WOMEN'S UNIVERSITY IN AFRICA

Addressing gender disparity and fostering equity in University Education

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FACULTY OF AGRICULTURAL SCIENCES

BSc. Hons in ANIMAL SCIENCE

MAIN PAPER

MSc: AS 215 Principles of Genetics

INTAKE: **FIRST YEAR FIRST SEMESTER**

DATE: **TIME: 3 HOURS**

INSTRUCTIONS TO CANDIDATES

Answer any four questions.

1. Distinguish between the following terms in the field of 'genetics'
   a) Genetics, heredity and variation. [5 marks]
   b) Nucleotide , DNA and genes. [10 marks]
   c) Chromatin, chromatid and chromosome [10 marks]

2. i)Give a scientific report ofGregor Mendel's experiments which changed the field of genetics. [15marks]
   ii) Discuss the significance of mitosis and meiosis in agriculture. [10 marks]

3. a)Describe the application of genetics principles to improve agriculture in any two of the following case studies.

i) The 'The Green Revolution'. [10 marks]
ii) Netherlands agriculture, post Second World War. [10 marks]
iii) History (past 70 years) of genetic improvements in Zimbabwe's agriculture. [10 marks]

b) Define 'spindle fibres' and state their use. [5 marks]

4. Fully describe all the stages of meiosis. [25 marks]

5. a) Describe the structure and function of chromosomal features. [15 marks]

b) Outline the various basisfor distinguishing chromosomes from each other. [10 marks]

6.i) Explain, with appropriate terminology, the process of animal gametogenesis in both male and female mammals. [20 marks]

ii) State and illustrate (with a diagram) the three functional groups forming a nucleotide.

[5 marks]