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University Examinations 2015/2016

THIRD YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF
BACHELOR OF SCIENCE IN HORTICULTURE

AHS 2306: PLANT BREEDING

DATE: NOVEMBER 2015

TIME: 2 HOURS

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

QUESTION ONE (30 MARKS)

- a) Define the following terms
- i) Plant breeding (2 Marks)
 - ii) Genetic erosion (1 Marks)
 - iii) Heterosis (2 Marks)
- b) Differentiate mass selection breeding methods from bulk population breeding method (4 Marks)
- c) Plant breeders need to have a lot of knowledge on plant physiology as well as statistics. Explain (5 Marks)
- d) Outline any four roles played by plants breeding in increasing global food security (4 Marks)
- i) Outline any six objectives of plant breeding (3 Marks)
- e) Male sterility is common in some plant.

- i) Define the term male sterility (2 Marks)
- ii) Outline the possible causes of male sterility (3 Marks)
- f) Differentiate broad sense heritability from narrow sense heritability (4 Marks)

(QUESTION TWO (20 MARKS))

- a) There are three classes of male-sterility. Give a detailed explanation of each stating its cause (12 Marks)
- b) Self incompatibility is one of the mechanisms which facilitate cross pollination in plants like maize.
 - i) What is self- incompatibility (1 Marks)
 - ii) Outline any three possible causes of self-incompatibility (3 Marks)
 - iii) Briefly explain the two types of self-incompatibility (4 Marks)

QUESTION THREE (20 MARKS)

- a) Inbreeding is a practise that is supposed to be discouraged by farmers.
 - i) What is inbreeding (2 Marks)
 - ii) Briefly explain any four effects of breeding (8 Marks)
- b) Explain the possible genetic basis for heterosis (7 Marks)
- c) Outline any three applications of heritability (3 Marks)

QUESTION FOUR (20 MARKS)

- a) Hybrid breeding is commonly practical by the seed producing companies
 - i) What is hybrid breeding
 - ii) State any two advantages and two disadvantages of this breeding method (2 Marks)
- b) Differentiate composite variety from synthetic variety (2 Marks)
 - i) State any three desirable features of a synthetic cultivator (3 Marks)
- c) What is a disease epidemic? (2 Marks)
 - i) Give a detailed explanation of the various causes of disease epidemics (6 Marks)
 - ii) Briefly explain the various morphological features in insect pest resistance (5 Marks)