

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

THIRD YEAR EXAMINATION FOR THE AWARD OF DEGREE IN BACHELOR OF  
SCIENCE IN BIOCHEMISTRY & BIOMEDICAL SCIENCE AND TECHNOLOGY

BIOC 310: ENZYMOLOGY

STREAMS: B.Sc (BIOC & BIOMED SCI) Y3S1

TIME: 2 HOURS

DAY/DATE: FRIDAY 14/12/2018

8.30 A.M - 10.30 A.M.

INSTRUCTIONS:

- Answer question **ONE** and **TWO** other questions
- Sketch maps and diagrams may be used whenever they help to illustrate your answer
- Do not write anything on the question paper
- This is a **closed book exam**. No reference material are allowed in the examination room
- There will be **No** use of mobile phones or any other unauthorized materials
- Write your answer legibly and use your time wisely

**QUESTION ONE: [30 MARKS]**

- a) What is the significance of active site in enzymatic reactions? [5 Marks]
- b) Distinguish between lyases and ligases [5 Marks]
- c) What are irreversible inhibitors of enzyme activity? Give one relevant example [5 Marks]
- d) Using a specific example, describe metal ion catalysis [5 Marks]
- e) Briefly describe all the kinetic parameters in the Michaelis-Menten equation [5 Marks]
- f) Describe the ping-pong mechanism in multi-substrate enzyme catalysis [5 Marks]

**QUESTION TWO: [20 MARKS]**

- a) Using glycogen phosphorylase, explain regulation of metabolic pathways by covalent modification of enzymes [10 Marks]
- b) Discuss the TWO models used to describe allosteric behaviour of allosteric enzymes [10 Marks]

**QUESTION THREE: [20 MARKS]**

- a) Discuss the cleavage of peptidoglycan by lysozyme [10 Marks]
- b) Discuss the biotechnological applications of enzymes [10 Marks]

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**QUESTION FOUR: [20 MARKS]**

Chymotrypsin residues aspartate 102, serine 195 and histidine 57 are required for catalysis

- a) To which EC main group does chymotrypsin belong [1 Mark]
- b) Discuss the mechanism of action of chymotrypsin [19 Marks]

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