MACHAKOS UNIVERSITY

University Examinations 2016/2017

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FIRST YEAR SECOND SEMESTER EXAMINATION FOR DEGREE IN

BACHELOR OF EDUCATION (SCIENCE)

BACHELOR OF SCIENCE (BIOLOGY)

SZL 101: INTRODUCTION TO ECOLOGY AND BIOANALYSIS

DATE: 31/5/2017 **TIME: 8:30 – 10:30 AM**

INSTRUCTIONS

Answer Question **ONE** in Section A and **ANY TWO** questions in Section B

SECTION A (COMPULSORY) (30 MARKS)

1. 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) Differentiate between:

   i. Co-evolution and competitive exclusion (2 marks)
   ii. Edge and ecotone (2 marks)
   iii. niche and habitat (2 marks)

   c) An ecology student caught 150 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 300 fish. He found that of the 300 fish caught in his second visit, 50 had also been caught and tagged in his first visit. Based on the information given:

   i. Explain the aim of the students activity (1 mark)
   ii. Estimate the number of fish in that pond (3 marks)
   iii. Describe 2 possible causes of error in the estimate of the total number of fish (2 marks)

d) 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)

e) Outline two (2) characteristics of each of the following organisms:

i. R- selected (2 marks)

ii. K selected (2 marks)

f) Briefly describe any three (53 mechanisms by which community members deal with competition (3 marks)

g) Describe three (3) characteristics of a desert biome (3 marks)

SECTION B: ANSWER ANY OTHER TWO QUESTIONS

2. Describe (explain):

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)

3. a) Describe the term 'ecological succession' (5 marks)

b) Describe the process of ecological succession (15 marks)

4. 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)

5. a) Discuss abiotic factors that affect the distribution of organisms in an area (12 marks)

b) Explain the movement of energy in an ecosystem (8 marks)