



EMBU UNIVERSITY COLLEGE

(A Constituent College of the University of Nairobi)

2015/2016 ACADEMIC YEAR

SECOND SEMESTER EXAMINATION

**FOURTH YEAR EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE
(HORTICULTURE)**

ACS 405: PLANT BREEDING II

DATE: APRIL 5, 2016

TIME: 02:00-04:00

INSTRUCTIONS:

Answer Question ONE and ANY Other TWO Questions

QUESTION ONE

- a) Briefly explain the contribution of plant breeding in Kenya to ensure food security. (5 Marks)
 - b) Describe the procedure of producing a multiline. (3 Marks)
 - c) State four advantages of bulk population breeding. (5 Marks)
 - d) Quality traits including shape and size of some horticultural produce influence the preference of customers. In relation to these, discuss challenges that a plant breeder may anticipate when introgressing traits for disease resistance from wild germplasm into commercial tomato. (4 Marks)
 - e) Explain four mechanisms used by plants to protect themselves against drought stress. (4 Marks)
 - f) Explain the concept of plasticity in relation to crop adaptation (2 Marks)
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- g) Write briefly on the contribution of genomics to plant breeding (4 Marks)
- h) Outline three factors to consider for successful emasculation. (3 Marks)

QUESTION TWO

- a) Write short notes on germplasm conservation in Kenya. (10 Marks)
- b) Outline the procedure of marker-assisted selection followed in order to pyramid different major genes in a single cultivar. (10 Marks)

QUESTION THREE

- a) Discuss the procedure of producing hybrid seed using cytoplasmic male sterility. (10 Marks)
- b) Explain the limitations of mutagenesis as a plant breeding technique. (10 Marks)

QUESTION FOUR

Write a proposal on developing an improved rice cultivar with resistance to a specific disease that is conditioned by a major gene showing all steps to be taken from germplasm acquisition to cultivar release. (20 Marks)

QUESTION FIVE

- a) Describe the method of developing a clonal cultivar for an asexually propagated species such as sugarcane through hybridization. (7 Marks)
- b) Explain mass selection procedure and state its applications in plant breeding. (10 Marks)
- c) Explain three advantages of backcross method of plant breeding. (3 Marks)

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