NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF HEALTH AND APPLIED SCIENCES

DEPARTMENT OF NATURAL AND APPLIED SCIENCES

QUALIFICATION: BACHELOR OF SCIENCE	
QUALIFICATION CODE: 07BOSC	**LEVEL:** 7
COURSE CODE: ECO701S	**COURSE NAME:** ECOLOGY
SESSION: JULY 2019	**PAPER:** THEORY
DURATION: 3 HOURS	**MARKS:** 100

SUPPLEMENTARY / SECOND OPPORTUNITY EXAMINATION PAPER	
EXAMINER (S):	**Prof. Edosa Omoregie**
MODERATOR:	**Prof. Isaac Mapaure**

INSTRUCTIONS
1. Answer all questions 2. Write clearly and neatly 3. Number your answers clearly

PERMISSIBLE MATERIAL

Scientific Calculator

THIS QUESTION PAPER CONSISTS OF 3 PAGES
(Including this front page)

Question 1 **[20]**

a) Define the following terms in an ecological context. Each question carries 1 mark. (5)
   i. Autecology
   ii. Biome
   iii. Emigration
   iv. Predation
   v. Niche overlap

b) Briefly explain the following terms in an ecological context. Each question carries 1 mark. (5)
   i. Organismal ecology
   ii. Natural selection
   iii. Density dependent factors
   iv. Macroevolution
   v. Intraspecific competition

c) Briefly discuss the ecological characteristics of the Arctic Tundra. (10)

Question 2 **[20]**

a) With the use of graphical illustrations, discuss how the process of natural selection will affect quantitative traits of animals in adapting to their environment. (6)

b) Using a graphical illustration, briefly explain the main difference in niche overlap between a specialist and a generalist species. (8)

c) In a tabular form briefly explain the ecological trends that lead to increase and decrease in species diversity. (6)

Question 3 **[20]**

a) During a field survey to estimate the population of giraffe in a farm, an ecologist captured and marked 52 giraffe and released back into the farm. On a subsequent survey, he captured 25, out of which 16 were marked. Using the Lincoln-Peterson Index, estimate the population of giraffe on the farm. (4)

b) Briefly describe the techniques involved in the use of the Capture-Recapture method for the estimation of population within a geographic location. (6)

c) In an ecological survey on the population of giraffes at Okapuka Range, an ecologist recorded the number of surviving populations for each age group in the following Table. Compute the population of the giraffes surviving (l_x) from start to age group 25 – 29 years, the number of giraffes dying during each age interval (d_x) and the per capita rate of mortality for each age interval (q_x). Show the calculations for each age group.

x (years)	n_x	l_x	d_x	q_x
0 – 4	104			
5 – 9	98			
10 – 14	75			
15 – 19	69			
20 – 24	64			
25 - 29	5			

Sketch the survivorship curve for the above survey and indicate which type of curve is the giraffes population displaying. (10)

Question 4 **[20]**

a) In a tabular form, differentiate any four characters *r*-selected from *k*-selected organisms. (4)

b) With the aid of graphic illustrations, discuss the exponential and logistic growth models of population growth. (16)

Question 5 **[20]**

a) Discuss the biogeographical factors that affect community diversity. (12)

b) Using suitable formulae, briefly explain the Harvest method technique in the measurement of primary productivity. (8)