



**TECHNICAL UNIVERSITY OF MOMBASA**

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FACULTY OF APPLIED AND HEALTH SCIENCES  
DEPARTMENT OF PURE & APPLIED SCIENCES

**UNIVERSITY EXAMINATION FOR:**  
**DIPLOMA IN ANALYTICAL CHEMISTRY**  
**DAC 15S**  
**ACH 2107: ORGANIC CHEMISTRY I**  
**END OF SEMESTER EXAMINATION**  
**SERIES: APRIL 2016**  
**TIME: 2 HOURS**

**DATE:** Pick Date Select Month Pick Year

**Instructions to Candidates**

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other TWO questions.

**Do not write on the question paper.**

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**Question ONE**

- (a) Draw and name the structures of all isomers of a compound with the following molecular formulae.  $C_5H_{10}$ . (10marks)
- (b) Define and give one example of.
- (i) a polar molecule. (3marks)
  - (ii) a non polar molecule. (3marks)
  - (iii) a chiral carbon. (2marks)
- (c) (i) Differentiate between cracking and reforming of alkanes. (6marks)
- (ii) Between alkanes and alkenes, which one are used as starting materials for many organic Industrial products and why. (6marks)

## Question TWO

- (a) Draw the structures of the following compounds (6marks).
- (i) 2,3- dibromo cyclobutanone
  - (ii) 3,5-dichloro 1,2-diethyl cyclohexane
  - (iii) 1-bromo 2-ethyl 3-methyl cyclopentane
  - (iv) 1,4-diol cis cyclohexane
  - (v) Trans 1-Chloro 2-methyl cyclopentane
  - (vi) 3 bromo 2methyl cyclopentanol
- (b) Write equations for reaction between any alkyne with ozone, then water and then water.  
Name the two intermediates and the final product. (6marks)
- (c) List three types of intermolecular forces of attraction. (3marks).

## Question THREE

- (a) How would you distinguish between the following pair of compounds in the Laboratory.
- (i) ethene and ethyne . (8marks)
  - (ii) ethane and ethene (4marks)
- (b) In alkenes C=C double bonds are not identical. Explain. (3marks)

## Question FOUR

- a) Briefly discuss the solubility of alkanes in polar and non-polar solvents. (4marks)
- (b) The reaction between  $\text{CH}_4$  and  $\text{Cl}_2$  doesn't proceed in dark light. Explain (4marks)
- (c) Including the formation of the necessary intermediates and products for reaction between  $\text{CH}_4$  and  $\text{Cl}_2$ , write
- (i) Initiation reactions. (2marks)
  - (ii) Propagation reactions. (2marks)
  - (iii) Termination reactions (3marks)

## Question FIVE

- (a) (i) Obtain the type of hybridization that is found in  $\text{CH}_4$  molecules. (3marks)
- (ii) Name and draw the shape of  $\text{CH}_4$  molecule. (1mark)
- (iii) State five main important features of  $\text{SP}^3$  hybrid orbitals. (7 marks)
- (b) Write equation for reaction between
- (i) ethyne and hydrogen in presence of  $\text{Ni}/150^\circ\text{C}$  and name the products (2marks)
  - (ii) ethyne and chlorine in presence of Silicon(v) oxide (2marks)