



2ND SEM. 2006/2007

UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER

PROGRAMME: B. Sc. ANIMAL SCIENCE II

COURSE CODE: APH 202

TITLE OF PAPER: ANIMAL BREEDING

TIME ALLOWED: TWO (2) HOURS

INSTRUCTIONS: ANSWER ANY 4 QUESTIONS.

• THIS PAPER MAY NOT BE OPENED UNTIL THE CHIEF INVIGILATOR HAS GRANTED PERMISSION.

QUESTION 1

a) Study the table below and answer the questions that follow:

	Genotypes			Total
	AA	Aa	aa	
Initial frequencies	$p^2 = 0.36$	$2pq = 0.48$	$q^2 = 0.16$	1.0
Coefficient of selection(s)	0	0	1	
Relative fitness	1	1	0	

- i. Calculate the genotypic frequencies after selection. **(8 Marks)**
- ii. What will be the gene frequencies after selection? **(5 Marks)**

b) Distinguish between positive assortative mating and negative assortative mating and discuss how these two mating systems affect the stability of gene and genotypic frequencies of populations. **(12 Marks)**

QUESTION 2

Write an essay entitled 'The role of inbreeding in livestock improvement'.

(25 Marks)

QUESTION 3

- a) An isolated (*panmictic*) field of corn was found to be segregating for yellow and white endosperm. Yellow is governed by a dominant allele and white by its recessive allele. A random sample of 1 000 kernels revealed that 900 were yellow. Find the allelic frequency estimates for this population. **(5 Marks)**

b) Allele B_1 mutates to B_2 at the rate of 1×10^{-4} while B_2 mutates back to B_1 at the rate of 1×10^{-5} . If the initial frequency of B_1 was 0.81 and that of B_2 was 0.19, calculate the allelic frequencies after one generation of mutation.

(5 Marks)

c) Average weaning mass of a certain beef herd is 240 kg. A breeder selects replacement heifers that average 250 kg and young bulls that average 300 kg. If h^2 of weaning mass is 30 %, calculate expected weaning mass of the offspring.

(5 Marks)

d) Distinguish between the following:

i. Heritability and repeatability

ii. Quantitative and qualitative traits

(10 Marks)

QUESTION 4

Discuss heredity and environment in the context of livestock improvement in the tropics and subtropics.

(25 Marks)

QUESTION 5

Outline a strategy for improving the rate of genetic progress in your selection programme.

(25 Marks)