



MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)

University Examinations 2015/2016 Academic Year

SCHOOL OF AGRICULTURE AND NATURAL RESOURCES MANAGEMENT

DEPARTMENT OF AGRICULTURE EDUCATION AND EXTENSION

FIRST SEMESTER EXAMINATION FOR DEGREE IN BACHELOR OF SCIENCE IN
AGRICULTURE EDUCATION AND EXTENSION

KRM 204: PRINCIPLES OF ANIMAL BREEDING

Date: _____

Time: _____

INSTRUCTIONS:

Answer question one and two other questions

SECTION A: (COMPULSORY) 30 MARKS

QUESTION ONE:

a) Explain the following terminologies

- i) Epistasis (2 marks)
- ii) Mutation (2 marks)
- iii) Genetic Load (2 marks)

b) The data below presents weaning weights for 10 calves.

Calf	1	2	3	4	5	6	7	8	9	10
Weaning weight (kg)	204	183	193	189	173	191	208	203	198	200

- i) Calculate the mean weaning weight of the calves. (2 marks)
- ii) Calculate the variance in weaning weights for the calves. (2 marks)

- iii) If heritability (h^2) estimates for weaning weights trait in beef calves is 0.25. Calculate the variance that is due to additive gene action. (3 marks)
- c) Distinguish between
- i) Natural and Artificial selection (2 marks)
 - ii) Heterosis and Inbreeding depression (2 marks)
- d) Explain the following with reference to Biotechnology in animal breeding
- i) Artificial insemination. (2 marks)
 - ii) Multiple ovulation and embryo transfer. (2 marks)
 - iii) Cryopreservation. (2 marks)
 - iv) Clones (2 marks)
- e) Explain the causes of resemblance among littermates in a Swine family (5 marks)

SECTION B: 40 MARKS

QUESTION TWO:

- a) Explain how animal genetic resources can be conserved. (3 marks)
- b) Describe the methods used for multiple trait selection. (17 marks)

QUESTION THREE:

- a) Explain the factors that can change gene frequencies in populations. (15 marks)
- b) In a population of 1000 cattle the horned animals were 250.
- i) Calculate the frequency of the polled gene trait in the population (2 marks)
 - ii) If the individuals homozygous for the polled genes are 250. Calculate the genotypic frequency for the heterozygous individuals (3 marks)

QUESTION FOUR

- a) Explain the major constraints for the improvement of livestock production in Kenya under the following sub-headings:
- i) Sector policy and infrastructure (10 marks)
 - ii) Breeding programmes and genetic gain. (10 marks)

QUESTION FIVE

- a) Explain the disadvantages of inbreeding (6 marks)
- b) Explain the reasons for cross breeding. (14 marks)