Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III EXAMINATION – WINTER 2015

Subject Code:133501 **Date:02/01/2016**

Subject Name: Organic Chemistry For Technologists – I

Time: 2:30pm to 5:00pm **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)** Write the structural formulas and give IUPAC names for all isomeric alcohols of the molecular formula $C_5H_{12}O$ **07**

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

Q.2 **(a)** 1. What are Carbonium ions? Arrange the following according to their increasing stability. Explain your answer. **04**

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. **03**

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

OR

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

Q.3 **(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) 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-Methylheptane

b. 2,3-Dichloropropane

c. 3-Bromo-2-ethylpentanal

d. 2-Ethylbutane

e. Trimethylpropane

OR

Q.3 **(a)** Draw the structure of following compound and explain which of the following compound show Geometrical Isomerism: **02** **05**

a. 2-methyl-2-butene

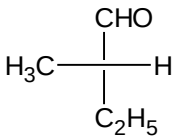
b. 2-pentene

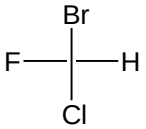
c. 1,2-diiodobutane

d. 2-hexene

(b) (i) Describe ho molytic & heterolytic fission of a covalent bond. How carbocation, carbanion & free radicals are formed. **05**

(ii)Assign R, S configuration to each of the following compound:

(i) 

(ii) 

Q.4 **(a)** Define substitution reaction. Explain free radical substitution reaction with mechanism. **07**

(b) Explain chirality. Write a note on Optical isomerism of 2, 3-dibydroxybutanedioic acid. **05**

OR

Q.4 **(a)** How will you synthesize **07**

1. Acetaldehyde from formaldehyde
2. Acetone from Acetaldehyde

(b) (i) A primary alcohol of formula $C_4H_{10}O$ is optically active, what is its structure? **02**

(ii) A compound with formula $C_3H_8O_2$ has two –OH group & is optically active, what is its structure? **02**

(iii) Explain the term: Electrophile & Nucleophile. **03**

Q.5 **(a)** What happens when, **07**

a. Ethyl iodide is treated with K2S.
b. Diethyl ether is heat with P2S5.
c. Ethanethiol is passing over a mixture of alumina & zinc sulfide at 300ºC.
d. Diethyl sulfide reacts with ethyl bromide.
e. Diethyl ether reacts with bromine.
f. Diethyl sulfide reacts with H2O2 at 20ºC and 100ºC.

(b) 1. How will you synthesize isopropyl alcohol from n-propyl alcohol? **03**

2. How will you distinguish between 1, 3-Butadiene and n-Butane. **04**

OR

Q.5 **(a)** 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 IUPACname also. **05**

2. Give the general mechanism of electrophilic addition reaction. **02**

07

(b) Write only chemical reaction for following conversion:

a. Benzene →Benzaldehyde
b. Benzaldehyde →Benzene

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