MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FIRST YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (ANALYTICAL CHEMISTRY)

SBC 103: PROTEINS AND ENZYMES

DATE: 11/12/2020 **TIME: 2:00 – 4:00 PM**

INSTRUCTIONS

1. Answer 1 (compulsory) and **any two** questions in Section B.
2. Use clean well labelled diagrams wherever appropriate.

SECTION A: COMPULSORY

QUESTION ONE (30 MARKS)

a) Distingush between a polypeptide and a protein (3 marks)

b) Describe propeties of amino acids (3 marks)

c) Explain the role of metal ions in enzymology (3 marks)

d) Describe the formation of disulphide bond using amino acid structure (3 marks)

e) Explain isomerism of amino acids (3 marks)

f) Describe the structure of the following amino acids

i) Lysine (1.5 marks)

ii) Phenylalanine (1.5 marks)

g) Using a specific example describe Zwitterion (3 marks)

h) Describes the lock and Key hypothesis of enzymatic reactions (3 marks)

i) Explain the meaning of tautomerism using chemical equations (3 marks)

j) Describe the functions of alanine amino transferase (3 marks)

k) Outline two types of inhibitors (3 marks)

SECTION B: ANSWER ANY TWO QUESTIONS (40 MARKS)

QUESTION TWO (20 MARKS)

a) Using hemoglobin as an example discuss the quartenary structure (10 marks)

b) Discuss the Pauling's theory of enzyme's chemical catalytic mechanisms (10 marks)

QUESTION THREE (20 MARKS)

You have been requested by your company to generate a standard curve for the measurement of the enzyme kinetics and function. Discuss how you will go about solving the objectives

QUESTION FOUR (20 MARKS)

Discuss the regulation of an enzyme through Phosphorylation method

QUESTION FIVE (20 MARKS)

Discuss enzymatic inhibitions