



TECHNICAL UNIVERSITY OF MOMBASA

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

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

ABT 4308: PROTEIN AND ENZYME II
END OF SEMESTER EXAMINATION

SERIES: APRIL 2024 SERIES

TIME: 2 HOURS

DATE: DECEMBER 2024

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) Describe the reaction mechanism of enolase (6 marks)
- b) Outline examples of the proteases, naming the major amino acid residues in active site and example of enzyme in each (8 marks)

Class	Example	Active site residue
Serine proteases		
Cysteine proteases		
Aspartyl proteases		
Metalloproteases		

- c) Use a suitable example to demonstrate the activities of zymogens and pro-proteins (6 marks)
- d) Outline some common specific proteolysis means of activating enzymes in biological systems (10 marks)

Question TWO

Using the given polypeptide structure, demonstrate the products of the following enzymes:

H₂N-Gly-His-Pro-Val-Glu-Thr-Asp-Try-Asp-Arg-Ala-Cys-Val-Ser-Gln-Met-Leu-Phe-Cys-Ser-Pro-Try-Pro-His-Glu-COOH

- i) Chymotrypsin (5 marks)
- ii) Elastase (5 marks)
- iii) Carboxypeptidase (5 marks)
- iv) Outline the amino acids residue target and termini end of the enzymes above; (5 marks)

Question THREE

Discuss the structure and reaction mechanism of ribonucleases

(20 marks)

Question FOUR

Under the allosteric enzyme explain;

- i) Allosteric enzyme properties (10 marks)
- ii) Allosteric regulation mechanism (10 marks)

Question FIVE

Discuss the lysozyme catalytic mechanism

(20 marks)