



MACHAKOS UNIVERSITY

University Examinations for 2020/2021

SCHOOL OF PURE AND APPLIED SCIENCES
DEPARTMENT OF BIOLOGICAL SCIENCES
FIRST YEAR SECOND SEMESTER EXAMINATION FOR
BACHELOR OF EDUCATION (SPECIAL NEEDS)
BACHELOR OF EDUCATION (SCIENCE)
BACHELOR OF SCIENCE (BIOLOGY)
SZL 101: INTRODUCTION TO ECOLOGY AND BIOANALYSIS

DATE: 17/6/2021

TIME: 2:00 – 4:00 PM

INSTRUCTIONS

Answer Question One and Any Other Two Questions

SECTION A (COMPULSORY)

QUESTION ONE (30 MARKS)

- a) Explain:
- i. the environmental influence on an organism's biotic potential (2 marks)
 - ii. The benefits of a clumped population distribution to prey animals (2 marks)
- b) If the main food for an aquatic bird is fish and there is overfishing in the lake, explain the likely effect on the:
- i. Birds' population (1 mark)
 - ii. carrying capacity of the bird's environment (1 mark)
- c) The ever-increasing human population is a threat to its sustainability. Explain three possible ways by which humans could manipulate the carrying capacity of their environment to enhance their sustainability (3 marks)
- d) Study the following food chain:
- A → B → C
- i. From a named ecosystem, give an example of each letter (2 marks)
 - ii. Between B & C, which one has more energy available to it? Explain why? (3 marks)

e) The data below was collected from a population of grasshoppers:

Month	Number
1	56
2	98
3	203
4	421

- i. Based on the data, how would you describe the population growth? Explain your answer (2 marks)
- ii. Predict the growth of this population in future? Explain. (3 marks)
- iii. Describe a possible method used to determine this population numbers (3 marks)
- iv. Describe two challenges he may have faced in determining the numbers (2 marks)

f) An ecology student observed that the removal of some predators in an ecosystem resulted in death of the herbivores. Determine possible reasons for the deaths (3 marks)

g) Explain the relationship between pollinator bees and flowering plants (3 marks)

SECTION B: ANSWER ANY TWO QUESTIONS

QUESTION TWO (20 MARKS)

Discuss the effects of the competitive exclusion principle on an established ecosystem.

QUESTION THREE (20 MARKS)

You have gone to conduct an ecological study at Serengeti National Park. Discuss possible:

- a) co-existence challenges in the Park (10 marks)
- b) Adaptive mechanisms for co-existence (10 marks)

QUESTION FOUR (20 MARKS)

Describe five:

- a) important processes in the cycling of water (10 marks)
- b) Factors that influence aquatic biomes (10 marks)

QUESTION FIVE (20 MARKS)

Discuss ecological succession