.

(f) Explain the order of stability of the following carbocations :

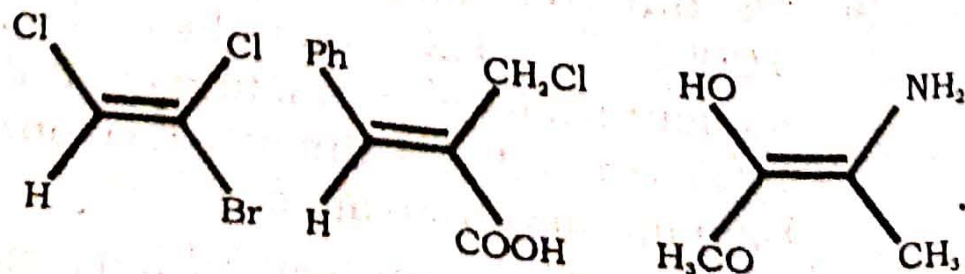


2. (a) Write down all the possible stereoisomer of 1,3-dibromo-2-methylbutane. Assign R/S configuration to each and every chiral center present in each possible stereoisomer.

6

(b) Assign priorities and give E/Z notations to following :

6



3. (a) How many products we will get on dehydration of 3,3-Dimethylbutan-2-ol? Explain with mechanism. 4

(b) 1,3-butadiene on treating with HBr gives 3-Bromobut-1-ene at low temperature whereas at high temperature gives 1-Bromobut-2-ene. Explain this observation. 4

(c) (i) Convert Propane to 2,3-Dimethylbutane.

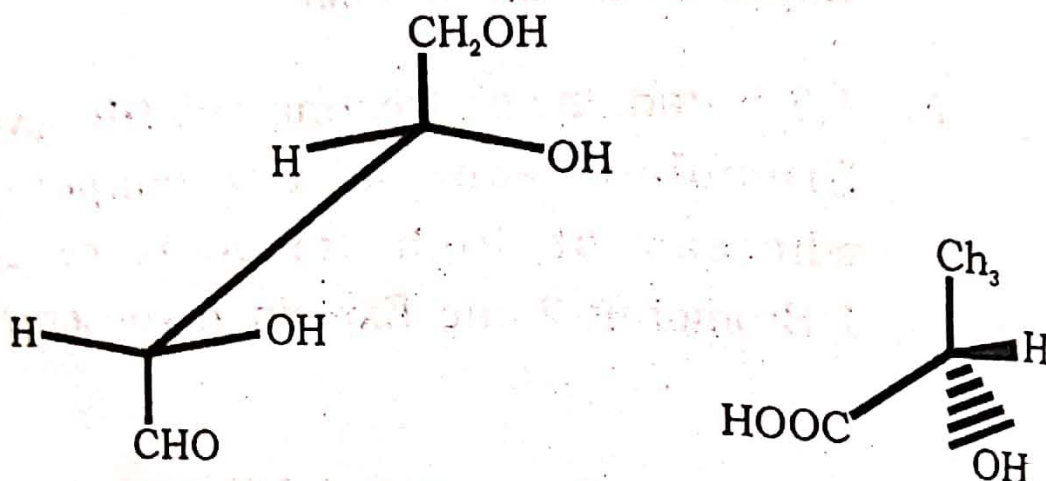
(ii) How is it proved that the chlorination of methane occurs via free radical mechanism? 4

4. (a) Friedel Craft Alkylation of benzene with 1-chlorobutane gives mixture of product. Explain with mechanism. 3

(b) Convert Benzene to 1-chloro-1-phenylethane. 3

(c) Define Huckel's rule and give one example of each with explanation for : Aromatic, Anti-aromatic and Alicyclic compounds. 3

- (d) Write down the standard Fischer Projection for the following : 3



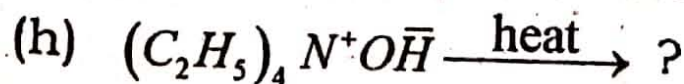
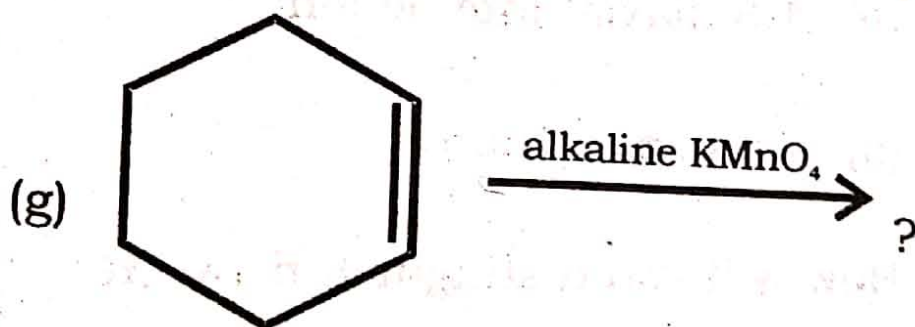
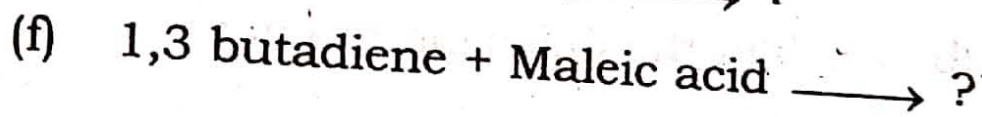
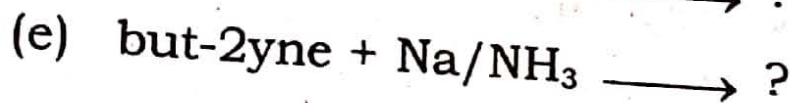
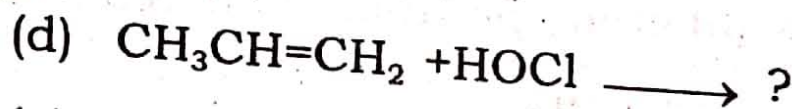
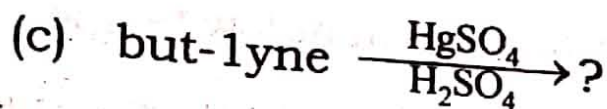
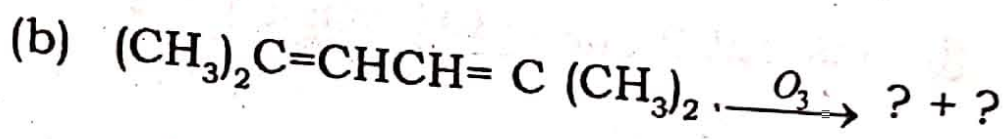
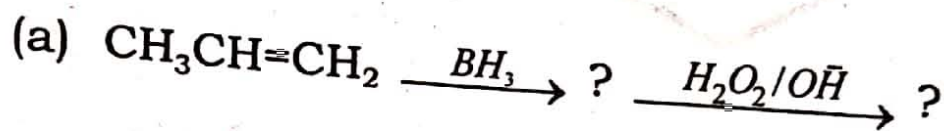
5. (a) Write down all the possible conformational isomers of 1-methylcyclohexane. Which conformer is more stable and why ? 3

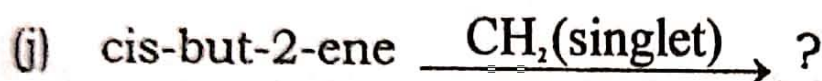
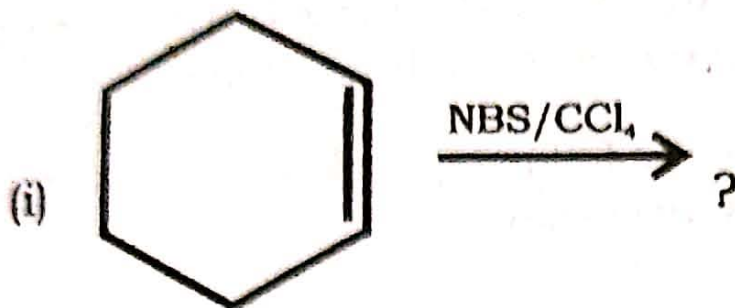
- (b) *cis*-1,4-but-2-ene-dioic acid (maleic acid) on treatment with KMnO_4 (cold) gives a product. Explain the reaction with mechanism. Also give the stereochemistry of the product. 3

- (c) Convert benzene into *m*-nitrobenzoic acid. 3

(d) What are the limitations of Wurtz's reaction? How Corey-House synthesis overcomes these limitations. 3

6. Complete the following and give stereochemistry wherever necessary : 12





7. (a) Propene on bromination at low temperature gives different product than reacting at 500°C. Explain. 4

(b) Explain the following terms : 4

(i) 1,3 diaxial interaction

(ii) Torsional strain

(c) How will you distinguish between : 4

(i) 1-heptyne and 2-heptyne

(ii) But-1-ene and Butane

8. Write a short note on any **three** :

4×3=12

- (a) Saytzeff elimination Vs. Hoffmann elimination
- (b) Hydrogen Bonding
- (c) Types of Elimination reactions
- (d) *Oxymercuration-Demercuration* reaction