TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF PURE & APPLIED SCIENCES

UNIVERSITY EXAMINATION FOR:

DIPLOMA IN NUTRITION AND DIATETICS

ACH 2107: INTRODUCTION TO ORGANIC CHEMISTRY

END OF SEMESTER EXAMINATION

SERIES: AUGUST2019

TIME: 2HOURS –PP1

DATE: Pick DateSelect MonthPick 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. Attemptquestion ONE (Compulsory) and any other TWO questions.

Do not write on the question paper.

QUESTION ONE (30 MARKS)

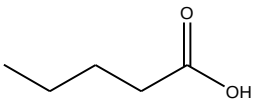
a) Define the following terms as used in organic chemistry

(i) Hydrocarbons **(2 marks)**

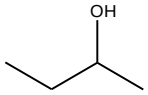
(ii) Essential elements **(2 marks)**

(iii) Functional group **(2 marks)**

b) Use functional groups to identify the classes of the following compounds **(4marks)**



(i)



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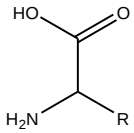

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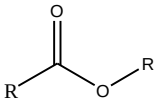


(iv)

c) Distinguish between substitution and elimination reactions as used in organic chemistry **(4 marks)**

d) Describe any FOUR biomolecules **(8 marks)**

e) Explain the roles of the following essential elements in a diet

(i) Sodium (**2marks**)

(ii) Oxygen **(2marks)**

f) State whether the organic compounds will undergo addition or substitution when reacted with halogens. Explain your answer.

(i) Propyne **(2marks)**

(ii) Methane **(2mark)**

QUESTION TWO (15 MARKS)

a) Draw the general structures the following classes of organic compound showing the functional groups:

(i) Carboxylic acid **(2.5 marks)**

(ii) Esters **(2.5 marks)**

b) Describe simple visual test carried to distinguish between the following pair of organic compounds

(i) Hexane and hexene **(3 marks)**

(ii) Aldehydes and Ketones **(3 marks)**

c) Write the equation for each reaction below

(i) $CH_3CH=CH_2$ with H_2 **(2marks)**

(ii) Sucrose ($C_{12}H_{22}O_{11}$) with O_2 **(2marks)**

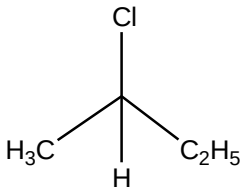
QUESTION THREE (15 MARKS)

a) Define the following terms

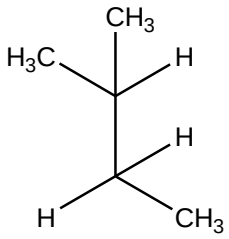
(i) Isomers **(2 marks)**

(ii) Chiral center **(2 marks)**

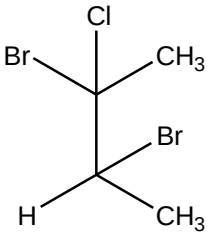
b) Use the compounds **A- C** to answer the questions that follow



A



B



C

(i) State the number of chiral centers in the compound **A-C** **(3marks)**

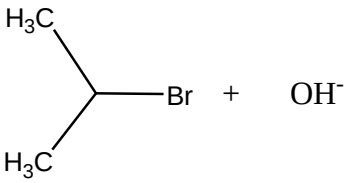
(ii) Give the correct IUPAC names of the compounds **A-C** above **(6 marks)**

c) Name two simple sugars which are isomers **(2 marks)**

QUESTION FOUR (15 MARKS)

a) Distinguish between an electrophile and a nucleophile **(4 marks)**

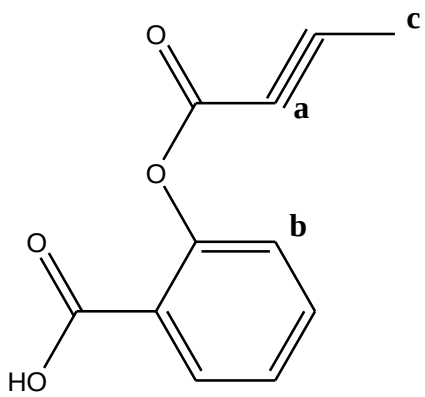
b) Draw and name the substitution and elimination products when 2-bromo-2-methyl propane is reacted with NaOH **(5 marks)**



c) Compound **D (C_4H_8O)** has isomers, one of the isomers of **D** gives a positive test (iodine in aq. NaOH) to give compounds **E** and **F**. Identify compounds **D, E** and **F** **(6 marks)**

QUESTION FIVE (15 MARKS)

a) Given the following **Compound G**:



Compound G

(i) Write the molecular formula of **Compound G** ` **(2 marks)**

(ii) Determine the molecular mass of the compound (C = 12, H = 1, O =16) **(4 marks)**

(iii) State the type of hybridization present on the carbon labeled **a, b** and **c**. **(3 marks)**

(iv) Identify and label all the functional groups in **Compound G**. **(6 marks)**