



# MACHAKOS UNIVERSITY

University Examinations for 2018/2019 Academic Year

SCHOOL OF ENVIRONMENT AND NATURAL RESOURCES MANAGEMENT

DEPARTMENT OF ENVIRONMENTAL SCIENCES

FIRST YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR IN ENVIRONMENTAL SCIENCE

ERC 104: PRINCIPLES OF BIOLOGY

DATE: 26/7/2019

TIME: 11.00-1.00 PM

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## INSTRUCTIONS:

Answer question ONE and any other TWO questions

### QUESTION ONE

- a) Give reasons for huge energy losses as energy flows from one trophic level to the next. (10 marks)
- b) Describe the following concepts
- a. Biosphere. (4 marks)
  - b. Consumers. (4 marks)
  - c. Ecology. (4 marks)
  - d. Ecological Pyramid. (4 marks)
  - e. Nitrification and Denitrification. (4 marks)

### QUESTION TWO

Discuss the hydrological cycle processes and how it is disrupted by human activities. (20 marks)

### QUESTION THREE

- a) Distinguish with examples between food chain and food web (10 marks)

- b) Explain why ecosystems that are seldom disturbed are likely to have more species diversity than ecosystems that undergo moderate disturbance. (10 marks)

#### **QUESTION FOUR**

Describe the characteristics of the following biomes and explain what would happen if they are converted to agricultural farms.

- a) Tropical rain forests (10 marks)  
b) Savannah grassland (10 marks)

#### **QUESTION FIVE**

- a). State the two fundamental laws of thermodynamics (10 marks)  
b). Explain why in a natural ecosystem there are more grass eating rabbits than rabbit eating foxes. (10 marks)