



# TECHNICAL UNIVERSITY OF MOMBASA

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FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF ENVIRONMENT & HEALTH SCIENCES

**UNIVERSITY EXAMINATION FOR:**

**DIPLOMA IN COMMUNITY HEALTH**

**DCHM/17S/YEAR1/SEMESTER 1**

**ABT 2101: STRUCTURES OF BIOMOLECULES**

**SPECIAL/ SUPPLEMENTARY EXAMINATIONS**

**SERIES: SEPTEMBER 2018**

**TIME: 2 HOURS**

***Instructions to Candidates***

This paper consists of FIVE questions

Answer question ONE (COMPULSORY) and any other TWO questions.

***This paper consists of two printed pages.***

***Mobile phones are NOT allowed in the examination room***

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**QUESTION 1**

**(30marks)**

a). Define the following terms

- |                      |         |
|----------------------|---------|
| i. Anomers           | 2 marks |
| ii. Optical activity | 2 marks |
| iii. Rancidity       | 2 marks |
| iv. Ester compound   | 2 marks |

b). i Differentiate homopolysaccharides from heteropolysaccharides. 4 marks

ii. State four physical properties of monosaccharide. 4 marks

c). i. Outline the general structure of amino acids 2marks

ii. Using the structure in b (i) illustrate the formation of a peptide bond 4 marks

iii. State two characteristic of amino acids at isoelectric point 2 marks

- d). i. Using the structure of glycerol and the general formula of fatty acids illustrate the formation of a triglyceride 4 marks
- ii. Differentiate simple glycerides from mixed glycerides 4 marks

**QUESTION 2 (15marks)**

- a). Using the structure of glucose illustrate the formation of a (1,4) glucosidic bond 4 marks
- b). i. Give the chemical structure of amylose and amylopectin components of starch. 5 marks
- ii. Explain the differences between amylose and amylopectin components of starch 6 marks

**QUESTION 3 (15marks)**

- a) Differentiate essential amino acids from non-essential amino acids 5 marks
- b) State the eight essential amino acids 4 marks
- c) Explain the three nutritional classes of proteins and give two examples in each. 6 marks

**QUESTION 4 (15marks)**

- a) Illustrate with diagrams and explain the four structures of proteins 12 marks
- b) Explain why proteins are referred to as nitrogenous compounds 3 marks

**QUESTION 5 (15marks)**

- a) Differentiate between saturated and non-saturated fatty acids and give two examples in each. 6 marks
- b) Explain the classification of carbohydrates 9 marks