



NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF SCIENCE AND TECHNOLOGY EDUCATION

DEPARTMENT OF SCIENCE, MATHEMATICS AND TECHNOLOGY  
EDUCATION

**ADVANCED GENETICS PST 6137**

Main Examination Paper

First Semester

November, 2024

This Examination Paper consists of 2 pages

Time Allowed: 3 hours

Total Marks: 100

Special Requirements: None

Examiner's Name: Mr EC Mwangi

External Examiner: Dr P Manyanga

INSTRUCTIONS

1. Answer any 4 questions of your choice.
2. Start each question on a new page.

MARK ALLOCATION

QUESTION	MARKS
1.	25
2.	25
3.	25
4.	25
5.	25
TOTAL	100

1. Evaluate the limitations of Mendelian inheritance patterns in explaining the full spectrum of observed traits in living organisms. (25marks).
2. Analyze the interplay between mitosis, meiosis, linkage, and recombination in ensuring genetic transmission and the generation of genetic diversity across generations. (25marks).
3. Discuss regulatory mechanisms that ensure accurate and efficient gene expression in complex multicellular organisms? (25marks)
4. Compare and contrast the mechanisms by which gene expression is regulated in prokaryotes and eukaryotes. (25 marks).
5. Beyond restriction enzymes and cloning vectors, evaluate the emerging tools and approaches in recombinant DNA technology. (25 marks).

**END OF QUESTION PAPER**