



2ND SEM. 2004/2005

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UNIVERSITY OF SWAZILAND

SUPPLEMENTARY EXAMINATIONS: 2004/2005

**PROGRAMME: DIPLOMA IN AGRICULTURE YEAR II
 DIPLOMA IN AGRICULTURAL EDUCATION YEAR II
 REMEDIAL YEAR IN AGRICULTURE
 REMEDIAL YEAR IN AGRICULTURAL EDUCATION**

COURSE CODE: APH 202

TITLE OF PAPER: PRINCIPLES OF GENETICS

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

Outline the contribution of genetics to agriculture. (25 marks)

QUESTION 2

What are the functions of the following?

- a) Nucleosomes? (5 marks)
- b) Helicases? (5 marks)
- c) Phosphodiester bonds? (5 marks)
- d) Transfer RNA? (5 marks)
- e) Messenger RNA? (5 marks)

QUESTION 3

- a) Describe the process of chain initiation in DNA-mediated polypeptide synthesis. (5 marks)
- b) What is the importance of genetic abnormalities in animal production? (5 marks)
- c) Give the type and proportions of gametes produced by an individual of genotype PpRrYy. (5 marks)
- d) Briefly describe the process of transcription. (10 marks)

QUESTION 4

- a) A man and a woman who are both carriers of the albino allele c are married. If this couple is to have 3 children in separate births, what is the probability that all the 3 children will be albino? (5 marks)
- b) Define the following terms:
 - i) Breeding true. (2 marks)
 - ii) Penetrance. (2 marks)
 - iii) Recombinant (2 marks)
 - iv) Euploidy (2 marks)
 - v) Heterozygosity. (2 marks)
- c) If rabbits of genotypes $c^{ch}c^h$ and c^hc are mated, what proportion of progeny will be Himalayan? (5 marks)
- d) Describe the first step in DNA replication. (5 marks)

QUESTION 5

Write an essay entitled, "Genetic code." (25 marks)

QUESTION 6

Describe the structure of DNA. (25 marks)