2ND SEM. 2008/2009

UNIVERSITY OF SWAZILAND

SUPPLEMENTARY 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.

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QUESTION 1

a. What is the basis of inbreeding depression? **(15 Marks)**

b. Consider rare disorders in a population caused by an autosomal recessive mutation. From the frequencies of the disorder in the population given, calculate the percentage of heterozygous carriers:

i. 0.0064

ii. 0.000081

iii. 0.09

iv. 0.01

v. 0.10 **(10 Marks)**

QUESTION 2

a. Discuss possible genetic and physiological explanations for the phenomenon of heterosis. **(12 Marks)**

b. Study the table below and answer the questions that follow:

	Genotypes			
	AA	Aa	aa	Total
Initial frequencies	$p^2 = 0.64$	$2pq = 0.32$	$q^2 = 0.04$	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)**

QUESTION 3

Discuss heredity and environment in the context of livestock improvement in the tropics and subtropics. **(25 Marks)**

QUESTION 4

a. A new pig breeder, Mr. Mhazo, has a herd of 80 pigs in which the frequency of the gene for swirls (abnormal hair) is 0.7. Assume one pair of genes controls swirls and the gene for normal hair is completely dominant to the gene for swirls. Mr. Mhazo buys 30 breeding pigs with normal hair, selected at random, from a herd with a gene frequency for swirls of 0.05.

   i. What is the frequency of the gene for swirls in the expanded herd? **(4 Marks)**

   ii. What is the difference in gene frequencies in the herd before and after the purchase of the breeding pigs? **(4 Marks)**

   iii. What force/tool is Mr. Mhazo using to reduce the amount of swirls in his herd? **(2 Marks)**

b. Distinguish between the following:

   a. Heterosis and inbreeding depression. **(5 Marks)**

   b. Random genetic drift and founder effect. **(5 Marks)**

   c. Progeny testing and sib selection. **(5 Marks)**

QUESTION 5

Write detailed notes on the FIVE forces that affect stability of gene frequencies in populations. **(25 Marks)**