LAIKIPIA UNIVERSITY

UNIVERSITY EXAMINATIONS

1ST SEMESTER 2022/2023 ACADEMIC YEAR

THIRD YEAR EXAMINATION FOR THE DEGREE BACHELOR OF SCIENCE (BIOCHEMISTRY)

BIOC 311: BIOCATALYSIS

STREAM: R ***TIME: 2 HRS***

DAY: FRIDAY [14.30 – 16.30] ***DATE: 09/12/2022***

THIS QUESTION PAPER CONSISTS OF THREE (3) PAGES

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INSTRUCTIONS: - Answer ALL questions in section A and ONE question in section B

SECTION A: Answer ALL questions (50 mrks)

QUESTION ONE

(a) Citing different examples, state what isoenzymes are. (3 marks)

(b) State the function of the following coenzymes and name an enzyme that requires it:
Coenzyme A and Pyridoxal phosphate. (4 marks)

(c) List the inorganic cofactor required for enzymatic activity by the following enzymes:
alcohol dehydrogenase, Cytochrome oxidase and *Taq* polymerase. (3 marks)

QUESTION TWO

(a) Define the term Abzyme and list at least three natural abzymes and their possible functions (4 marks)

(b) Classify bacterial RNase P as either Enzyme, Abzyme or Ribozyme and describe its structure and function (6 marks)

QUESTION THREE

(a) How does pH affect enzyme catalysis? (4 marks)

(b) Draw a Lineweaver- Burk plots `illustrating uncompetitive, non-competitive and competitive inhibition (6 marks)

QUESTION FOUR

Derive the Michaelis- Menten equation. (10 marks)

QUESTION FIVE

Discuss catalytic strategies used by enzymes to achieve their function. (10 marks)

SECTION B: Answer ONLY ONE question (20 mrks)

QUESTION SIX

(a) Citing specific enzyme examples, discuss enzyme classification. (10 marks)

(b) Describe the structural features of the active site and mechanism of action of Ribonuclease A (10 marks)

QUESTION SEVEN

(a) Describe the composition of pyruvate dehydrogenase complex and its mechanism of action.
(10 marks)

(b) Using examples, discuss the use of enzyme and enzyme inhibitors in medicine.
(10 marks)