



PANIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF HEALTH, NATURAL RESOURCES AND APPLIED SCIENCES
SCHOOL OF NATURAL AND APPLIED SCIENCES
DEPARTMENT OF BIOLOGY, CHEMISTRY AND PHYSICS

QUALIFICATION : BACHELOR OF SCIENCE (HONOURS)	
QUALIFICATION CODE: 08BOSC	LEVEL: 8
COURSE CODE: BIO811S	COURSE NAME: BIOINFORMATICS
SESSION: JUNE 2023	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) Choose eukaryotic gene expression control example of your choice to describe modelling whole genome circuits (10 marks)
- 2) Compare and contrast different types of pairwise alignments of protein sequences. (10 marks)
- 3) Regarding database searches, write short notes on:
 - a. **E-values** (5 marks)
 - b. **Similarity** (5 marks)
 - c. **Homology** (5 marks)
- 4) Use the concept of gene copy number and how it can complicate single gene circuits (10 marks)
- 5) Use the example of a human disease complex to describe the concept of multigene interactions. (10 marks)
- 6) Describe a dynamic feedback control of gene expression. (5 marks)

Section B (Essays Section)**[60 marks]**

- 1) Write a detailed essay on PSI-BLAST. (30 marks)
- 2) Using examples, describe the use of a Biosafety Clearing House.(30 marks)