KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS
2020/2021 ACADEMIC YEAR

FORTH YEAR FIRST SEMESTER
SPECIAL/SUPPLEMENTARY EXAMINATIONS

FOR THE DEGREE OF BSC (CHEMISTRY)

COURSE CODE: SCH 433E

COURSE TITLE: CHEMISTRY OF CARBOHYDRATES

DATE: 12/1/2022 **TIME: 8-10AM**

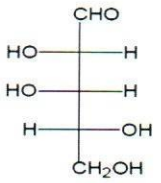
INSTRUCTIONS TO CANDIDATES

- 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.

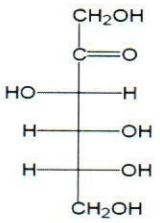
This paper consists of **3** printed pages. Please Turn Over

QUESTION ONE (30 MARKS)

a) Classify the following as D or L isomers, and draw their mirror images **(3 marks)**

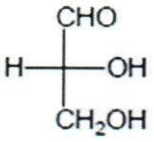


lyxose

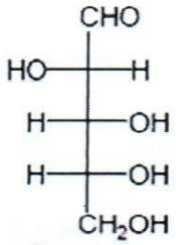


fructose

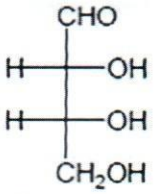
b) Calculate the number of stereo isomers present for each of the following carbohydrate molecules.

i) 

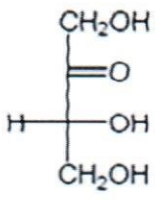
(2 marks)

ii) 

(2 marks)

iii) 

(2 marks)

iv) 

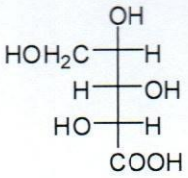
(2 marks)

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

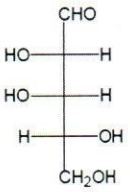
i) Carbohydrates ii) Enantiomers iii) Ketoses iv) Oligosaccharides v) Anomers

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

e) Determine whether the carbohydrate derivative has a D or L configuration **(5 marks)**



f) Study the carbohydrate below and answer the questions that follow.



i) Identify whether compound is a D or L isomer. **(1 mark)**

ii) Draw mirror image of the compound and name it as D or L isomer **(1 mark)**

iii) How many isomers will the compound above have? **(2 marks)**

iv) Which direction will the mirror image rotate plane polarised light? Explain **(2 marks)**

QUESTION TWO (20 MARKS)

a i) Outline the similarities between amylose and amylopectin. **(3 marks)**

ii) State the structural differences with the aid of a diagram show this concept. **(7 marks)**

b) Discuss at the chemical properties of monosaccharides **(10 marks)**

QUESTION THREE (20 MARKS)

a) Discuss digestion and absorption of carbohydrates, including the actions of carbohydrate digestive enzymes **(17 marks)**

b) Differentiate between glycemic response and glycemic index **(2 marks)**

c) State two factors that affect carbohydrate absorption **(1 mark)**

QUESTION FOUR (20 MARKS)

Explain glycogenesis **(20 marks)**

QUESTION FIVE (20 MARKS)

Discuss krebs cycle **(20 marks)**