



**EMBU UNIVERSITY COLLEGE  
(A CONSTITUENT COLLEGE OF THE UNIVERSITY OF NAIROBI)**

**TRIMESTER EXAMINATIONS 2013/2014**

**FIRST YEAR EXAMINATION FOR THE DEGREE OF MASTER OF  
SCIENCE IN GENETICS**

**SBT 548: APPLIED GENETICS**

**DATE: DECEMBER 6, 2013**

**TIME: 2.00 – 5.00PM**

**INSTRUCTIONS:**

**Answer Question ONE and ANY Other THREE Questions.**

**QUESTION ONE**

- a) Describe the importance of genes from crop wild relatives and the steps taken to enhance in situ conservation (7 marks).
- b) Describe 7 new approaches to crop improvement (14 Marks).
- c) Describe the importance of anther culture and give 3 advantages of haploid plants produced through this technique (4 Marks).

**QUESTION TWO**

- a) Cytogenetic techniques have become necessary components of studies of the organization of the genome. Describe five techniques used in distinguishing chromosomes from different genomes (10 Marks).
- b) Discuss the 3 views that explain the genetic basis of host resistance to pathogens (15 Marks).

### **QUESTION THREE**

- a) Describe using a growth curve the 5 growth stages of a callus tissue (15 Marks).
- b) Describe the two major components of nitrogenase (10 Marks).

### **QUESTION FOUR**

- a) Explain the mode of action, structure and specificity of  $\delta$ -endotoxins used in pest control (10 Marks).
- b) i) State 7 novel techniques of genetic transfer (7 Marks).
- ii) Describe gene targeting using zinc finger endonucleases (8 Marks).

### **QUESTION FIVE**

- a) Outline the process of somatic hybridization and 3 main methods of protoplast fusion (8 Marks).
- b) Describe the procedure used in testing new secondary metabolites from microorganisms and describe 3 such products (7 Marks).
- c) Explain five categories of genetic resources (10 Marks).

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