Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III(OLD) • EXAMINATION – WINTER 2016

Subject Code:133501 **Date:02/01/2017**

Subject Name:Organic Chemistry for Technologists-I

Time:10:30 AM to 01:00 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 ethyl mercaptan prepared? How does ethyl mercaptan react with **07**

(a) NaOH (b) $(CH_3COO)_2Pb$ (c) I_2

(d) CH_3CHO (e) H_2O_2 (f) CH_3COCl

(b) Write a note on:

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

b. Optical isomerism of Lactic acid **03**

Q.2 **(a)** Explain:

a. Stability of 1^0, 2^0, 3^0 carbonium ion. **04**

b. Why benzyl carbonium ion is more stable than ethyl carbonium ion. **03**

(b) Discuss the mechanism of SN^1 and SN^2 reaction of alkyl halide. **07**

OR

(b) How are alkanes prepared? Describe their important reaction. **07**

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

(a) $CH_3CH{=}CHCH(CH_3)CH_2C{\equiv}CH$

(b) $CH_3COCH_2COCH_3$

(c) $CH_3C{\equiv}CCH_2CHO$

(d) $CH_3CH_2CH(OCH_3)CH_2COCl$

(e) $CH_3CH(OH)CH_2COOCH_2CH_3$

(f) $CH_3COCH_2CH(CH_3)COOH$

(g) $(CH_3CH_2)_2CHCN$

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

OR

Q.3 **(a)** Draw structure corresponding to the following IUPAC names; **07**

(a) 2-methyl-1,5-hexadiene (b) 2-ethyl-2,2-dimethyl-3-heptene

(c) 1-ethoxy-1-propanol (d) 1-methyl-1,3-cyclopentadiene

(e) 1,5-heptadiyne (f) 2,2,4-trimethyl pentane

(g) 2-methyl-4-nitro-2-pentanol

(b) What is the structure of carbonyl group? How does it react with **07**

(a) HCN (b) $NaHSO_3$ & (c) NH_2OH.

Q.4 **(a)** 1. How does diethyl ether react with following reagents? **07**

(a) O_2/ long contact
(b) Cold Conc. H_2SO_4
(c)PCl_5
2. How does ethyl iodide react with CH_3COOH, Mg, Alcoholic KOH & Na.?

(b) Explain Cannizzaro reaction with mechanism **07**

OR

Q.4 **(a)** How do 1^0, 2^0, 3^0 alcohol differ in their behavior towards oxidation? **07**

(b) 1. How will you distinguish between acetaldehyde and acetone? **04**

2. How will you distinguish between formaldehyde and acetaldehyde? **03**

Q.5 **(a)** Define the term Geometrical Isomerism. State the necessary conditions for a compound to show Geometrical Isomerism. Illustrate your answer with examples. **07**

(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. **04**

2. A compound with formula $C_3H_8O_2$ has two –OH group & is optically active, what is its structure? **03**

OR

Q.5 **(a)** 1. What is Inductive effect? Give one example of a system where this effect is operative. **03**

2. Give the general mechanism of electrophilic addition reaction. **04**

(b) Write only chemical reaction for following conversion:

a. Benzene →Benzaldehyde **04**

b. Benzaldehyde →Benzene **03**

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