



**MERU UNIVERSITY COLLEGE
OF SCIENCE & TECHNOLOGY**

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University Examinations 2010/2011

**FIRST YEAR, FIRST SEMESTER EXAMINATIONS FOR DIPLOMA IN
AGRICULTURAL EDUCATION AND EXTENSION**

BIO 0111: GENETICS

DATE: APRIL 2011

TIME: 1½ HOURS

INSTRUCTIONS: *Answer questions one and any two questions*

QUESTION ONE – (30 MARKS)

- (a) Define the following terms:
- (i) Genotype
 - (ii) Phenotype (4 Marks)
- (b) Distinguish between the following terms
- (i) Test cross and reciprocal cross. (4 Marks)
 - (ii) Complementary genes and supplementary genes. (4 Marks)
- (c) Describe the following categories of apomixes:
- (i) Adventives embryony
 - (ii) Parthenogenesis (6 Marks)
- (d) State three merits and three demerits of mass selection as a method of crop population improvement. (6 Marks)
- (e) State the differences between mitosis and meiosis processes of cell division. (6 Marks)

QUESTION TWO – (15 MARKS)

- (a) Describe two types of disease resistance. (6 Marks)
- (b) Discuss the mechanism of disease resistance. (6 Marks)
- (c) State three mechanisms of insect resistance. (3 Marks)

QUESTION THREE – (15 MARKS)

- (a) Define cross pollination. (2 Marks)

- (b) Describe the mechanism that facilitate cross pollination. (6 Marks)
- (c) State the relevance of the mode of reproduction and pollination. (3 Marks)
- (d) Highlight the ways of overcoming self-incompatibility. (4 Marks)

QUESTION FOUR – (15 MARKS)

- (a) Discuss the importance of genetics. (6 Marks)
- (b) State the chemical composition of chromosomes. (3 Marks)
- (c) State the mendelian law of independent assortment. (2 Marks)
- (d) Show how the above law is applicable. (4 Marks)

QUESTION FIVE – (15 MARKS)

- (a) Discuss the following methods of crop improvement.
 - (i) Mutation
 - (ii) Pureline(8 Marks)
- (b) State the importance of asexual reproduction in plants. (4 Marks)
- (c) The environment in which gene occurs affect its expression. Explain. (3 Marks)