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University Examinations 2011/2012

SECOND YEAR, SECOND SEMESTER EXAMINATIONS FOR DIPLOMA IN AGRICUTURE

BIO 0111: GENETICS AND PLANT BREEDING

DATE:APRIL 2012 **TIME: 1½ HOURS**

INSTRUCTIONS: *Answer question **one** and any other **two** questions*

QUESTION ONE (30 MARKS)

a. Discuss the importance of genetics I agriculture (5 Marks)
b. State the law of independent assortment (2 Marks)
c. Explain briefly the following chromosome structure changes:
   i. Translocation
   ii. Deletion (6 Marks)
d. Explain the sources of polyploidy in organisms (6 Marks)
e. Discuss how nature favours cross pollination (8 Marks)
f. Define the following terms:
   i. Nullisomic
   ii. Plementary genes
   iii. Homozygous recessive (3 Marks)

QUESTION TWO (15 MARKS)

a. Define the term mutation (2 Marks)
b. State three characteristics of mutation
c. Explain two types of mutation
d. Discus two types of mutation **(**10 Marks)

QUESTION THREE (15 MARKS)

a. Discuss the improvement achieved in genetic engineering (10 Marks)
b. State five steps of genetic engineering as they follow each other (5 Marks)

QUESTION FOUR (15 MARKS)

a. Discuss the mass selection method of crop improvement (10 Marks)
b. State the importance of mass selection method (5 Marks)

QUESTION FIVE (15 MARKS)

a. Menchel carried out a breeding experiment with garden pea plant in which pure breeding pea plant grown from seed with wrinkled coat. All the seeds produced where found have as smooth coat. When plant were grown from these seeds and allowed self-pollinate the second generation of seeds included both smooth and wrinkled seeds in the ration of 3.1

Using appropriate symbol for the alleles for smooth and wrinkled coat, construct a genetic diagram to show the behavior of the alleles in this experiment (6 Marks)

b. Discuss the mechanisms that facilitate self pollination (6 Marks)
c. State the importance of pure line selection in crop improvement (3 Marks)