



**NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**FACULTY OF APPLIED SCIENCE**  
**DEPARTMENT OF APPLIED BIOLOGY AND BIOCHEMISTRY**  
**BACHELOR OF SCIENCE HONOURS DEGREE IN BIOTECHNOLOGY**  
**INTRODUCTION TO BIOTECHNOLOGY (SBT 1201)**

**Main Examination Paper**

**SEPTEMBER 2024**

This examination paper consists of 2 pages

Time Allowed : 3 hours  
Total Marks : 100  
Special Requirements : NONE  
Examiner's Name : MR B. MUCHOVO

**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**

<b>QUESTION</b>	<b>MARKS</b>
1.	25
2.	25
3.	25
4.	25
5.	25
6.	25
<b>TOTAL</b>	<b>100</b>

1. (a) Describe the contributions made by the following individuals to biotechnology:
  - (i) Gregor Mendel (3 marks)
  - (ii) Erwin Chargaff (3 marks)
  - (iii) Hershey and Chase (3 marks)
  - (iv) Watson and Crick (3 marks)
  
- (b) Give details on the experiments carried out by Frederick Griffiths to prove that bacteria can be transformed. (13 marks)
  
2. (a) Define "starter cultures" and how they are used in fermentation. (6 marks)
- (b) Compare and contrast alcoholic and lactic acid fermentation. (19 marks)
  
3. Give an account of the processes of transcription and translation in prokaryotes, highlighting the role of the different RNA molecules involved.
  
4. Give an account of the steps involved in gene cloning.
  
5. Describe the development of *Bacillus thuringiensis* (Bt) crops and round-up ready crops highlighting the benefits and concerns surrounding their use.
  
6. Outline the application of biotechnology in the following:
  - (a) Medical and pharmaceutical biotechnology. (13 marks)
  - (b) Environmental biotechnology. (12 marks)

**END OF EXAMINATION**