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**University Examinations 2015/2016**

SECOND YEAR, FIRST SEMESTER EXAMINATION FOR DIPLOMA IN AGRICULTURE

**BIO 0111: GENETICS AND PLANT BREEDING**

**DATE: AUGUST, 2016 TIME: 1 ½ HOURS**

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

**QUESTION ONE – (30 MARKS)**

1. Defines the following terms: (10 Marks)
2. Plant breeding
3. Phenotype
4. Homologous chromosomes
5. Mitosis
6. Genetic engineering
7. Discuss any three types of chromosomal structural changes. (9 Marks)
8. Explain what happens to the chromosomes and chromatids during the following stages of meiosis. (6 Marks)
9. Prophase 1
10. Metaphase 1
11. Telophase 11
12. Describe briefly with appropriate examples five objectives of plant breeding.(5 Marks)

**QUESTION TWO (15 MARKS)**

1. Draw and name the cell cycle of the cell division. (5 Marks)
2. Discuss the importance of mitotic cell division in eukaryotes. (6 Marks)
3. State four advantages of plant tissue culture as method in crop improvement. (4 Marks)

**QUESTION THREE (15 MARKS)**

1. Discuss the mechanisms that facilitate self pollination to take place in crop plant.(6 Marks)
2. Differentiate between meiosis and mitosis cell division in organisms. (4 Marks)
3. In peas, the allele for round seed(R) is dominant over the allele for wrinkled seed (r). The allele for yellow seed (y) is dominant over the allele for green seed (Y). If the two peas with genotype YyRr and YyRr are crossed together, what of the phenotype is expected in the F1 generation? (5 Marks)

**QUESTION FOUR (15 MARKS)**

1. Explain the sources of polyploidy in organisms. (4 Marks)
2. Discuss the sources of genetic variation among the organisms. (6 Marks)
3. Briefly describe the pure line methods of crop improvement. (5 Marks)