



MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

DECEMBER SESSION EXAMINATION FOR

BACHELOR OF EDUCATION SCIENCE

SZL 101: INTRODUCTION TO ECOLOGY AND BIOANALYSIS

DATE: SCHOOL BASED

TIME : 2 HOURS

INSTRUCTIONS

1. Answer Question 1 (compulsory) and **any two** questions in Section B.
2. Use clean well labelled diagrams wherever appropriate.

QUESTION ONE (COMPULSORY) (30 MARKS)

- a) Explain the following terms;
i) Biome ii) Biosphere iii) Natality. (3 marks)
- b) Explain any three population attributes. (3 marks)
- c) A predator is regulatory. Explain this concept. (3 marks)
- d) Distinguish between population regulation and population control (3 marks)
- e) Discuss time specific life tables. (3 marks)
- f) Giving examples explain the following: (3 marks)
i) Amensalism
ii) Mutualism
iii) Parasitism
- g) Briefly explain the influence of abiotic factors on growth of a population. (3 marks)
- h) Explain survivorship curves found in various populations. (3 marks)
- i) During a personal hygiene inspection, a teacher saw fungi creeping between the toes of a student . Briefly discuss the level of ecology. (3 marks)
- j) Carbon is a necessary evil in the environment. Explain (3 marks)

SECTION B: ANSWER ANY TWO QUESTIONS (40 MARKS)

QUESTIONS TWO (20 MARKS)

- a) Assuming that a 1st year ecology student was conducting an ecological study in a fish pond, give two possible examples of each of the following from his sampling unit: (3 marks)
- i) Abiotic factors
 - ii) consumers
 - iii) detritivores.
- b) The ecology student caught 350 fish from a pond. He put some tags on them and returned them back into the pond. After two weeks, he went back to the same pond and caught 715 fish. He found that of the 715 fish caught in his second visit, 250 had also been caught and tagged in his first visit. Based on the information given:
- i) Explain the aim of the student's activity. (1 mark)
 - ii) Estimate the number of fish in that pond. (4 marks)
 - iii) Describe 2 possible causes of error in the estimate of the total number of fish. (2 marks)
- c) In his report, the ecology student expressed displeasure while undertaking the study. Discuss the basis of his expression. (10 marks)

QUESTION THREE (20 MARKS)

- a) The sun is the major source of energy in an ecosystem,. Explain how sun's energy gets into bacteria and fungi. (10 marks)
- b) Interactions within an ecosystem can have consequences on biodiversity. Discuss. (10 marks)

QUESTION FOUR (20 MARKS)

- a) Discuss the chemical and physical parts of the environment considered when studying the distribution of organisms. (10 marks)
- b) Stone mining is a common activity in many parts of Kenya. Discuss how ecological succession can occur in the derelicted areas. (10 marks)

QUESTION FIVE (20 MARKS)

A natural community comprises the following organisms; insects, rodents, trees, cows, reptiles, lions, birds, pigs, bacteria, crustacians and fishes. Using illustrations, explain energy flow within the ecosystem.