



**MASINDE MULIRO UNIVERSITY OF  
SCIENCE AND TECHNOLOGY  
(MMUST)**

**MAIN CAMPUS  
MAIN EXAMINATIONS**

**UNIVERSITY EXAMINATIONS  
2021/2022 ACADEMIC YEAR**

**FIRST YEAR SECOND SEMESTER EXAMINATIONS**

**FOR THE DEGREE  
OF  
BACHELOR OF SCIENCE IN  
BIOCHEMISTRY/BIOLOGY/NATURAL RESOURCE  
MANAGEMENT/BIOTECHNOLOGY/AGRICULTURAL  
EDUCATION AND EXTENSION/ EDUCATION (SCIENCE)**

**COURSE CODE: SZL 121**

**COURSE TITLE: FUNDAMENTALS OF ECOLOGY**

**DATE: FRIDAY, 29<sup>TH</sup> APRIL 2022**

**TIME: 12:00 – 2:00 P.M.**

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**INSTRUCTIONS TO CANDIDATES**

Answer ALL questions in section A and ANY TWO selected from section B

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 2 Printed Pages. Please Turn Over.

**SECTION A (SHORT ANSWER QUESTIONS, 40 MARKS)**

1. Briefly explain why despite our many scientific and technological advances, we still depend on nature. (5 marks)
2. Define an ecological footprint and explain how our Ecological Footprints affect the Earth. (5 marks)
3. What is the Second Law of Thermodynamics and why is it important? (5 marks)
4. Outline the three principles of sustainability and explain, in terms of sustainability what do our lives and economies depend on. (5 marks)
5. Using a diagrammatic illustration, show the hierarchical order of ecosystem organization in ecology. (5 marks)
6. (a) What is biodiversity and why is it important? (3 marks)  
(b) Explain how the Earth's life change over time. (2 marks)
7. Using equations, depict the processes of energy production (photosynthesis) and consumption of Energy (anaerobic respiration). (5 marks)
8. Distinguish between Net Primary Production (NPP) and Gross Primary Production (GPP). (5 marks)

**SECTION B (ESSAY QUESTIONS, 30 MARKS)**

9. a) Based on energy flow in an ecosystem, describe the concept of ecological efficiency and explain why it is important. (5 marks).  
(b) Why don't we clear cut tropical rainforests to grow crops for humans? (10 marks).
10. Populations of various frog species can decline because of the effects of harmful environmental factors at different points in their life cycle. Discuss such environmental factors. (15 marks).
11. (a) Using an example, explain a predator-prey relationship. (5 marks)  
(b) Describe ways in which preys can avoid their predators and four ways which predators can capture their preys. (10 marks)