MACHAKOS UNIVERSITY

University Examinations 2018/2019

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FIRST YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE IN BIOLOGY

BACHELOR OF EDUCATION (SCIENCE)

SZL 101: INTRODUCTION TO ECOLOGY BIOANALYSIS

DATE: 3/5/2019 **TIME: 2.00-4.00 PM**

INSTRUCTIONS

Answer questions one and any other two questions

SECTION A

QUESTION ONE (30 MARKS)

a) Differentiate between

i. The law of tolerance and the concept of limiting factors (2 marks)

ii. Stenothermal and euryhaline species (2 marks)

iii. Mutualism and commensalism (2 marks)

b) Describe two mechanisms by which organisms deal with competition (4 marks)

c) Explain why:

i. Different populations of animals come together and live in the same geographical area (2 marks)

ii. biomass varies from one level to the other in an ecological pyramid (3 marks)

d) Explain how the environment influences an organisms biotic potential (2 marks)

e) An ecology class went out sampling in a small pond.

i. Outline a simple food chain they are likely to observe in their sampling unit (3 marks)

ii. Name 4 abiotic factors that may affect the distribution of organisms in their sampling unit (2 marks)

f) An ecology student obtained a sample of 432 grasshoppers which he tagged and returned in their natural environment. After 5 hours, he returned to make another sample in the same environment. He sampled 567 grasshoppers, 47 of which were those he had tagged in his earlier sampling.

i. Estimate the total number of grasshoppers living in his sampling environment using the data collected by the ecology student, (3 marks)

ii. Describe 2 possible causes of error in your estimate of the total number of grasshoppers (2 marks)

g) Explain the significance of ecological studies in kenya (3 marks)

SECTION B

QUESTION TWO (20 MARKS)

Describe:

a) processes by which atmospheric nitrogen becomes available to the biosphere (8 marks)

b) the significance of increased concentrations of carbon dioxide in the atmosphere (8 marks)

c) how man affects the cycling of phosphorus (4 marks)

QUESTION THREE (20 MARKS)

a) Describe the structure of an ecological system (13 marks)

b) Explain the movement of energy in an ecosystem (7 marks)

QUESTION FOUR (20 MARKS)

a) Give an example of an ecosystem and describe how it sustains itself (10 marks)

b) Explain possible implications of introducing a new species in a given ecosystem (10 marks)

QUESTION FIVE (20 MARKS)

a) Describe ecological techniques used by ecologists to study nature (14 marks)

b) Discuss challenges an ecologist may encounter in the undertaking of ecological studies (6 marks)