# UNIVERSITY OF EMBU

**2016/2017 ACADEMIC YEAR**

**SECOND SEMESTER EXAMINATION**

**FOURTH YEAR EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN HORTICULTURE**

**ACS 405: PLANT BREEDING II**

**DATE: APRIL 7, 2017** **TIME: 2:00-4:00PM**

**INSTRUCTIONS:**

**Answer Question ONE and ANY Other TWO Questions**

## QUESTION ONE

a) State two challenges faced by a plant breeder when breeding for pest resistance. (2 Marks)

b) List three causes of genetic erosion. (3 Marks)

c) State three reasons perpetuating the use of farm-retained groundnut seeds in Kenya. (3 Marks)

d) Assume you are a cabbage breeder in Kenya; write in detail three breeding objectives that you will address to ensure the Kenyan population reaps the benefits of this crop. (3 Marks)

e) Explain three sources of germplasm that can be utilized by a Kenyan sorghum breeder. (3 Marks)

f) Elucidate on the benefits of farmer participation when improving horticultural crops suitable for specific markets. (3 Marks)

g) State three advantages of single-seed descent breeding as compared to bulk population breeding. (3 Marks)

h) Briefly explain how you can artificially cross pollinate cotton. (5 Marks)

i) Outline the steps you will take to breed for resistance to a plant pathogen conditioned by a dominant gene using backcross method in a self-pollinated species. (5 Marks)

**QUESTION TWO**

a) Briefly discuss the potential application of genomics in breeding wheat in East Africa. (10 Marks)

b) Write short notes on breeding methods for tomato improvement. (10 Marks)

**QUESTION THREE**

a) You are required to test 12 varieties across 4 locations over 2 years. Assuming the experiment will be laid in a randomized complete block design with four replications, draw a sample ANOVA showing the sources of variation and degrees of freedom. (12 Marks)

b) Discuss four major breeding priorities to increase coffee production in Kenya. (8 Marks)

**QUESTION FOUR**

a) Assume you are a maize breeder working for a seed company, explain the steps you will follow to develop hybrid seed using cytoplasmic male sterility. (12 Marks)

b) Explain three mechanisms by which plants resist drought. (8 Marks)

**QUESTION FIVE**

a) Explain five challenges that hamper conventional breeding of citrus. (10 Marks)

b) Write short notes on germplasm conservation technologies. (10 Marks)

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