



1ST SEMESTER 2020/2021

PAGE 1 OF 3

UNIVERSITY OF ESWATINI

RE-SIT/SUPPLEMENTARY EXAMINATION PAPER

PROGRAMMES: BACHELOR OF SCIENCE IN AGRONOMY YEAR FOUR
BACHELOR OF SCIENCE IN HORTICULTURE YEAR FOUR

COURSE CODE: CPR 403

TITLE OF PAPER: CROP BREEDING

TIME ALLOWED: TWO (2) HOURS

INSTRUCTIONS: ANSWER ANY FOUR (4) QUESTIONS

DO NOT OPEN THIS PAPER UNTIL PERMISSION HAS BEEN GRANTED BY THE
CHIEF INVIGILATOR

QUESTION 1

Discuss the three Mendelian Laws of genetics and support your answer with relevant examples showing phenotypes, genotypes and phenotypic ratios. (25 Marks)

[25 MARKS]

QUESTION 2

- a) Discuss the alternation of the sporophytic and gametophytic generations in crop plants. (10 Marks)
- b) Discuss the different systems of homomorphic self-incompatibility in crop plants with examples of crops under each type. (10 marks)
- c) What is the significance of self-incompatibility in crop breeding programmes? (5 marks)

[25 MARKS]

QUESTION 3

- a) Discuss the meaning of all the variance parameters in the equation;

$$V_P = V_A + V_D + V_I + V_E + V_{G \times E} \quad (12 \text{ Marks})$$

- b) Define heritability, types of heritability and uses of heritability estimates in crop breeding programmes. (13 marks)

[25 MARKS]

QUESTION 4

- a) What is the purpose of progeny testing in pure line selection breeding programmes? (5 marks)
- b) Describe how hybridization is achieved in self-pollinated crops. (5 marks)
- c) Give the criteria of selecting parents in the pedigree and bulk breeding methods. (4 marks)
- d) Define hybrid varieties and discuss how different types of hybrids are developed from a set of inbred lines. Support your answer with well labelled diagrams. (11 Marks)

[25 MARKS]

41

QUESTION 5

Write an essay for a seminar presentation on the application of plant biotechnology in modern crop breeding programmes.

[25 MARKS