KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS
2020/2021 ACADEMIC YEAR

SECOND YEAR SECOND SEMESTER
SUPLEMETARY EXAMINATIONS

FOR THE DEGREE OF BSC (CHEMISTRY)

COURSE CODE: SCH 223

COURSE TITLE: BIOCHEMISTRY

DURATION: 2 HOURS

DATE: 18/1/2022 **TIME: 8-10AM**

INSTRUCTIONS TO CANDIDATES

- Answer **QUESTION ONE** (Compulsory) and any other two (2) Questions.
- Indicate **answered questions** on the front cover.
- Start every question on a new page and make sure question's number is written on each page.

This paper consists of **3** printed pages. Please Turn Over

KIBU observes ZERO tolerance to examination cheating

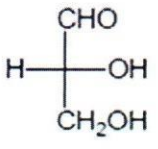
QUESTION ONE [30 MARKS]

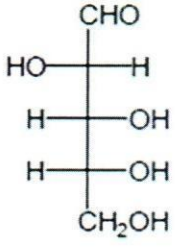
a) Define the following terms **(5 marks)**

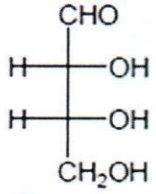
i) Carbohydrates ii) Anomers iii) Enantiomers iv) Oligosaccharides v) Ketoses

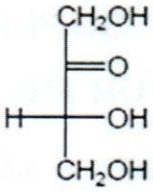
b) Sketch the structure of L and D glucose. Are the two versions of glucose enantiomers or diastereoisomers? Explain. **(4 marks)**

c) Calculate the number of stereo isomers present for each of the following carbohydrate molecules. **(4 marks)**

i) 

ii) 

iii) 

iv) 

d) i. Outline the similarities between glycogen and cellulose. **(2 marks)**

ii. State their structural differences between glycogen and cellulose. **(3 marks)**

iii. With the aid of a diagram show the differences in ii above **(3 marks)**

e) Giving an example in each case differentiate the following **(6 marks)**

i) Saturated and monounsaturated fatty acids

ii) Polar neutral amino acids and polar acidic amino acids

iii) Oligosaccharides and polysaccharides

f) Describe what happens when milk is converted into curd or yoghurt from your understanding of proteins? **(4 marks)**

QUESTION TWO [20 MARKS]

a) Draw and name four nonpolar amino acids. **(8 marks)**

b) i. State five functions of lipids **(5 marks)**

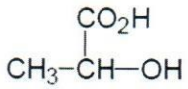
ii. Lipids can be classified in **four** classes namely. **(4 marks)**

iii. Name **three** unsaturated fatty acids **(3 marks)**

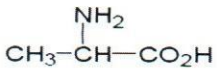
QUESTION THREE [20 MARKS]

a) Draw and name Fischer projections of D and L isomers of the following compounds: **(8 marks)**

i) Lactic acid



ii) Alanine:



b) Differentiate between Isocratic and Gradient elution? **(4 marks)**

c) Discuss the four interactions in protein structure **(8 marks)**

QUESTION FOUR [20 MARKS]

a) Briefly explain the steps followed in an enzymatic catalysis reaction where two substrates (reactants) are converted to one product. **(9 marks)**

b) List the roles of carbohydrates **(8 marks)**

c) State the properties of chiral molecules **(3 marks)**

QUESTION FIVE (20 MARKS)

a) The following proteins can be separated using gel filtration chromatography. Explain the order of elution. **(3 marks)**

b) Explain steps involved in a glycolytic pathway use a diagram aid the explanation **(17 marks)**