Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III • EXAMINATION – WINTER • 2014

Subject Code: 133501 **Date: 01-01-2015**

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)** Write a note on:

a. Cannizzaro reaction **03**

b. Hoffman reaction **04**

(b) What happens when, **07**

a. Ethyl iodide is treated with K_2S.

b. Diethyl ether is heat with P_2S_5.

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 H_2O_2 at 20ºC and 100ºC.

Q.2 **(a)** How is diethyl ether prepared? Explain its chemical properties also. **07**

(b) How does CH≡CH react with the following reagents? **07**

(i) H_2/Pd (ii) H_2/Pd/$BaSO_4$ (iii) HBr

(iv) Cu_2Cl_2/NH_4OH (v) Na/liqNH_3 (vi) $AgNO_3/NH_4OH$

(vii) $HCN/Ba(CN)_2$

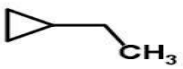
OR

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

Q.3 **(a)** Write the IUPAC names for each of the following compounds; **07**

(i)

(ii)



(iii) $CH_3CH_2COCH_2CHO$ (iv) $(CH_3CH_2)_2CHCN$

(v) $CH_3CH_2COCH_2CH_2COOCH_3$ (vi) $HC{\equiv}CCH_2CH{=}CH_2$

(vii) $HC{\equiv}CCH_2CH{=}CH_2$

(b) (i) How will you synthesize 1-bromopropane from 2-bromopropane? **02**

(ii)Write structural formulas for all alkyl bromides of molecular formula $C_5H_{11}Br$. **05**

OR

Q.3 **(a)** (i) Draw structure corresponding to the following IUPAC names; **04**

a. 1,5-heptadiyne

b. 2-amino-3-hydroxy-4-oxo-pentan-1-oicacid

c. 6-cyano-4-heptenal

d. 1-methyl-1,3-cyclopentadiene

(ii) Give the mechanism for the reaction of methyl bromide with aqueous NaOH to form methyl alcohol. **03**

(b) Define substitution reaction. Explain free radical substitution reaction with mechanism. **07**

Q.4 **(a)** Write a note on:

a. Optical isomerism of 2, 3-dibydroxybutanedioicacid. **04**

b. Stability of Carboniumion. **03**

(b) (i)How will you synthesize acetaldehyde from formaldehyde? **02**

(ii) How will you synthesize acetone from acetaldehyde? **02**

(iii) How will you distinguish between aniline & N- methyl aniline? **03**

OR

Q.4 **(a)** (i) Define Geometrical isomerism. State the necessary condition for a compound to show Geometrical isomerism. Illustrate your answer with examples. **04**

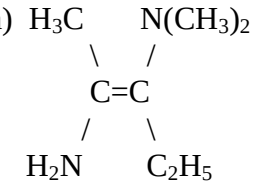
(ii) What is Inductive effect? Give one example of a system where this effect is operative. **03**

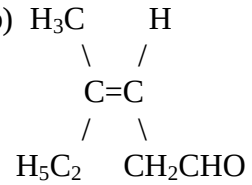
(b) (i) A primary alcohol of formula $C_4H_{10}O$ is optically active, what is its structure? **02**

(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)** (i) What do you undertand by E, Z notation? Assign E or Z configuration to each of the following compound. **03**

(a) 

(b) 

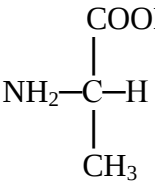
(ii) Give only reaction for following conversion:

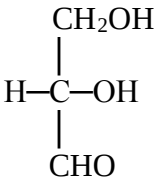
a. Benzene → Aniline **02**

b. Aniline → p-bromo aniline **02**

(b) (i) Describe homolytic & 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: **02**

(a) 

(b) 

OR

Q.5 **(a)** Draw the structure of following compound and explain which of the following compound show Geometrical Isomerism: **07**

a. 2-methyl-2-butene

b. 2-pentene

c. 1,2-diiodobutane

d. 2-hexene

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

****

.