



*"Investing in Africa's future"*

**COLLEGE OF HEALTH AGRICULTURE AND NATURAL  
SCIENCES**

**NAAS405: ANIMAL BREEDING**

**END OF FIRST SEMESTER EXAMINATION  
NOVEMBER 2025**

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DURATION: 3 HRS**

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**INSTRUCTIONS**

Answer all questions in Section A and any **three** from Section B

Section A carries **40 marks** and each question in section B carries **20 marks**.

**SECTION A:** Answer **all** questions from this section.

**Question 1**

- a) Define the following terms:
- i. Selection index. [2]
  - ii. Genetic erosion; [2]
  - iii. Progeny testing; and [2]
  - iv. Phenotypic variation. [2]
- b) Differentiate close-breeding from cross-breeding. [4]
- c) Describe genotype  $\times$  environment interactions. [4]
- d) Outline the advantages of pedigree selection in beef cattle production. [6]
- e) Giving examples, outline a three-way rotational cross involving a Brahman, Simmental and Sussex. [6]
- f) Explore non-genetic factors which affect milk yield in dairy production. [6]
- g) Outline the procedure for individual performance testing. [6]
- [40]**

**SECTION B:** Answer any **three** (3) questions from this section.

**Question 2**

Discuss the factors that affect response to selection in farm animals. [20]

**Question 3**

Explore the factors to be considered in designing a breeding programme for any livestock species of your choice. [20]

**Question 4**

a) Using examples, discuss performance-related challenges that are likely to be faced by named dairy breeds of cattle as a result of climate change. [12]

b) Suggest ways of addressing these challenges in Question 4a. [8]

**Question 5**

a. A Tuli bull at Tinorima Farm in Mutasa District gains 1.2 kgs/day on a feeding trial in which average gain is 0.8 kg/day. All animals are fed and managed identically, and gains are adjusted for initial age and weight. If  $h^2$  of weight gain is 0.45.

i. Calculate the animal's EBV. [5]

ii. Determine the accuracy of its EBV. [3]

b. Explain the implications of high and low heritability. [6]

c. Outline the importance of cryopreservation in artificial insemination. [6]

**Question 6**

Discuss traits of economic importance in dairy cattle breeding. [20]

**END OF QUESTION PAPER!!!**