



TECHNICAL UNIVERSITY OF MOMBASA
SCHOOL OF APPLIED AND HEALTH SCIENCES

Department of Pure & Applied Sciences

UNIVERSITY EXAMINATION FOR:
BACHELOR OF SCIENCE IN BIOCHEMISTRY
ABC 4202: ENZYMOLOGY SPECIAL/ SUPPLEMENTARY PAPER
END-OF-SEMESTER EXAMINATION
SERIES: DECEMBER 2024

TIME: 2 HOURS

DATE: Pick Date Dec 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) Give the systematic names and the first three digit in the E.C classification of the following reaction

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

(ii) Aminoacyl peptide + H₂O $\longleftrightarrow$ Amino acid + Peptide (2 marks)

(iii) α -D-glucose $\longleftrightarrow$ α -D-fructose (2 marks)

(b) 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)

(v) Biotin (2 marks)

(c) Name four types of irreversible enzyme inhibitors and state their modes of action in enzymes. (4 marks)

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

(e) List five (5) Industrial applications of Enzymes.

(5 marks)

Question TWO

Describe different mechanisms for the regulation of enzyme activity.

(20 marks)

Question THREE

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

(5 marks)

(b) Discuss the factors affecting enzyme catalysis.

(15 marks)

Question FOUR

(b) With examples, describe the following four major rate enhancement processes in the mechanism of catalysis in the formation of Enzyme-Substrate

(i) Strain or distortion

(5 marks)

(ii) Covalent catalysis

(5 marks)

(iii) Acid-base

(5 marks)

(iv) Proximity

(5 marks)

Question FIVE

Describe the features, functions, and mode of action that make Penicillin an effective inhibitor.

(20 marks)