**UNIVERSITY OF SWAZILAND**
**FACULTY OF AGRICULTURE**

**DEPARTMENT: ANIMAL PRODUCTION AND HEALTH**

**FIRST SEMESTER EXAMINATIONS: 2004/2005**

**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.**

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QUESTION 1

a) i) Define the term gene frequency. (2 marks)

ii) The following genotype frequencies of the human M-N blood groups were recorded in a sample of American Whites:

| Blood group: | M | MN | N |
|---|---|---|---|
| Frequency: | 0.29 | 0.50 | 0.21 |

Calculate the gene/allelic frequencies in this sample. (3 marks)

b) i) State the Hardy-Weinberg law. (3 marks)

ii) What is the frequency of heterozygotes (Aa) in a randomly mating population if the frequency of the recessive phenotype (aa) is 0.04? (2 marks)

c) Describe the effects of migration on the genetic properties of a population. (10 marks)

d) What is assortative mating? (5 marks)

QUESTION 2

Outline how you would attempt to improve response to selection in your selection programme. (25 marks)

QUESTION 3

Discuss the objectives in beef cattle improvement, giving the methods for achieving them. (25 marks)

QUESTION 4

Discuss the importance of the following in the genetic improvement of livestock populations:

a) Repeatability. (10 marks)
b) Herd/flock size. (7 marks)
c) Genotype/environment interaction. (8 marks)

QUESTION 5

a) Discuss the factors that affect the magnitude of heritability. (15 marks)

b) Describe Tandem selection. (10 marks)

QUESTION 6

a) What are the major differences between qualitative and quantitative characters? (15 marks)

b) Briefly discuss the importance of variation in the genetic improvement of livestock populations. (10 marks)