



***“Investing in Africa’s future”***

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

**NANE 207: BIOTECHNOLOGY AND THE ENVIRONMENT**

**END OF SECOND SEMESTER FINAL EXAMINATIONS**

**MAY/JUNE 2020**

**LECTURER: MR. J. TABARIRA**

**DURATION: 48 HRS.**

**INSTRUCTIONS**

1. Choose and Answer **ONE** question only
2. DO NOT repeat material
3. Credit will be awarded for logical, systematic and neat presentations

## Question 1

- a. There is a general conflict between increased crop productivity and the preservation of the environment and biodiversity in Sub Saharan Africa. Discuss the above view under the following sub-headings:
- i. Increased crop production strategies and the perceived effects to the environment. [25]
  - ii. Preservation and maintenance of the environment and biodiversity. [20]
  - iii. Biotechnological applications and other mitigatory strategies to resolve or minimize the above conflict. [25]
- b. Microorganisms have wide applications in crop production, food industry and environmental management. Outline the roles microbes play in each of the sectors (crop production, food industry and environment) and ideal conditions necessary for the effective discharge of such functions. [30]

## Question 2

- a. Climate change is a real threat to humanity if not controlled. Demonstrate your understanding of the effects of climate change. [25]
- b. Outline how biotechnology can be applied in mitigating the effects of climate change. [25]
- c. As an Environment Officer, you have been informed of an accident involving two tankers, one with fuel and the other one carrying corrosive acids. In view of this incident:
- i. Discuss in detail the possible effects to the environment this accident could have caused. [25]

- ii. Explain all options that are available at your disposal to correct the damage that might have been caused by this unfortunate incident. [25]

### Question 3

Most African countries are experiencing food security and environmental challenges. In view of such a scenario:

- a. Discuss in detail the major causes of food insecurity or environmental problems being faced by most Africa countries. [30]
- b. As a mitigatory measure to the above challenges, giving an exhaustive justification, in which sector (Agriculture or Environment) would you recommend the adoption of GMO (genetically modified organisms) technology? [25]
- c. Solid waste generation and disposal is a major challenge at Africa University. In relation to your visit at AU Farm livestock section and the dumping site (landfill):
- i. Outline the diversity of solid waste being generated and the cost implications of its disposal. [5]
- ii. Give a critical analysis of the suitability of the current AU land fill and suggest possible improvements. [20]
- iii. Discuss feasible options available for the reduction of solid waste being taken to the landfill. [20]

**END OF EXAMINATION PAPER**