



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012

SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE (AGRIBUSINESS AND TRADE AND AGRICULTURAL RESOURCE MANAGEMENT)

KRM 204: PRINCIPLES OF ANIMAL BREEDING

DATE: MONDAY 2ND APRIL 2012

TIME: 8.00 A.M – 10.00 A.M

INSTRUCTIONS

Answer Questions ONE and any other THREE Questions

1. Discuss briefly the breeding management approached to improving the following traits in farm animals.
 - a. Reproductive traits [5 marks]
 - b. Egg production traits [5 marks]
 - c. Milk production traits [5 marks]
 - d. Fibre production traits [5 marks]
 - e. Carcass quality traits [5 marks]
2.
 - a.
 - i) What is embryo transfer [2 marks]
 - ii) State the practical applications of embryo transfer in the improvement of dairy cattle. [5 marks]
 - b.
 - i) What is artificial insemination [1 mark]
 - ii) List six (6) advantages of using artificial insemination. [3 marks]
 - iii) List four (4) disadvantages of using artificial insemination [2 marks]
 - c. Describe how to use a system of independent culling levels for traits at different ages in selection programme for Red Masaai sheep. [2 marks]

3. a. What are the causes of phenotypic variation? [5 marks]
- b. i) State two (2) reasons why animal genetic resources should be preserved. [8 marks]
- ii) Discuss four (4) reasons why farm animal genetic resources should be conserved. [8 marks]
4. a. Differentiate between Disruptive Selection and Directional Selection. [4 marks]
- b. In Angus Cattle the allele for black coat colour (B) is dominant over the allele for red coat colour (b) . A population in Hardy- Weinberg Equilibrium has the following allele frequencies $f(B) = \frac{2}{3}$ and $f(b) = \frac{1}{3}$. Assume that Negative Assorted Mating takes place.
- i. State the mating rules in Negative Assorted Mating. [1 mark]
- ii. Calculate the expected genotypic frequencies in the progeny. [7 marks]
- iii. Calculate the gene frequencies in the progeny . [2 marks]
- iv. What general statement can you make about gene and genotypic frequencies under Negative Assorted Mating? [1 mark]
5. a. Assume two populations where $f(b) = 0.2$ in population 1 and $f(b) = 0.6$ in population 2. If the number of animals in population 1 is 8,000 and 2,000 migrate from population 2 to population 1. Calculate the change in gene frequency of b in population 1 after one(1) generation of migration. [3 marks]
- b. Differentiate between Heterozygosity and Polymorphism [2 marks]
- c. Calculate the average Heterozygosity in a study of 4 loci in a population if the frequencies of heterozygotes at these loci were 0.21, 0.37, 0.29 and 0.17 [5 marks]
- d. Using electrophoresis, thirty (30) gene loci in a breed of goats were studied . The number of polymorphic loci out of the 30 studied were 19, 20, 12 and 25. Calculate the average polymorphism in the 4 populations. [5 marks]