(ii) Baeyer's Strain Theory explains the stability of Cycloalkanes

(iii) Substitution Reactions

(iv) Carbenes (5,5,5)

[This question paper contains 8 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 5822 **K**

Unique Paper Code : 2172011102

Name of the Paper : DSC 2-Basic Concepts and Aliphatic Hydrocarbons (Organic Chemistry-1)

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

Semester : I

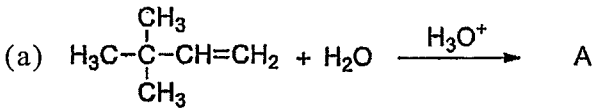
Duration : 3 Hours Maximum Marks : 90

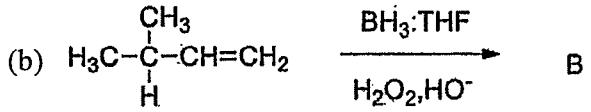
Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **SIX** questions
3. All questions carry **15** marks.
4. This paper contains **8** questions and **4** pages.

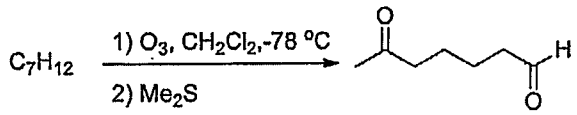
P.T.O.

1. (i) Write the Products with mechanism involved

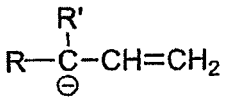
(a) 

(b) 

(ii) (a) Give the structure of unknown alkene with the formula C_7H_{12} that undergoes ozonolysis followed by acidification to yield, only the following product :



(b) Give the structure and hybridisation of following carbanion :



(5,5,5)

(b) Calculate the percentage of isomers formed during the chlorination of n-Butane. The relative reactivity for 1°, 2°, 3° hydrogens are 1, 3.8 and 5, respectively.

(iii) (a) Define electromeric effect with suitable example.

(b) Explain Wurtz reaction and its limitations.

(5,5,5)

7. Explain with Mechanism **(Any three)**

(i) Reaction between Propene and NBS

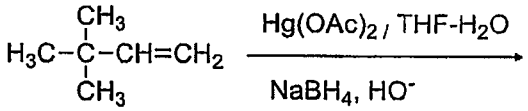
(ii) Addition of HBr to 1,3-buitadiene at -40°C and at 80°C

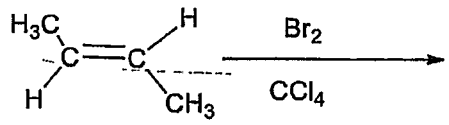
(iii) Hydration of alkynes

(iv) Addition of HBr to propene in presence of peroxide (5,5,5)

8. Write short on the following **(Any three)**

(i) Enantiomer and Diastereomers

iv) 

v) 

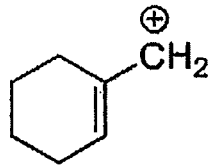
(ii) Why $-NH_2$ group of aniline is ortho, para directing in nature, (10,5)

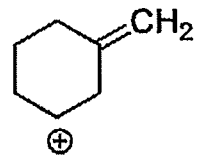
6. (i) (a) Alkenes are more reactive than alkynes towards addition of eiectrophiiic reagents yet when alkynes are treated with one molar equivalent of these same eiectrophiiic reagents it is easy to stop the addition at the alkene stage. This appears to be a paradox and yet it is not. Explain.

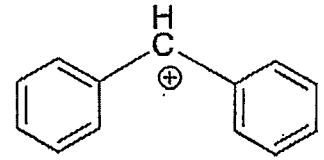
(b) Out of boat and chair conformations of cyclohexane, which is more stable and why?

(ii) (a) Write a chemical method with reaction involved to separate a mixture of 1-Butyne and 2-Butyne.

2. (i) Arrange the following carbocations in increasing order of their reactivity giving suitable reasons:

(a) 

(b) 

(c) 

(ii) Write the mechanism of acid catalysed dehydration of *tert.* Butyl alcohol.

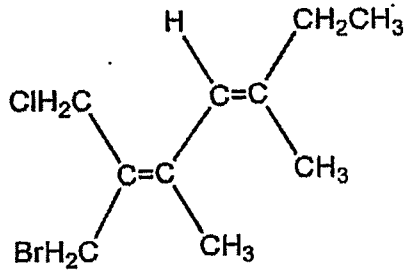
(iii) Define the terms racemic mixture and resolution of racemic mixture. Illustrate the chemical method for the resolution of a racemic mixture with an example. (5,5,5)

P.T.O.

3. (i) Write down the Fischer Projection of all the possible stereoisomers of 3-Bromo-bulan-2-ol. Designate erythro and threo nomenclature to all the stereoisomers and assign absolute configuration (R/S) at each chiral centre.

(ii) (a) Why 2-Chbroacetic acid is more acidic than Acetic acid?

(b) Indicate E/Z configuration to the below given compound :



(iii) Chlorine is more reactive while bromine is more selective in its reaction with Propane. Explain. (5,5,5)

4. (i) Draw different conformations of n-butane and arrange them in order of increasing stability. Give reasons for stability order.

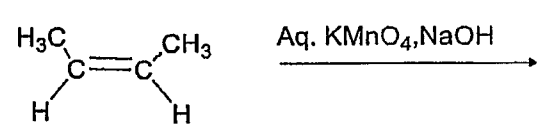
(ii) Explain

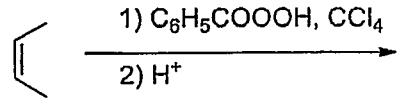
(a) Why *trans*-alkene have higher melting point than their corresponding *cis*-isomer.

(b) Methyl group of toluene is *ortho para* directing in nature.

(iii) What is Hoffinann elimination? How does it differ tom Saytzetf elimination? Give reasons for your answer. (5,5,5)

5. (i) Write the products with and appropriate stereochemistry wherever applicable:

i) 

ii) 

iii)