



MACHAKOS UNIVERSITY

University Examinations For 2018/2019 Academic Year

SCHOOL OF ENVIRONMENT AND NATURAL RESOURCES MANAGEMENT

DEPARTMENT OF ENVIRONMENTAL SCIENCES

FIRST YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF ENVIRONMENTAL STUDIES (RESOURCE CONSERVATION)

ERC 104: PRINCIPLES OF BIOLOGY

DATE: 2/5/2019

TIME: 11:00 – 1:00 PM

INSTRUCTIONS: Answer question ONE and TWO other questions

QUESTION ONE (COMPULSORY) (30 MARKS)

- a) Distinguish with examples between population and community. (10 marks)
- b) Explain why the carnivores are in much higher danger of extinction compared to other species in the same ecosystem (10 marks)
- c) Discuss why a simplified/manipulated ecosystem like a maize plantation is much more susceptible to harm from pests and diseases than a more complex natural ecosystem (10 marks)

QUESTION TWO (20 MARKS)

A temperate deciduous forest contains the following organisms: oak tree, grass, mouse, rabbit, crow, hawk, mushroom, beetle, and snake.

- a) Using a diagram, discuss a food web using at least five of these organisms. (15 marks)
- b) If one of the organisms used in your web becomes unavailable, discuss what possible effect this would have on the web. (5 marks)

QUESTION THREE (20 MARKS)

Describe the following concepts

- a) Ecosystem (4 marks)
- b) Ecological niche (4 marks)
- c) Hydrologic cycle (8 marks)
- d) Ecological succession (4 marks)

QUESTION FOUR (20 MARKS)

- a) Outline any five key human activities that are capable of impairing the carbon cycle
(5 marks)
- b) Discuss the adverse environmental impacts predicted to result from impaired carbon cycle
(15 marks)

QUESTION FIVE (20 MARKS)

- a) Green plants produce most of the oxygen in our atmosphere through a series of complex reactions. Name and describe this generalized reaction.
(10 marks)
- b) Each week, an owl must eat an average of five mice weighing 10 grams each in order to survive and each mouse would have consumed 100 grams of plant material. Explain how this scenario relates to trophic levels.
(10 marks)