Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III • EXAMINATION – WINTER 2013

Subject Code: 133501 **Date: 07-12-2013**

Subject Name: Organic Chemistry for Technologist - I

Time: 02.30 pm - 05.00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** How is Ethanethiol prepared? What happens when, **07**

a. Ethanethiol is treated with aldehyde & ketone in presence of HCl.
b. Hydrogen peroxide react with ethanethiol.
c. Strong oxidizing agent potassium permanganate reacts with ethanethiol.

(b) Write a note on:

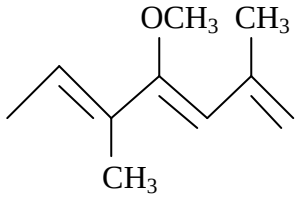
a. Optical isomerism of 2, 3-dibydroxybutanedioicacid. **04**
b. Properties of enantiomer. **03**

Q.2 **(a)** 1. Draw structure corresponding to the following IUPAC names; **03**

a. 3-Cyclopentylbuta-1,3-diene
b. 6-Cyano-3-oxo-4-heptenal
c. 1-Ethoxy-1-propanol

2. Write the IUPAC names for each of the following compounds; **04**

a.



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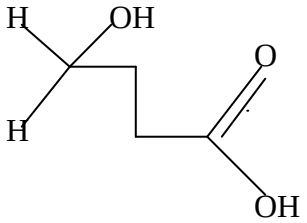

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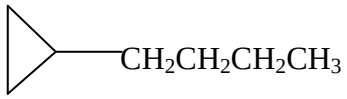

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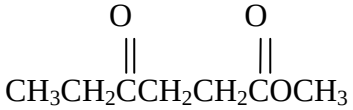


(b) Write a note on: **04**

a. Aldol & Cross aldol reaction. **03**
b. Cannizzaro reaction.

OR

(b) Write the structural formulas and give IUPAC names for all isomeric alcohols of the molecular formula $C_4H_{10}O$. **07**

Q.3 **(a)** Write a structure for each of the following compounds. Explain why the given name is wrong and give a correct name in each case. **07**

a. 1-Methylpentane
b. 2,3-Dichloropropane
c. 3-Bromo-2-methylpropane
d. 2-Ethylbutane
e. 1,1,3-Trimethylpropane

(b) 1. A hydrocarbon of formula C_6H_{12} decolorizes bromine solution, dissolves in concentrated sulfuric acid, yields 2-methylpentane on hydrogenation, and on ozonolysis gives formaldehyde and 3-methylbutanal. What is the structure of hydrocarbon? Give IUPAC name also. **02**

2. Give the general mechanism of electrophilic addition reaction. **05**

OR

Q.3 **(a)** Explain Wurtz synthesis, Corey-house synthesis and Kolbe's synthesis for preparation of Alkane. **07**

(b) 1. How will you synthesize isopropyl alcohol from n-propyl alcohol? **04**

2. How will you distinguish between 1, 3-Butadiene and n-Butane. **03**

Q.4 **(a)** 1. What are Carbonium ions? Arrange the following according to their increasing stability. Explain your answer. **03**

a. $CH_3CH_2CH_2CH_2^+$
b. $(CH_3)_3C^+$
c. $CH_3CH_2(CH_3)CH^+$

2. Explain why benzyl carbonium ion is more stable than ethyl carbonium ion. **04**

(b) Explain Hoffman reaction with mechanism. **07**

OR

Q.4 **(a)** 1. Describe the isomerism exhibited by maleic and fumaric acids. **03**

2. An acid of formula $C_5H_{10}O_2$ is optically active. What is its structure? **02**

3. Explain the term: Electrophile & Nucleophile with suitable example **02**

(b) How are thioethers prepared? Discuss their chemical properties. **07**

Q.5 **(a)** Write only chemical reaction for following conversion:

a. Benzene →Benzaldehyde **04**
b. Benzaldehyde →Benzene **03**

(b) 1. How does primary, secondary and tertiary alcohol differ in their behavior towards oxidation? **05**

2. Which of the following compound show Geometrical isomerism? **02**

a. $CH_3C{=}CCHCH_3$
   | |
   Br Br
b. $(CH_3)_2C{=}C(CH_3)_2$

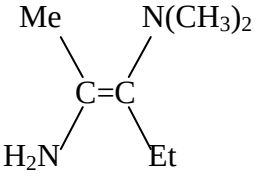
OR

Q.5 **(a)** How does ethyne react with following reagent? **07**

a. $AgNO_3/NH_4OH$
b. $HCN/Ba(CN)_2$
c. HBr
d. Cu_2Cl_2/NH_4OH
e. Na/liq. NH_3
f. H_2/Pd
g. $H_2/Pd/BaSO_4$

(b) 1. Assign E,Z notation to each of the following; **02**

a.



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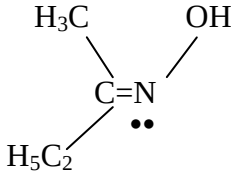
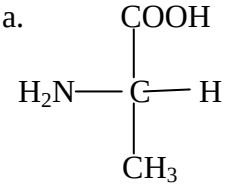


02

2. Assign R,S configuration to each of the following;

a.



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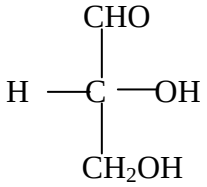

03

3. Which of the following will exhibit optical activity?
   a. Meso-2,3-Dihydroxybutane
   b. Mixture of 1 gm of (+)-erythro-2-bromo-3-chloro butane & 0.5 gm (-)-erythro-2-bromo-3-chloro butane
   c. Mixture of 1 gm of (+)-erythro-2-chloro-3-bromo butane & 1 gm (-) -erythro-2-chloro-3-bromo butane
   d. Racemic mixture of 2-Hydroxy propanoicacid

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