



THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

A. M. E. C. E. A

MAIN EXAMINATION

MAY – JULY 2016 TRIMESTER

FACULTY OF SCIENCE

DEPARTMENT OF CHEMISTRY

REGULAR PROGRAMME

CHEM 101: ORGANIC CHEMISTRY I

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Date: JULY 2016

Duration: 2 Hours

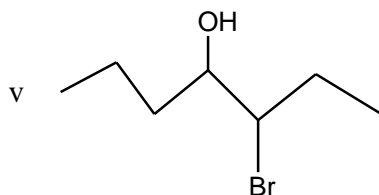
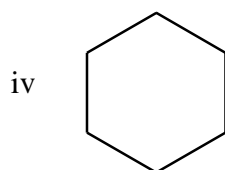
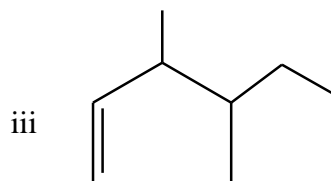
INSTRUCTIONS: Answer Question ONE and ANY OTHER TWO Questions

Q1. a) Draw the structures of the following compounds

- i 2 – Methylpent – 2- ene
- ii Butan - 2- one
- iii Cis – 3 – hexene
- iv Propanoic acid
- v Butylethanoate
- vi I – iodocyclohexene
- vii I – butyne

(7 marks)

b) Name the following compounds



(5 marks)

- c) A compound Y contains 62.1% carbon, 10.3% Hydrogen and the rest is oxygen.

i Calculate the empirical formula of Y **(3 marks)**

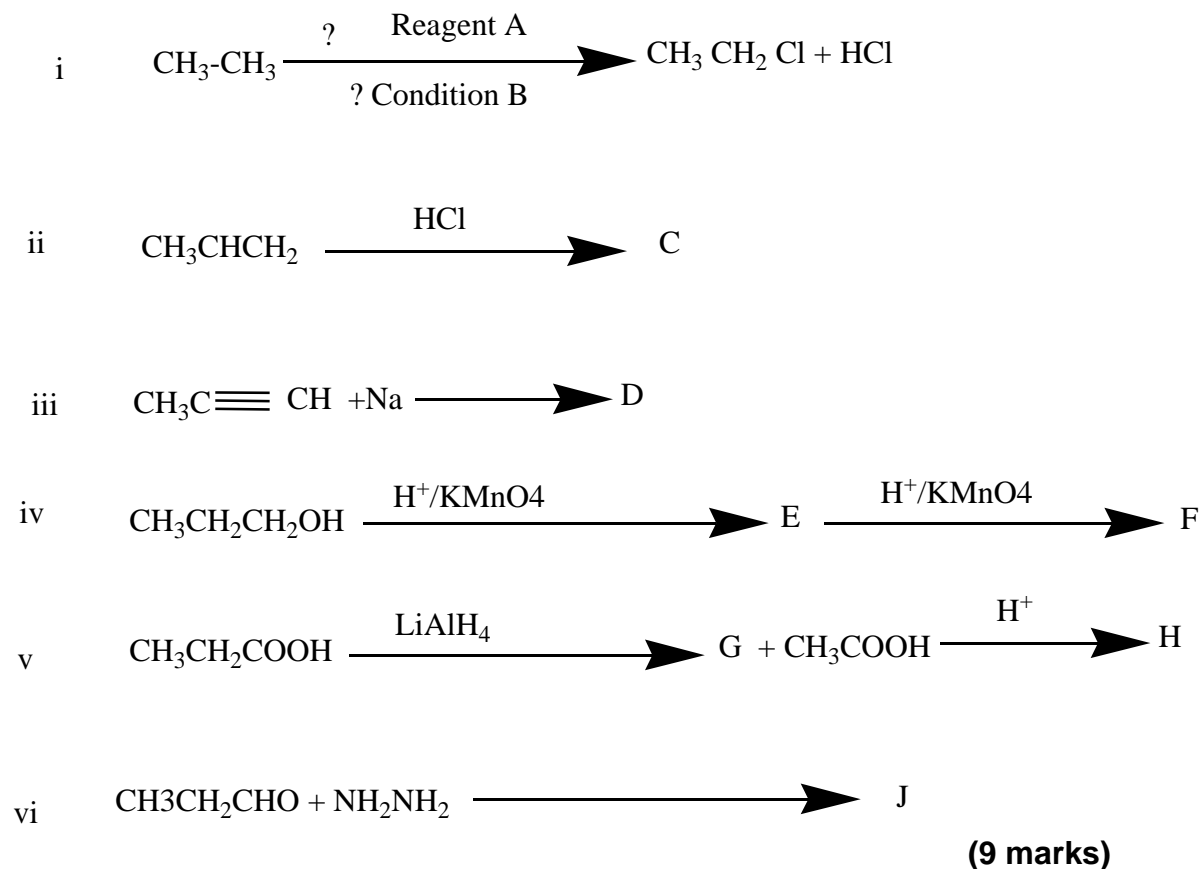
ii Given that Y has a molecular mass of 116, determine the molecular formula of Y (C = 12.0, H = 1.0, O = 16.0) **(1 mark)**

- d) Explain why;

i The melting point of 2,2-dimethyl butane is 98°C while that of 2,3-dimethylbutane is -219°C (2 marks)

- ii Propan-1-ol boils at 97°C and 1-aminopropane boils at 49°C although both compounds have almost the same molecular masses. **(1 mark)**

e) Complete the following equations by writing the missing structures, reagents or conditions labeled A to J.



Q2. a) Describe the bonding in Ethane in terms of S and P hybridization.

(6 marks)

b) Discuss the physical and chemical properties of alkenes. **(14 marks)**

Q3. Discuss the classification, physical properties and chemical properties of

i Alcohols **(10 marks)**

ii Alkyl halides **(10 marks)**

- Q4. a) Draw and name the possible isomers of organic compounds having a molecular formula of C_4H_8O . (The structures should have different functional groups) **(6 marks)**
- b) Discuss the chemistry of aldehydes and Ketones. **(14 marks)**
- Q5. a) Explain how alkanes are obtained from their natural source on large scale. **(6 marks)**
- b) Discuss the chemistry of
- i Alkynes
 - ii Carboxylic acids
- (14 marks)**

END