

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-III (OLD) EXAMINATION – WINTER 2017

Subject Code: 133501
Date: 14/11/2017
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) Write the structural formulas and give IUPAC names for all isomeric alcohols of the molecular formula $C_5H_{12}O$ **07**
- (b) How are alkanes prepared? Give their classification. **07**
- Q.2** (a) How does $CH \equiv CH$ 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) $HCN/Ba(CN)_2$
- (b) What is the structure of carbonyl group? How does it react with;
 a. HCN b. $NaHSO_3$ c. NH_2OH . **07**
- OR**
- (b) How are thioethers prepared? Discuss their chemical properties. **07**
- Q.3** (a) Discuss the mechanism of SN_1 and SN_2 reaction of alkyl halide. **07**
- (b) 1. How does diethyl ether react with the following reagents? **03**
- a. $O_2/long\ contact$
 b. Cold Conc. H_2SO_4
 c. PCl_5
2. A hydrocarbon (A) adds one mole of hydrogen in the presence of a platinum catalyst to form n-Hexane. When (A) is oxidized with hot concentrated $KMnO_4$, a single carboxylic acid containing three carbon is isolated. Give the structure and name of (A). **04**
- OR**
- Q.3** (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. $(CH_3)_3C^+$ **04**
 c. $CH_3CH_2(CH_3)CH^+$
2. Explain why benzyl carbonium ion is more stable than ethyl carbonium ion.
- (b) Write a equation for the preparation of n-butane from, **07**
- a. n-Butyl bromide
 b. Ethyl bromide
 c. 2-Butene
- (a) Write a note on: Oxidation of alcohol. **07**
- Q.4** (b) Give only reaction for following conversion: **07**
- a. n-propyl alcohol \rightarrow Isopropyl alcohol
 b. Isopropyl bromide \rightarrow n-propyl bromide
 c. Isopropyl alcohol \rightarrow Propane

OR



Q.4 (a) Explain Wurtz synthesis, Corey-house synthesis and Kolbe's synthesis for preparation of Alkane. **07**

(b) (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**

Q.5 (a) Draw structure corresponding to the following IUPAC names; **07**

- 2-methyl-1,5-hexadiene
- 2-ethyl-2,2-dimethyl-3-heptene
- 2-amino-3-hydroxy-4-oxopentan-1-oic acid
- 1-methyl-1,3-cyclopentadiene
- 1,5-heptadiyne
- 3-chloroprop-1-ene
- 2-methyl-4-nitro-2-pentanol

(b) (i) Describe homolytic & heterolytic fission of a covalent bond. How carbocation, carbanion & free radicals are formed. **03**

(ii) Write a note on Diazotization reaction. **04**

OR

Q.5 (a) Write Physical properties of alcohol with explanation **07**

(b) Write only chemical reaction for following conversion: **07**

- Benzene \rightarrow Benzoic acid
- Benzaldehyde \rightarrow Nitrobenzene
