MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2016/2017

THIRD YEAR FIRST SEMESTER EXAMINATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE IN FISHERIES AND AQUACULTURE AND BACHELOR OF SCIENCE IN AQUATIC RESOURCES CONSERVATION AND DEVELOPMENT WITH INFORMATION TECHNOLOGY

MAIN CAMPUS

AFN 303: DYNAMICS OF NATURAL POPULATIONS

Date: 10th December, 2016 Time: 12.00 - 3.00 pm

INSTRUCTIONS:

- Answer ALL the questions in SECTION A and in SECTION B answer question 9 and any other THREE questions.

AFN 303: DYNAMICS OF NATURAL POPULATIONS

Date: ....

Time: ....

INSTRUCTIONS

1. Answer ALL the questions in section "A" (40 marks). In "section B" (30 marks), answer Question 9 and any other THREE questions.
2. Illustrate answers with labeled diagrams whenever appropriate.
3. Any illustrations in response to data provided in the question booklet must be drawn to scale.

SECTION A (40 marks)

Answer all the questions in this section

Q1. a). Define the term population (1 mark)

  b). Explain the balancing of animal population sizes (4 marks).

Q2. Explain *geometric* and *arithmetic* rates of change with regard to named resources and population characteristics (5 marks).

Q3. Give the <u>equation</u> that describes rate of change in natural populations and explain each components of this equation (5 marks).

Q4. Describe the interplay of intrinsic and extrinsic factors in the control population size (5 marks).

Q5. Explain the Malthusian doctrine on sustained growth of natural populations (5 marks).

Q6. (a). Explain the following with reference to human population; crude birth rate, crude death rate (2 marks).

(b).   If crude birth rate = 38 and crude death rate = 32. Calculate the natural percentage rate of population growth (3 marks).

Q7.   Explain environmental resistance with reference to human and natural populations (5 marks).

Q8.   Use illustration(s) to explain the parts of *J* and *S* shaped curves in population growth (5 marks).

Section B (30 Marks)

Answer Question-NINE-and any other Three questions from this section

Q9.   Malthusianism and Darwinism blend in the explanation on the role of population characteristics that relates to the process of evolution. Discuss (9 marks).

Q10. The factors that tend to limit population sizes are categorized into density dependent and density independent. Explain (7 marks).

Q11   Explain reproductive performance as a factor with the human population, "dynamics" and hence explain replacement level fertility and zero population growth (7 marks).

Q12. (a)   Explain exponential growth of a population (2 marks).

  (b)   In terms of human population growth our time on this planet is just about to be *a macrocosm of Easter Island*. Explain (5 marks).

Q13. (a).   Explain the various concepts of migration (4 marks).

  (b).   Give examples of migrations in animals (3 marks).