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 **SPECIAL/ SUPPLEMENTARY PAPER**

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: SEPTEMBER2018

TIME:2HOURS

DATE: Pick DateSep2018

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

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

Do not write on the question paper.

Question ONE

a) Give the systematic names and the first three digit in the E.C classification of the following catalyzing reactions

(i) Glucose + ATP $\longrightarrow$ Glucose-6-Phospahte + ADP **(2 marks)**

(ii) Aminoacyl peptide + H_2O $\longleftrightarrow$ Amino acid + Peptide **(2 marks)**

(iii) 6-glucose $\longleftrightarrow$ 6-fructose **(2 marks)**

(iv) Phosphoenol Pyruvate + ADP $\longrightarrow$ Pyruvate + ATP **(2 mark)**

(v) ATP+ H_2O $\longleftrightarrow$ Orthophosphate + ADP **(2 mark)**

(vi) UDP-Glucose $\longleftrightarrow$ UDP-Galactose **(2 mark)**

b) (i) Define the quaternary protein structure. **(2 marks)**

(ii) Describe two examples of molecules which exist in the above (i) protein structure. **(2 marks)**

c) State two functions of the following co-factors

(i) Pyridoxal Phosphates **(2 marks)**

(ii) Flavin nucleotides (FAD, FMN) **(2 marks)**

(iii) Zinc ions **(2 marks)**

(iv) Coenzyme A **(2 marks)**

d) Give three characteristic types of reversible enzyme inhibitors. **(6 marks)**

Question TWO

a) Describe the structure and steps in the formation of mature collagen fibres. **(4 marks)**

b) Describe the structure and function of the following proteins.

(i) Keratin **(4 marks)**

(ii) Hemoglobin **(4 marks)**

(iii) Myoglobin **(4 marks)**

(iv) Cytochrome **(4 marks)**

Question THREE

(a) Explain various models that have been proposed to explain the substrate specificity of enzymes and Enzyme-Substrate (E-S) complex. **(5 marks)**

(b) Describe with an illustration of graphs to determine different types of inhibitor. **(12 marks)**

(c) Explain three applications of enzyme inhibitors. **(3 marks)**

Question FOUR

a) Explain the mechanism of enzyme catalysis. **(4 marks)**

b) With an illustration of an example, describe the following four major rate enhancement processes in the mechanism of catalysis in the formation of Enzyme-Substrate complex.

(i) Strain or distortion **(4 marks)**

(ii) Covalent catalysis **(4 marks)**

(iii) Acid-base catalysis **(4 marks)**

(iv) Proximity **(4 marks)**

Question FIVE

a) Name four types of irreversible enzyme inhibitors **(2 marks).**

b) Mention their mode of action of the inhibitors named in (a) above. **(4 marks)**

c) Penicillin is as effective bactericidal drug. Discuss

(14 marks)