



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF PURE & APPLIED SCIENCES

UNIVERSITY EXAMINATION FOR:

BACHELOR OF TECHNOLOGY IN INDUSTRIAL MICROBIOLOGY AND
BIOTECHNOLOGY

ABT 4207: PROTEIN & ENZYME I

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2016

TIME: 2 HOURS

DATE: Pick Date Select Month Pick Year

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other TWO questions.

Do not write on the question paper.

Question ONE

- (a) Define the quaternary protein level structure and give an example. **(2 marks)**
- (b) With examples, outline the classification of enzymes naming by the type of reactions. **(6 marks)**
- (c) Glycine is very important amino acid because it occupies very little space. Outline the importance of Glycine in different polypeptides/ proteins. **(4 marks)**
- (d) Give the systematic names and the first three digit in the E.C classification of the following catalysing the following reaction
- (i) $\text{Glucose} + \text{ATP} \longrightarrow \text{Glucose-6-Phosphate} + \text{ADP}$ **(2 marks)**
- (ii) $\text{Aminoacyl peptide} + \text{H}_2\text{O} \longleftrightarrow \text{Amino acid} + \text{Peptide}$ **(2 marks)**
- (iii) $6\text{-glucose} \longleftrightarrow 6\text{-fructose}$ **(2 marks)**

(e) State two functions of the following co-factors

- (i) Zinc ions (2 marks)
- (ii) Flavin nucleotides (FAD, FMN) (2 marks)
- (iii) Pyridoxal Phosphate (2 marks)
- (iv) Coenzyme A (2 marks)

(f) Name four types of irreversible enzyme inhibitors and their mode of action in enzymes. (4 marks)

Question TWO

Describe the structure and functions of the following proteins

- (a) Keratin (6 marks)
- (b) Collagen (7 marks)
- (c) Myoglobin (7 marks)

Question THREE

- (a) List five characteristic features of an active site of an enzyme. (5 marks)
- (b) Explain various models that have been proposed to explain the substrate specificity of enzymes and Enzyme-Substrate (E-S) complex. (5 marks)
- (c) Explain the mechanism of enzyme catalysis. (10 marks)

Question FOUR

- (a) Describe the steps in the formation of mature collagen fibres. (10 marks)
- (b) Define the following four major rate enhancement processes in mechanism of catalysis in the formation of Enzyme-Substrate
 - (i) Strain or distortion (2 marks)
 - (ii) Covalent catalysis (3 marks)
 - (iii) Acid-base (3 marks)
 - (iv) Proximity (2 marks)

Question FIVE

Describe the features, functions and mode of action that make Penicillin as effective inhibitor. (15 marks)