



# MACHAKOS UNIVERSITY

University Examinations 2019/2020 Academic year

SCHOOL OF HEALTH SCIENCES

DEPARTMENT OF PUBLIC AND COMMUNITY HEALTH

FIRST YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE IN PUBLIC HEALTH.

HPH 109: ECOLOGY AND HEALTH

DATE: 7/12/2020

TIME: 8.30-10.30 AM

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## INSTRUCTIONS

This paper consists of two sections A and B

### SECTION A

- This section has one question
- The question is compulsory
- The question is 30 marks

### QUESTION ONE (30 marks)

- Define ecology, detailing what ecologists seek to explain by the study of ecology (3 marks)
- Explain why balance is necessary in a food web (3 marks)
- Differentiate between the following
  - Natural and artificial ecosystems
  - Ecological stability and ecological resilience
  - Heterotrophs and Autotrophs (3 marks)
- Highlight three (3) ecological and natural processes that are determinants of health(3 marks)
- Explain the 10% rule of energy transfer in an ecosystem (3 marks)
- Outline the significance of food chains (3 marks)
- Using a relevant example, briefly explain the link between the grazing and detritus food chain (3 marks)
- Explain the effects of natural selection on populations in an ecosystem (3 marks)

- i) The recent Australian fires destroyed large tracts of bushland. Explain the ecological succession that is likely to occur in the affected areas (3 marks)
- j) Outline three (3) factors that affect per capita population growth rate (3 marks)

**SECTION B: ANSWER ANY TWO QUESTIONS. EACH QUESTION CONTAINS 20 MARKS**

- This section has four (4) questions
- Answer any two (2) questions
- Each question is 20 marks

**QUESTION TWO (20 MARKS)**

- a) The following are found in a food web; Forest-field ecosystem, Corn, Decomposers, Deer, Fox, Grass, Mouse, Owl, Rabbit, Seed-eating bird, Snake, Squirrel, Tree. Construct a food web from the above giving examples at each trophic level (10 marks)
- b) Describe how nitrogen is recycled through the activity of soil bacteria and fungi to make it available to plants. (10 marks)

**QUESTION THREE (20 MARKS)**

- a) Discuss measures that the government of Kenya has put in place to conserve the ecology (10 marks)
- b) Discuss the effects of human activity on the water cycle (10 marks)

**QUESTION FOUR (20 MARKS)**

- a) Discuss the trophic levels that occur in any ecosystem and comment on what would happen to the free energy available at each trophic level if the amount of sunlight reaching the ecosystem was drastically reduced. (10 marks)
- b) Explain five (5) core functions of National Environmental Management Authority in Kenya (10 marks)

**QUESTION FIVE (20 MARKS)**

- a) Discuss the various types of ecologies (10 marks)

- b) Human activity is a major threat to the planet's biodiversity. Discuss the effects of unsustainable farming as a major threat to ecosystems biodiversity (10 marks)