



***“Investing in Africa’s future”***

**COLLEGE OF HEALTH, AGRICULTURE AND NATURAL SCIENCES**

**NANE 207: BIOTECHNOLOGY AND THE ENVIRONMENT**

**END OF SECOND SEMESTER EXAMINATIONS**

**APRIL/MAY 2023**

**LECTURER: Mr. Tabarira J.**

**DURATION: 3 HRS**

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### **INSTRUCTIONS**

Answer any **Four** questions

All questions carry equal marks (25).

DO NOT repeat material.

Write legibly.

Credit will be awarded for logical, systematic and neat presentations

### **Question 1**

- a. Outline environmental challenge in your community and suggest how biotechnology can be used/harnessed to address each one of them. **[15]**
- b. Describe the common environmental contaminations associated with livestock production and suggest mitigatory strategies. **[10]**

### **Question 2**

- a. Discuss the conflict between environmental preservation and increased crop production strategies. **[15]**
- b. Use the knowledge that you acquired during this course to suggest biotechnological solutions that may address the conflicts outlined above. **[10]**

### **Question 3**

The timber industry is one of the major economic drivers in Manicaland.

- a. Discuss the environmental challenges associated with the timber industry. **[10]**
- b. Demonstrate your understanding about the available options to convert sawdust into a resource **[15]**

### **Question 4**

- a. Discuss four factors affecting the composting process of biowaste. **[12]**
- b. State the biotechnological research priorities in the following fields:
  - i. Plant and animal breeding, **[1]**
  - ii. Environment **[1]**
  - iii. Fisheries and aquaculture **[1]**
  - iv. Manufacturing industries **[1]**
  - v. Production of biofuels **[1]**
- c. Define the term “biopesticide” and discuss the two broad classes of biopesticides. **[8]**

### **Question 5**

- a. What are the possible effects of wide adoption and cultivation of herbicide tolerant crops to the environment? **[10]**
- b. Explain advantages and disadvantages of biofertilizers in organic farming systems. **[10]**
- c. Briefly elaborate on the perception that, “there is no waste in nature”. **[5]**

**Question 6**

- a. Biotechnology has the potential to reduce the food security challenges in poor African countries. Discuss. **[15]**
- b. Write brief notes on the following:
  - i. Key uses of biosensors, **[5]**
  - ii. Environmental benefits of adoption of GMO technology, **[5]**

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**End of Paper**

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