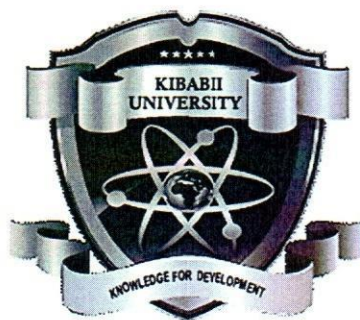


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KIBABII UNIVERSITY

**UNIVERSITY EXAMINATIONS
2020/2021 ACADEMIC YEAR**

**SECOND YEAR SECOND SEMESTER
MAIN EXAMINATIONS**

FOR THE DEGREE OF BSC (CHEMISTRY)

COURSE CODE: SCH 223

COURSE TITLE: BIOCHEMISTRY

DURATION: 2 HOURS

DATE: 4/10/2021

TIME: 8:00-10:00AM

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 4 printed pages. Please Turn Over



KIBU observes ZERO tolerance to examination cheating

QUESTION ONE [30 MARKS]

a) Define the following terms

(5 marks)

i. Carbohydrate ii. Chiral carbon iii. Anomers iv. Anomeric carbon v. Levorotatory substance

b) Name three monosaccharides

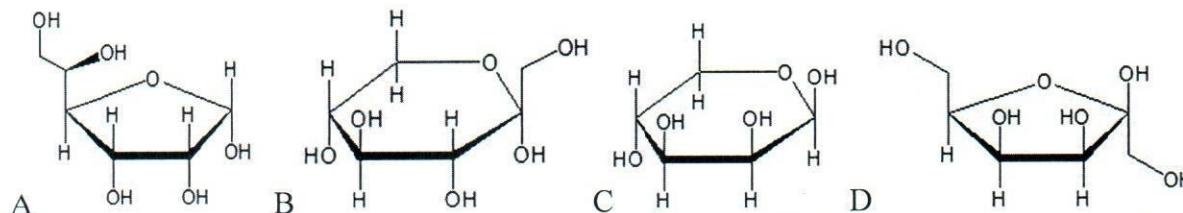
(3 marks)

c) What are the differences between amylose and amylopectin

(6 marks)

d) Study these Haworth projections to answer the following for each of them. Indicate whether they are alpha or beta anomer

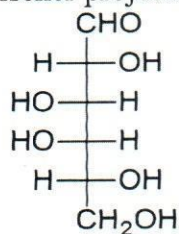
(4 marks)



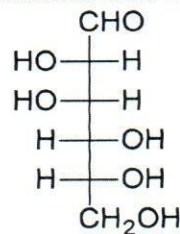
e) Draw and label the Fischer projection of D and L glyceraldehyde.

(4 marks)

f) Study the following Fischer projections to answer the questions below.



galactose



mannose

i. Name the above as D-sugar or an L-sugar

(1 mark)

ii. Sketch and name the mirror images of the sugars above

(4 marks)

iii. Are these two carbohydrates enantiomers? If not, in how many places do they differ? **(2 marks)**

iv. What is the term to describe the relationship between galactose and mannose?

(1 mark)

QUESTION TWO [20 MARKS]

a) Draw and name five polar amino acids

(10 marks)

b) List any four functions of membrane proteins:

(4 marks)

c) Explain the following types of chromatography as used in the separation of proteins **(6 marks)**

i) Reverse phase chromatography:

ii) Hydrophobic interaction chromatography:

QUESTION THREE [20 MARKS]

- a) Explain with the help of diagrams how these bonds differ from each other; a glycosidic bond, peptide bond and a phospho-diester bond (6 marks)
- b) Discuss the chemical properties of monosaccharides (14 marks)

QUESTION FOUR [20 MARKS]

- a) There are three common kinds of polysaccharides, all of which are polymers of glucose. Discuss with reference to their occurrence, structure and their unique differences. (20 marks)

QUESTION FIVE [20 MARKS]

- a) What is an enzymes? (1 mark)
- b) State the properties of enzymes (2 marks)
- c) Enzymes can be put in five broad classes, for each , name the reactions which is catalyzed (3 marks)
- i. Dehydrogenases ii. Tranferases iii. Hydrolases-
- d) Waxes are esters produced by the reaction of fatty acids and alcohols. Name three such common waxes available waxes include their sources (4 marks)
- e) i. Discuss the reactions that lipids undergo (7 marks)
- ii) Name three saturated fatty acids (3 marks)