



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**SCHOOL OF AGRICULTURAL AND FOOD SCIENCES**

**SECOND YEAR SEMESTER ONE UNIVERSITY EXAMINATION FOR THE DEGREE  
OF BACHELOR OF SCIENCE IN ANIMAL SCIENCE**

**2016/2017 ACADEMIC YEAR**

**REGULAR**

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COURSE CODE: AAS 3215

COURSE TITLE: Animal Genetics

EXAM VENUE:

STREAM: BSc. Horticulture

DATE:

EXAM SESSION:

TIME: 2 HOURS

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Instructions:

1. Answer ALL the questions in section A and any TWO in section B.
  2. Candidates are advised not to write on question paper.
  3. Candidates must hand in their answer booklets to the invigilator while in the examination room.
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**SECTION A [30 MARKS]**

**Answer ALL questions from this Section.**

Q1.

- (a) Draw structure of a gene and explain functions of its parts (3 marks)
- (b) Define the term relative fitness (1 mark)
- (c) How does animal breeding utilizes trait variation (2marks)
- (d) State various levels where genetic variation can be observed in animals ( 4 marks)

Q2. a. Genetic diversity is affected by several evolutionary forces. State them and explain how they influence diversity. (5 marks)

b. Using formulae and variances explain what constitutes the phenotypic value of an individual (3 marks)

c. Using formulae differentiate between broad and narrow sense heritability (2 marks)

Q3. a. Explain the usefulness of ecological, sexual, purifying, positive and balancing selections in animal breeding (5 marks)

b. Using a diagram explain how self fertilization affects heterozygosity and homozygosity over time (3 marks)

c. If heterozygosity (H) was initially 0.5, what would be the expected level of heterozygosity after 5 generations? (2 marks)

**SECTION B [40 MARKS]**

**Answer any TWO QUESTIONS in this Section.**

Q3. Describe the role and different methods of animal selection (20 marks)

Q4. The different animal breeding schemes may be grouped into pure breeding and crossbreeding. Discuss (20 marks)

Q5. Hardy-Weinberg equilibrium is very important in population genetics. State it, the equation involved and its important assumptions (20 marks)

