



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF PURE & APPLIED SCIENCES

UNIVERSITY EXAMINATION FOR:

DIPLOMA NUTRITION AND DIETETICS

ACH 2107: INTRODUCTION TO ORGANIC CHEMISTRY

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: SEPTEMBER 2018

TIME: 2 HOURS

DATE: Pick Date Sep 2018

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.

Question ONE

- What are hydrocarbons, classify them (4marks)
- State and explain three physical properties of alcohols. (6marks)
- State two protective roles of proteins. (3marks)
- Distinguish between macro nutrients and micro nutrients. State their roles in the human body. (6marks)
- The table below shows the solubility of esters in water.

ester	formula	solubility (g per 100 g of water)
ethyl methanoate	$\text{HCOOCH}_2\text{CH}_3$	10.5
ethyl ethanoate	$\text{CH}_3\text{COOCH}_2\text{CH}_3$	8.7
ethyl propanoate	$\text{CH}_3\text{CH}_2\text{COOCH}_2\text{CH}_3$	1.7

Using the table above explain the trend of the solubility of esters in water. (4marks)

f. Glucose, Fructose and galactose are examples of monosaccharides. State their roles in human nutrition. (3marks)

g. By use of chemical equations, show how the following reactions take place in carboxylic acids

(i). Halogenations reaction (2marks)

(ii). Reduction reaction (2marks)

Question TWO

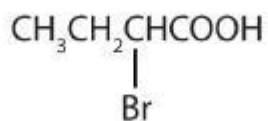
a. Study the table below about the boiling points of some hydrocarbons.

molecule	type	boiling point (°C)
CH ₃ CH ₂ CH ₃	alkane	-42
CH ₃ CHO	aldehyde	+21
CH ₃ CH ₂ OH	alcohol	+78

Explain why alcohol has a high boiling point than alkane and aldehyde. (3marks)

b. Give the common and IUPAC names for each compound below. (4marks)

(i). ClCH₂CH₂CH₂COOH



(ii).

c. Draw the structure for each of the following compound. (6marks)

(i). Heptanoic acid

(ii). 3-methylbutanoic acid

(iii). 2,3-dibromobenzoic acid

d. Which compound has the higher boiling point? (2marks)

CH₃CH₂CH₂OCH₂CH₃ or CH₃CH₂CH₂COOH? Explain.

Question THREE

- a. What are fatty acids? (2marks)
- b. Distinguish between saturated fatty acids and unsaturated fatty acids (4marks)
- c. Draw any two structures of unsaturated fatty acids. (4marks)
- d. State five importances of lipids. (5marks)

Question FOUR

- a. Write brief notes about the following Six Basic Nutrients Required for Good Health:(12marks)
 - i. Carbohydrates
 - ii. Protein
 - iii. Fats
 - iv. Vitamins
 - v. Minerals
 - vi. Water
- b. Explain why nutrition is important (3marks)

Question FIVE

- a. Using chemical equations, show the reaction mechanism of the aldol condensation.(10marks)
- b. State five uses of ketones. (5marks)