UNIVERSITY OF SWAZILAND

SUPPLEMENTARY EXAMINATIONS: 2004/2005

PROGRAMME: BACHELOR OF SCIENCE IN AGRICULTURE: APH
OPTION YEAR IV

COURSE CODE: APH 402

TITLE OF PAPER: LIVESTOCK BREEDING

TIME ALLOWED: TWO (2) HOURS

INSTRUCTIONS: ANSWER ANY FOUR (4) QUESTIONS

**DO NOT OPEN THIS PAPER UNTIL PERMISSION HAS BEEN GRANTED BY
THE CHIEF INVIGILATOR.**

QUESTION 1

a) Among 361 Navaho Indians tested in New Mexico, Boyd reported 305 of blood group M, 52 of blood group MN, and 4 of blood group N. Calculate the allelic frequencies in this population.   (4 marks)

b) The initial frequency of allele A is 0.6. The rate of forward mutation is 0.0004. At allelic equilibrium, what is the reverse mutation rate? (4 marks)

c) Describe the effects of non-random mating on the genetic properties of a population. (12 marks)

d) Why does response to selection decline as selection progresses?   (5 marks)

QUESTION 2

Write short essays on the following:

a) Importance of correlations between traits in livestock breeding. (12 marks)

b) Crossbreeding for the formation of new breeds.   (13 marks).

QUESTION 3

Discuss the use of individual performance as a source of information for livestock selection. (25 marks)

QUESTION 4

a) Distinguish between the following:

    i) Repeatability and heritability. (4 marks)
    ii) Heterosis and inbreeding depression. (4 marks)

b) Outline the benefits of crossbreeding in pig improvement. (12 marks)

c) Mean growth rate in a certain beef cattle population is 0.7 kg/day. Heifers selected to be the dams of the next generation have a mean growth rate of 0.8 kg/day, and the young bulls selected to be the sires have a mean growth rate of 1.2 kg/day. If h^2 of growth rate is 45% in that population, calculate response to selection after one generation of selection.   (5 marks)

QUESTION 5

Discuss the conditions for the Hardy-Weinberg law.   (25 marks)

QUESTION 6

Write short notes on the following:

a) Random genetic drift.   (7 marks)

b) Breeding value.   (10 marks)

c) Intensity of selection.   (8 marks)