AFRICA UNIVERSITY
A United Methodist-Related Institution

COLLEGE OF HEALTH, AGRICULTURE AND NATURAL SCIENCES

DEPARTMENT OF AGRICULTURAL SCIENCES

END OF FIRST SEMESTER FINAL EXAMINATION

COURSE: **ANIMAL BREEDING**

CODE: **NAAS406**

DATE: **NOVEMBER 2023**

DURATION: **THREE (3) HOURS**

INSTRUCTOR: **DR. D. CHIKWANDA**

INSTRUCTIONS TO CANDIDATES

1. Answer ALL questions in **section A** and any three questions in **section B**
2. Section A carries **40 marks** and each question in section B carries **20 marks**
3. There are two (3) printed pages

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

Question 1

a. Define the following terms:

i. Molecular genetics; [2]

ii. Pedigree selection; [2]

iii. Estimated breeding value; [2]

iv. Genetic variation; and [2]

v. Terminal crossing. [2]

b) Differentiate tandem selection from independent culling levels methods. [4]

c) Outline the advantages of the nucleus breeding scheme. [6]

d) Giving examples, outline a three-way rotational cross. [6]

e) Explore non-genetic factors which affect litter size in pig production. [6]

f) Outline the procedure for progeny testing. [8]

[40]

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

Question 2

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

Question 3

Discuss characteristics that are desirable in chicken breeding. **[20]**

Question 4

Outline the following animal genetic resource valuation methodologies:

a. Farm simulation model; [5]

b. Hedonic; [5]

c. Market share; [5]

d. Production loss averted; and [5]

e. Evaluation of breeding programme. [5]

[20]

Question 5

a. A Mashona bull at the University farm gains 1.4 kgs/day on a feeding trial in which average gain is 1.0 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. [7]

c. Describe genotype × environment interaction. [5]

[20]

Question 6

Explore the factors to be considered in designing a breeding programme of an animal species of your choice. . **[20]**

END OF QUESTION PAPER!!!