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2425/101
PRINCIPLES OF CROP PRODUCTION I AND
SOIL SCIENCE
Oct./Nov. 2018
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN AGRICULTURE

MODULE I

PRINCIPLES OF CROP PRODUCTION I AND SOIL SCIENCE

3 hours

INSTRUCTIONS TO CANDIDATES

*This paper consists of TWO sections; A and B.
Answer any THREE questions from section A and any TWO questions from section B in the answer booklet provided.
All questions carry equal marks.
Maximum marks for each part of a question are indicated.
Candidates should answer the questions in English.*

This paper consists of 3 printed pages.

Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

SECTION A (60 marks)

Answer any **THREE** questions from this section.

1. (a) Explain the importance of agroforestry tree species in soil and water conservation. (8 marks)
- (b) Explain the factors that influence nitrogen fixation in leguminous fodder crops. (12 marks)
2. (a) Outline the steps involved in seed production. (12 marks)
- (b) Describe the effects of plant morphology and anatomy on effectiveness of herbicides. (8 marks)
3. (a) Outline the procedure involved in clonal selection. (8 marks)
- (b) Explain the factors considered when selecting cuttings. (12 marks)
4. (a) Highlight the role of seed legislation in Kenya. (8 marks)
- (b) (i) Define the term 'hybridization'.
(ii) Highlight the advantages of hybridization in crop production.
(iii) Outline the steps involved in hybridization. (12 marks)
5. (a) Describe nitrogen nutrient in crops with respect to:
(i) functions;
(ii) deficiency symptoms. (10 marks)
- (b) Highlight the problems affecting marketing of farm produce. (10 marks)



SECTION B (40 marks)

Answer any TWO questions from this section.

6. (a) Highlight the properties of umbric diagnostic epipedon. (3 marks)
- (b) (i) Define the term 'cation exchange capacity (CEC)'.
(ii) Describe the factors influencing cation exchange capacity.
(iii) Explain the importance of cation exchange capacity. (17 marks)
7. (a) Using chemical equations, explain the following causes of soil acidity:
(i) hydrolysis of aluminium ions;
(ii) microbial acid production. (12 marks)
- (b) Describe the effects of soil acidity on plant nutrient availability. (8 marks)
8. (a) Explain the criteria used in classification of parent materials. (10 marks)
- (b) Using an illustration, describe the organic soil colloids. (10 marks)

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