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TECHNICAL UNIVERSITY OF MOMBASA

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School of Applied and Health Sciences  
DEPARTMENT OF PURE AND APPLIED SCIENCES

UNIVERSITY EXAMINATION FOR:  
BACHELOR OF TECHNOLOGY IN INDUSTRIAL MICROBIOLOGY AND  
BIOTECHNOLOGY

ABT 4207: PROTEIN AND ENZYME I  
SPECIAL/SUPPLEMENTARY EXAMINATION

**SERIES: July 2025 SERIES**

**TIME: 2 HOURS**

**DATE: JULY 2025**

**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.**

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**Question ONE**

- a) Outline the differences between hemoglobin and collagen  
(6 marks)
- b) With the help of a coordinate diagram describe the difference between catalyzed and un-catalyzed reaction  
(6 marks)
- c) Describe the destabilization of  $\alpha$ -helical conformation by certain amino acid residues  
(6 marks)
- d) Differentiate between coenzymes and cofactors using relevant examples  
(6 marks)
- e) Explain some of the examples of noncompetitive inhibitors  
(6 marks)

**Question TWO**

Discuss the six major classes of enzymes with some important examples from some subclasses  
(20 marks)

### **Question THREE**

Discuss the characteristics and properties of enzymes (20 marks)

### **Question FOUR**

- a) State the Michaelis-Menten equation (2 marks)
- b) Discuss the important conclusions about Michaelis-Menten kinetics (8 marks)
- c) Discuss the difference between competitive and noncompetitive inhibitors

Competitive Inhibition (5 marks)

Non-competitive inhibition (5 marks)

### **Question FIVE**

Discuss the structure and function of myoglobin and hemoglobin proteins (20 marks)