



MACHAKOS UNIVERSITY

University Examinations for 2020/2021

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FIRST YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF EDUCATION (SPECIAL NEEDS)

BACHELOR OF SCIENCE (BIOLOGY)

BACHELOR OF EDUCATION (SCIENCE)

SZL 101: INTRODUCTION TO ECOLOGY AND BIOANALYSIS

DATE:12/8/2021

TIME:2:00 – 4:00 PM

INSTRUCTIONS

Answer Question One and Any Other Two Questions

1. 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 OTHER TWO QUESTIONS

- 2. Discuss the effects of the competitive exclusion principle on an established ecosystem. (20 marks)
- 3. 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)
- 4. Describe five:
 - a) important processes in the cycling of water (10 marks)
 - b) Factors that influence aquatic biomes (10 marks)
- 5. Discuss ecological succession (20 marks)