



NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF APPLIED SCIENCE
DEPARTMENT OF APPLIED BIOLOGY AND BIOCHEMISTRY
BACHELOR OF SCIENCE HONOURS DEGREE IN BIOTECHNOLOGY
MOLECULAR CELL BIOLOGY (SBT2104)

Main Examination Paper

DECEMBER 2024

This examination paper consists of 2 pages

Time Allowed : 3 hours
Total Marks : 100
Special Requirements : NONE
Examiner's Name : MISS T. B. MGUNI

INSTRUCTIONS

1. Answer four (4) questions. Each question carries 25 marks.
2. Where a question contains subdivisions, the mark value for each subdivision is given in brackets.
3. Illustrate your answer where appropriate with large, clearly labelled diagrams.

MARK ALLOCATION

QUESTION	MARKS
1.	25
2.	25
3.	25
4.	25
5.	25
6.	25
TOTAL	100

- 1.(a) Analyse the difference between the growth and division stages of mitosis and meiosis. (10 marks)
- (b) Explain the importance of cell motility giving examples of cells that are dependent on cell movement. (15 marks)
2. Describe post-translational modification of histones and explain how they influence gene expression.
3. (a) Describe the structure of a eukaryotic and prokaryotic protein-coding gene. (15 marks)
- (b) Outline genome organisation in eukaryotes. (10 marks)
4. Elaborate on the biochemical mechanisms involved in skeletal muscle contraction.
- 5.(a) Give a detailed account of the canonical hedgehog signalling pathway. In your answer include the isoforms of hedgehog, their tissue distribution and the biological significance of the pathway. (17 marks)
- (b) Write short notes on the key features of the canonical wnt beta-catenin signalling pathway. (8 marks)
- 6.(a) Briefly review the features of benign and malignant tumours. (10 marks)
- (b) Outline the generalised features of cancer or transformed cells. (15 Marks)

END OF EXAMINATION