

**UNIVERSITY EXAMINATIONS****FIRST SEMESTER 2025/2026 ACADEMIC YEAR****FIRST YEAR EXAMINATION FOR THE DEGREE OF
BACHELOR OF SCIENCE (BIOCHEMISTRY)****BIOC 111: INTRODUCTORY BIOCHEMISTRY AND
BIODIVERSITY*****STREAM: BIOCHEMISTRY******TIME: 2 HRS******DAY: THURSDAY [14.30 – 16.30 P.M]******DATE: 29/01/2026*****THIS QUESTION PAPER CONSISTS OF THREE (3) PAGES****PLEASE DO NOT OPEN UNTIL THE INVIGILATOR SAYS SO.**

Answer all questions in section A and any ONE Question in section B

SECTION A: ANSWER ALL QUESTIONS (50 MARKS)**QUESTION ONE**

- a) Define the term buffer solution and indicate the relevance of buffers in Biochemistry (2 Marks)
- b) List industry in which Biochemistry is applicable (2 Marks)
- c) Indicate true or false against each of the following statements (6 Marks)
- i) All endergonic reactions have a positive value for ΔG
 - ii) One micromole consists of one million picomoles
 - iii) A closed system is that which does not exchange matter and energy with its environment
 - iv) Archaea resembles eukaryotes in their gene expression
 - v) Phylogenetics relate the dead to the living
 - vi) A homolog is a gene that differs from one species to another

QUESTION TWO

- a) Why is biodiversity important to us? (4 Marks)
- b) Discuss the effects that human activities have on genes, species and ecosystem (6 Marks)

QUESTION THREE

Differentiate between:

- a) i) Supramolecules and macromolecules (2 Marks)
- ii) DNA and RNA (3 Marks)
- b) How does climate change affect biodiversity (5 Marks)

QUESTION FOUR

Explain the necessity of various chemical elements in life (10 Marks)

QUESTION FIVE

Discuss the RNA world perspective on the origin of life

**BIOC 111
(10 Marks)**

SECTION B: ANSWER ONLY ONE QUESTION (20 MARKS)

QUESTION SIX

- a) Write an essay on the salient features of a living cell **(10 Marks)**
- b) Discuss the evolutionary differences between eukaryotes and prokaryotes **(10 Marks)**

QUESTION SEVEN

- a) Using a plot, describe the mechanism of catalysis and its importance in biochemical reactions **(10 Marks)**
- b) Discuss in detail the key events of gene expression **(10 Marks)**