



UNIVERSITY OF EMBU

2017/2018 ACADEMIC YEAR

SECOND SEMESTER EXAMINATIONS

FIRST YEAR EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE,
BACHELOR OF SCIENCE (BIOCHEMISTRY) AND BACHELOR OF SCIENCE
(NATURAL RESOURCES AND CONSERVATION MANAGEMENT)

SBC 102: INTRODUCTION TO BIOCHEMISTRY

DATE: APRIL 5, 2018

TIME: 11:00AM-1:00PM

INSTRUCTIONS: Answer any ten (10) questions (7 marks each)

1.

- a) Explain the differences between the following biomolecules
- i) Aldehydes and ketones (2 marks)
 - ii) Nucleotide and Nucleoside (2 marks)
- b) Explain the main functions of proteins (3 marks)

2.

- a) Outline the different levels of protein structures (4 marks)
- b) Describe classification of lipids based on function (3 marks)

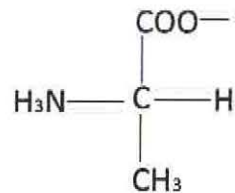
3.

- a) Using the Fischer Projections of erythrose, illustrate the naming of stereoisomers (3 marks)
- b) State the physical properties of monosaccharides (4 marks)

4. Discuss the preparatory/Energy requiring phase of Glycolysis (7 marks)

5.

a) The structure of L-alanine is shown.



i) Define and label the chiral carbon (1 mark)

ii) Draw the structure of D-alanine (2 marks)

b) Outline the key properties of proteins that enable them participate in a wide range of functions (4 marks)

6. Describe giving specific examples the different classes of amino acids based on polarity and charge of the side groups (7 marks)

7. Discuss the classification of lipids based on their structural complexity (7 marks)

8.

a) i) Distinguish between omega-3 and omega-6 fatty acids (2 marks)

ii) Explain the role of fatty acids in diet (2 marks)

b) i) Distinguish between cis and trans configuration of fats (2 marks)

ii) Explain how the conversion of cis fats to trans can be achieved (1 mark)

9.

a) Outline the differences between single stranded DNA and double stranded DNA (4 marks)

b) Describe the role of proteins in the transport of molecules in the body (3 marks)

10.

a) Differentiate between purines and pyrimidines (2 marks)

b) Describe the major features of a DNA molecule (5 marks)

11.

a) Differentiate between palindromes and mirror repeats in DNA (2 marks)

b) Outline the features that result from bending of palindromes and mirror repeats (2 marks)

c) Illustrate the common features of a tRNA molecule (3 marks)

12. Discuss the applications of biochemistry in agriculture and plant science (7 marks)

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