



# TECHNICAL UNIVERSITY OF MOMBASA

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FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF PURE & APPLIED SCIENCES

**UNIVERSITY EXAMINATION FOR:**

**DIPLOMA IN PHARMACEUTICAL TECHNOLOGY**

**DPT 16S**

ACH 2105 : ORGANIC CHEMISTRY 1

END OF SEMESTER EXAMINATION

**SERIES: DECEMBER 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) Explain three important properties of carbon that enable it to form many stable Compounds. (6marks)
- (b) Explain : (i) How sigma-bond and pi-bonds are formed from S and P orbitals. (4marks)
- (ii) Why Alkanes don't react with ions or polar molecules . (6marks)
- (c) Differentiate between *homolytic* fusion and *heterolytic* fusion. (6marks)
- (d) (i) Draw and name *cis* and *trans* isomers of  $C_2H_2Br_2$  . (4marks)
- (ii) With reason classify them as *polar* and *non polar*. (4marks)

## Question TWO

- (a) Define the following terms: (i) Electronegativity. (ii) Electropositivity. (2marks)
- (b) Draw and name isomeric structures of a compound with 4  $Sp^3$  and 2  $Sp^2$  hybridized carbon atoms. (10marks)
- Only carbon and hydrogen atoms are present in the compound.
- (c) (i) Differentiate between *cracking* and *reforming* of alkanes. (4marks)
- (ii) Give *one* use of reforming of alkanes. (1marks)

## Question THREE

- (a) Draw the structural formulae of the following cycloalkanes.
- (i) 1-ethyl 2-iodo 3-methyl cyclohexane. (2marks)
- (ii) 2-bromo 1-chloro 3-methyl cyclopentane. (2marks)
- (iii) 3-floro 2-methyl cyclopentanone. (2marks)
- (iv) 4-bromo 3-ethyl 2methyl cyclohexanol (2marks)
- (v) 2-methyl butanal (2marks)
- (b) With a specific example in each case, differentiate between the following types of compounds formulae. (i) *Empirical*. (ii) *Molecular*. (iii) *Structural*. (5marks)

## Question FOUR

- (a) Propene reacts with HCl to form two products.
- (i) Draw and name the structural formulae of the products. (4marks)
- (ii) Which *one* of the two products is most stable and why? (4marks)
- (iii) Name this type of reaction. (2marks)
- (b) (i) Define a *racemic mixture*. (2marks)
- (ii) Racemic mixtures do not show *optical activity*. Explain. (3marks)

## Question FIVE

(a)  $\text{CaSO}_4$  forms two types of Crystals, *un hydrous*  $\text{CaSO}_4$  and *hydrated*  $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ . The un hydrous crystal is hard and difficult to cleave while hydrated one is soft and easily cleaved. Explain.

(8marks)

(b) How you would distinguish between the following pair of compounds in the lab.

(i) 1-butyne and 2-butyne.

(4marks)

(ii) Ethyne and Ethene.

(4marks)