



NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF SCIENCE AND TECHNOLOGY EDUCATION
DEPARTMENT OF SCIENCE, MATHEMATICS AND TECHNOLOGY EDUCATION
BIOTECHNOLOGY PST 2135

MAIN EXAMINATION PAPER

NOVEMBER 2024

This Examination Paper consists of 2 pages.

Time Allowed: 3 hours
Total Marks: 100
Internal Examiner: Mr W.E NDABA
External Examiner: Dr P MANYANGA

INSTRUCTIONS

1. **QUESTIONS ONE and TWO** are compulsory. Choose ANY other **THREE** questions.
2. Each question carries **20 marks**.
3. Sub-division marks are shown in brackets.
4. Begin each question on a new page.

MARK ALLOCATION

QUESTION	MARKS
1.	20
2.	20
3.	20
4.	20
5.	20
6	20
TOTAL	100

- 1.a. Describe the basic principle of Gel electrophoresis and its common applications. [10 Marks]
- b. Describe the structure of three types of RNA. How does their structure support i function? [10 marks].
2. a. Distinguish a genomic library from a cDNA library explaining their relevance as biotechnology tools. [10 Marks]
- b. Discuss the primary objective and achievements of the Human genome project. [10 Marks]
3. a. i) What are Enzymes, and how are they used in Biotechnology. [8 Marks]
- ii). Polymerase Chain Reaction (PCR) amplification of short tandem repeats (STRs). [7 Marks]
- b. What is CRISPR-Cas9 Technology? [5 Marks]
- 4 i. Describe the role of Biotechnology in Medicine [10 marks}
- ii). What are Stem Cells, and how are they used in Biotechnology? [10 Marks]
- ii). What is the significance of Molecular Cloning? [10 Marks]
- 5.a. Discuss the role of Biotechnology in Agriculture [10 Marks]
- b. Describe the branches of Biotechnology [10 Marks]
- 6.a. Describe five key areas of Aquatic Biotechnology. [15 Marks]
- b. Explain the parts of Bioreactor [5 Marks]

End of Examination