ΠΑΜΙΒΙΑ UΠΙVERSITY
OF SCIEΠCE AΠD TECHΠOLOGY

FACULTY OF HEALTH, APPLIED SCIENCES AND NATURAL RESOURCES

DEPARTMENT OF NATURAL AND APPLIED SCIENCES

QUALIFICATION : BACHELOR OF SCIENCE (HONOURS)	
QUALIFICATION CODE: 08BOSC	LEVEL: 8
COURSE CODE: BIO811S	COURSE NAME: BIOINFORMATICS
SESSION: JUNE 2022	PAPER: THEORY
DURATION: 3 HOURS	MARKS: 120

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
EXAMINER(S)	Prof Percy Chimwamurombe
MODERATOR:	Dr Jean-Damascene Uzabakiriho

INSTRUCTIONS
1. Answer ALL the questions.
2. Write clearly and neatly.
3. Number the answers clearly.

PERMISSIBLE MATERIALS

Non-programmable Calculators

ATTACHMENTS
None

THIS QUESTION PAPER CONSISTS OF 2 PAGES (Including this front page)

SECTION A [60 marks]

1. Use the concept of gene copy number to explain (elaborate) how it can complicate single gene circuits. (10 marks)

2. Use the example of a human disease complex to describe the concept of multigene interactions. (10 marks)

3. Choose eukaryotic gene expression control example of your choice to describe modelling whole genome circuits (10 marks)

4. Compare and contrast different types of pairwise alignments of protein sequences. (10 marks)

5. Describe a dynamic feedback control of gene expression. (5 marks)

6. Regarding database searches, write short notes on:
   a. **E-values** (5 marks)
   b. **Similarity** (5 marks)
   c. **Homology** (5 marks)

Section B (Essays Section) [60 marks]

1. Describe the use of a Biosafety Clearing House using examples. (30 marks)

2. Write a detailed essay on PSI-BLAST. (30 marks)