



1ST SEMESTER 2017/2018

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UNIVERSITY OF SWAZILAND

MAIN EXAMINATION PAPER

**PROGRAMMES: BACHELOR OF SCIENCE IN AGRONOMY YEAR THREE
BACHELOR OF SCIENCE IN HORTICULTURE YEAR THREE**

COURSE CODE: CP 301

TITLE OF PAPER: CROP BREEDING

TIME ALLOWED: TWO (2) HOURS

**INSTRUCTIONS: ANSWER QUESTION 1 AND ANY OTHER THREE (3)
QUESTIONS OF YOUR CHOICE**

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CHIEF INVIGILATOR**

QUESTION 1 (COMPULSORY QUESTION)

Explain in detail the following terms as they are applied to crop breeding and genetics;

- a) Quantitative traits (3 Marks)
- b) Components of the phenotypic variance (3 Marks)
- c) Components of the genetic variance (3 Marks)
- d) Genetic advance under selection (3 Marks)
- e) Negative and positive mass selection (4 Marks)
- f) A pure line (2 Marks)
- g) Progeny testing (3 Marks)
- h) Hybridisation (2 Marks)
- i) Backcrossing (2 Marks)

[25 MARKS]

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QUESTION 2

Discuss the following terms used in reproduction of crop plants.

- a) Microsporocyte (2 Marks)
- b) Megasporocyte (2 Marks)
- c) Microspores (2 Marks)
- d) Megaspores (2 Marks)
- e) Microgametophyte (3 Marks)
- f) Megagametophyte (4 Marks)
- g) Sporophyte (2 Marks)
- h) Sporophytic self-incompatibility (4 Marks)
- i) Gametophytic self-incompatibility (4 Marks)

[25 MARKS]

QUESTION 3

- a) Define apomictic crops (3 Marks)
- b) Discuss the various ways in which apomictic crops are produced. (15 Marks)
- c) What are the advantages of using apomictic crops in crop breeding programmes? (7 Marks)

[25 MARKS]

QUESTION 4

Discuss how inbred lines are developed and used in the development of hybrid maize varieties. Your answer must be supported by the types of hybrids that can be developed and their parental composition.

[25 MARKS]

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QUESTION 5

- a) Define molecular markers and give four examples. (10 Marks)
- b) Explain uses of molecular markers in crop breeding programmes. (15 Marks)

[25 MARKS]