

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
 a. 2-methyl-1,5-hexadiene
 b. 2-ethyl-2,2-dimethyl-3-heptene
 c. 2-amino-3-hydroxy-4oxopentan-1-oicacid
 d. 1-methyl-1,3-cyclopentadiene
 e. 1,5-heptadiyne
 f. 3-chloroprop-1-ene
 g. 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
 a. Benzene \rightarrow Benzoic acid
 b. Benzaldehyde \rightarrow Nitrobenzene

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