

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF BACHELOR
OF SCIENCE IN BIOCHEMISTRY

BIOC 202: BIOCHEMISTRY OF CARBOHYDRATES

STREAMS: BSC (BIOCHEM)

TIME: 2 HOURS

DAY/DATE: MONDAY 02/12/2019

2.30 P.M. – 4.30 P.A.M.

INSTRUCTIONS:

- Answer ALL questions
- Do not write on the question paper

QUESTION ONE (30 MARKS)

- (a) Raffinose is a trisaccharide that is widely found in legumes and cruciferous vegetables
- (i) Draw the Haworth projection formula of Raffinose [3 marks]
 - (ii) Explain how it is digested in human gut [5 marks]
 - (iii) Explain major uses of this sugar [3 marks]
- (b) Draw Fisher projections formula for the following sugars:
- (i) D-Galactose
 - (ii) D-Fructose
 - (iii) D-mannose
 - (iv) D-ribulose [8 marks]
- (c) Describe the biological significance of hyaluronic acid [8 marks]
- (d) Explain why corticosteroids and cephalosporins are used to treat rheumatoid arthritis caused by clostridial and streptococcal infections. [4 marks]

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QUESTION TWO (20 MARKS)

- (a) Monosaccharides occur in cyclic form rather than linear form. Using structures show how D-glucose undergoes cyclization to form pyranose rings [5 marks]
- (b) Draw the structures of Lactose and Trehalose [4 marks]
- (c) Describe how the above differ in structure and function [8 marks]

QUESTION THREE (20 MARKS)

- (a) Draw the structures of any two (2) amino sugars and outline their clinical significance [8 marks]
- (b) Describe the structure of Xanthan gum [4 marks]
- (c) Discuss biomedical application of -glucans [8 marks]

QUESTION FOUR (20 MARKS)

Using chemical structures, describe the following types of isomerisms found in monosaccharides

- (a) Diastereoisomerism [6 marks]
- (b) Epimerism [8 marks]
- (c) Anomerism [6 marks]
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