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: 2HOURS

DATE: Pick DateSelect MonthPick Year

<u>**Instructions to Candidates**</u>
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 four main levels of protein structures. **(5 marks)**

(b) Hemoglobin is an allosteric protein, whereas Myoglobin is not. How is this differences expressed **(3 marks)**

(c) Describe the structure and state the function of the following proteins.

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

   (ii) Collagen **(4 marks)**

(d) Give the systematic names and the first three digit in the E.C classification of the following reaction

   (a) Phosphoenol Pyruvate + ADP $\longrightarrow$ Pyruvate + ATP **(1 mark)**

   (b) ATP + H_2O $\longleftrightarrow$ Orthophosphate + ADP **(1 mark)**

   (c) UDP-Glucose $\longleftrightarrow$ UDP-Galactose **(1 mark)**

(e) (i) Define Co-factors **(1 mark)**

   (ii) Give five examples of Co-factors and state their respective uses. **(5 marks)**

(f) List five characteristic features of an active site of an enzyme. **(5 marks)**

Question TWO

(a) Describe the heme structure in Myoglobin, Cytochrome and Hemoglobin. **(15 marks)**

(b) Explain why an isolated heme molecule in solution binds the poisonous carbon monoxide (CO) more than when in combination with Myoglobin. **(5 marks)**

Question THREE

(a) Describe characteristics features of three named types of reversible enzyme inhibitors. **(6 marks)**

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

(c) Outline the various models that have been proposed to explain the substrate specificity of enzymes and Enzyme-Substrate (E-S) complex. **(6 marks)**

(d) Explain the mechanism of enzyme catalysis **(5 marks)**

Question FOUR

Describe the features of the active site, functions and mode of action of the following enzymes.

     (a) Ribonuclease **(5 marks)**
     (b) Lysozyme **(5 marks)**
     (c) Carboxypeptidase **(5 marks)**
     (d) Chymotrypsin **(5 marks)**

Question FIVE

(a) Derive the Michaelis Menten equation **(15 marks)**

(b) Define the parameters (enzyme kinetics) used in the Michaelis Menten equation **(5 marks)**