Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER–III • EXAMINATION – SUMMER 2013**

**Subject Code: 133501** **Date: 04-06-2013**

**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 diethyl sulfide prepared? How does diethyl sulfide react with, **07**

(a) $CH_3CH_2Br$ (b) $Br_2$

(c) aqueous KOH (d) $H_2O_2$

**(b)** Explain (i) The relative stability of $1^0$, $2^0$, $3^0$ carbonium ion. **07**

(ii) Why benzyl carbonium ion is more stable than ethyl carbonium ion.

**Q.2** **(a)** Write a note on (i) Optical isomerism of Tartaric acid. **07**

(ii) Optical isomerism of Lactic acid.

**(b)** Give two methods for the preparation of propene. What happens when propene is treated with, **07**

(a) $Br_2/CCl_4$ (b) $HBr/H_2O_2$

(c) HOCl (d) $Cl_2/500^oC$

(e) Cold dil. $KMNO_4$

**OR**

**(b)** Write a equation for the preparation of n-butane from, **07**

(a) n-Butyl bromide

(b) Ethyl bromide

(c) 2-Butene

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

**(b)** What happen when acetylene is passed through, **07**

(a) Ammonical silver nitrate solution.

(b) Dil. Sulfuric acid in presence of mercuric sulfate.

(c) Red hot iron tube.

**OR**

**Q.3** **(a)** Write a note on : Aldol and Cross aldol condensation with mechanism **07**

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

**Q.4** **(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)** (i)A hydrocarbon (A) decolorizes dilute KMNO4 solution. (A) react with concentrated sulfuric acid to form an alkyl hydrogen sulfate which on hydrolysis yields 2- Butanol. On ozonolysis (A) gives formaldehyde and propionaldehyde. What is the structural formula of (A)? **07**

(ii) Give the mechanism of electrophilic addition reaction.

**OR**

**Q.4** **(a)** Write the IUPAC names for each of the following compounds; **07**

(a) $CH_3CH_2CH(CH_3)CN$
(b) $CH_2=CHCH_2CH(CH_3)_2$
(c) $CH_3CHCH_2COOH$
ƀ
OH
(d) $CH_3CHCl$ CH
ƀ
$CH_3$
(e)$CH_3CHCH_2CHCH_2COH$
ƀ ƀ ớ
$CH_3$ $NH_2$ O
(f) $CH_3CH=CHCl$ CH
(g) $CH_3COCH_2CH_2OH$

**(b)** (i) A compound with formula $C_3H_8O_2$ has two -OH group and is optically active. What is its structure? **07**
(ii) Explain the term: Electrophile & Nucleophile with suitable example.

**Q.5 (a)** Which of the following will exhibit optical activity? **07**
(a) Meso-2,3-dibromobutane
(b) (+)-2,3-dibromobutane
(c) Mixture of 1 gm of (+)-erythro-2-bromo-3-chloro butane & 0.5 gm (-)-erythro-2-bromo-3-chloro butane
(d) (-)-erythro-2-bromo-3-chloro butane
(e) Mixture of 1 gm of (+)-erythro-2-bromo-3-chloro butane & 1 gm (-) -erythro-2-bromo-3-chloro butane
(f) (-)-2,3-dibromobutane
(g) Recemic mixture of lactic acid

**(b)** Give the general mechanism of nucleophilic addition reaction of carbonyl compounds? **07**

**OR**

**Q.5 (a)** (i)Assign E,Z notation to each of the following **07**
(a)$CH_3$ OH (b) Br Cl
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C=N C=C
ù ù \
C2H5 I H
(ii)Assign R,S configuration to each of the following
(a) Cl (b) OH
ƀ ƀ
Br ----C----H HOOC ---C--- H
ƀ ƀ
H $CH_3$
(iii) Which of the following compound show geometrical isomerism.
(a) $CH_3CH=CH_2$
(b)$CH_3C=CCHCH_3$
ƀ ƀ
Br Br
(c) $CH_3CH_2CH_2CH=CHCH_3$

**(b)** How is ethane thiol prepared? How does ethane thiol react with , **07**
(a) $CH_3COCl$ (b)$I_2$
(c)$CH_3CHO$ (d)$H_2O_2$
(e)$(CH_3COO)_2Pb$ (f)NaOH

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