

**NATIONAL UNIVERSITY OF LESOTHO**

**FACULTY OF AGRICULTURE**

**B.Sc. AGRICULTURE EXAMINATION**

**CPS 317: PRINCIPLES AND METHODS OF PLANT BREEDING**

**DECEMBER 2019**

**MARKS: 100**

**TIME: 3HRS**

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**INSTRUCTIONS: ANSWER A TOTAL OF FOUR QUESTIONS**

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**QUESTION 1 [30 marks]**

Explain the following breeding methods used in cross-pollinated crops,

- a) Half-sib selection with progeny test [5 marks]
- b) Half-sib selection with test cross [5 marks]
- c) Full-sib selection [5 marks]
- d) Selection from So progeny test [5 marks]
- e) Reciprocal recurrent selection [5 marks]
- f) Composite and synthetic breeding [5 marks]

**QUESTION 2 [30 marks]**

- a) State the objectives of plant breeding [10 marks]
- b) Which science disciplines are required to support plant breeding profession? [10 marks]
- c) Explain the accomplishments made to-date in plant breeding that have contributed to food security [10 marks].

**QUESTION 3 [30 marks]**

With an aid of a diagram explain the following;

- a) Mode of reproduction in crop plants [10]
- b) Different types of non-allelic (gene) interactions [10]
- c) Different types of cross-over [10]

**QUESTION 4 [30 marks]**

**Section A**

Write short notes on the following;

- a) Single, three-way and double cross hybridization [10]
- b) Features promoting cross-pollination [10]
- c) Difference between quantitative and qualitative traits [10]

**or**

**Section B**

- a) Explain the process followed when a cultivar is registered [10]
- b) Write short notes on seed multiplication of a newly registered seed [10]
- c) Compare and contrast the following breeding methods in cross-pollinated crops; half-sib selection with progeny test, half-sib selection with a tester and full-sib selection [10]