

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

INSTRUCTIONS: ANSWER A TOTAL OF FOUR QUESTIONS

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]