

[This question paper contains 5 printed pages.]

4718

Your Roll No.

B.Sc.(G) / I

AS

CHEMISTRY – Paper II

(Organic Chemistry)

Time : 2 hours

Maximum Marks : 25

(Write your Roll No. on the top immediately
on receipt of this question paper.)

Attempt any four questions.

1. (a) What is hybridization? What are distinguishing features of sp^3 and sp^2 orbitals?

(b) Indicate the type of hybridization of each carbon atom in the following structures :

(i) CH_3CH_3 (ii) $CH_3C \equiv CCH_3$ (iii) CH_3OH

(c) Give IUPAC systematic name for each of the following :

(i) $CH_3CH = C - CH_2COOH$

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 CH_3

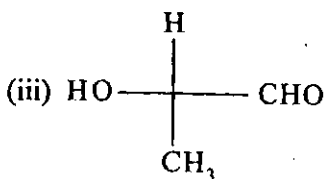
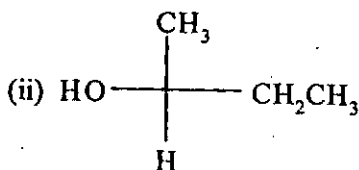
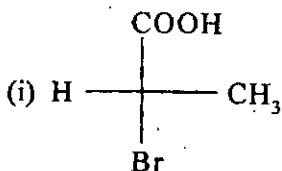
(ii) $CH_3CH - CH_2CH = CH_2$

|
OH

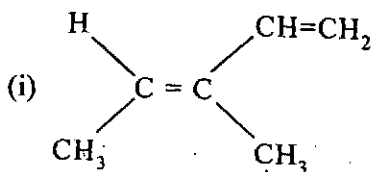
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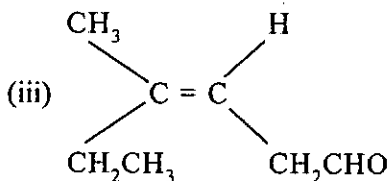
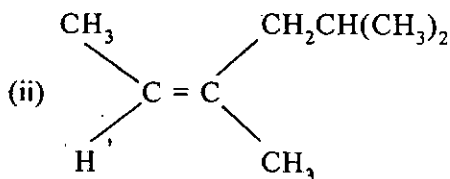
- (d) A sample containing 1.00 gmL^{-1} of optically active substance, in a 1-dm tube, produced a rotation of 3.12° in a clockwise direction, at 25°C and D line of sodium lamp. Calculate the specific rotation?
($2, 1\frac{1}{2}, 1, 1\frac{1}{2}$)

2. (a) Assign R or S configurations to the chirality centers in the following molecules :

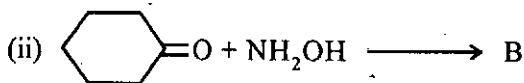
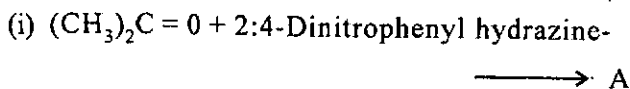


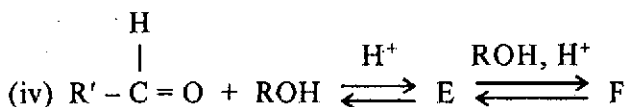
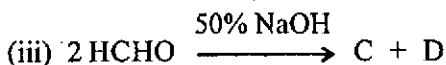
- (b) Assign E or Z configuration to each of the following compounds :





- (c) What are enantiomers and diastereomers? Explain with suitable examples.
- (d) Dehydration of 2-Methyl-2-butanol with acid gives a mixture of two butenes. Write out the chemical equation, state which product predominates and give reasons. (1½, 1½, 2, 2)
3. (a) Give the mechanism and synthesis of Ethyl-2, 2-dimethylpropyl ether, using Williamson's synthesis.
- (b) Identify the products A to F in the following reactions :





- (c) Write down the structure of a carbanion. Discuss about its stability.
- (d) Describe Lucas test to distinguish between primary, secondary and tertiary alcohols.
(1,3,1,1)
4. (a) Write down the basic principle involved in the chromatographic purification of organic compounds.
- (b) (i) Carboxylic acids are much more acidic than the corresponding alcohols. Explain.
(ii) Draw resonance forms of nitromethane.
- (c) Give the mechanism and Kinetics of S_{N}^2 reaction, between methylbromide and hydroxide ion. Write down the order of reactivity of primary, secondary and tertiary alkyl halides.
- (d) (i) Give a method for the preparation of Ethanethiol.
(ii) How can dichlorocarbene be generated?
(1,2,1½,1½)

5. (a) Give the mechanism and preparation of Methylamine using Hofmann's rearrangement.
- (b) (i) Primary aliphatic amines are stronger bases than ammonia. Explain.
- (ii) Discuss the mechanism of Aldol condensation.
- (c) Rank the substances in each of the following groups in order of increasing acidity :
- (i) $\text{CH}_3\text{CH}_2\text{COOH}$, BrCH_2COOH , FCH_2COOH
- (ii) $\text{CH}_3\text{CH}_2\text{OH}$, $\text{CH}_3\text{CH}_2\text{NH}_2$, $\text{CH}_3\text{CH}_2\text{COOH}$
- (d) Write a note on synthetic uses of grignard reagents. (1½,2,1,1½)