

Name: _____ Index No. _____ / _____

2425/101
PRINCIPLES OF CROP PRODUCTION I
AND SOIL SCIENCE
Oct./Nov. 2013
Time: 3 hours

Candidate's Signature: _____

Date: _____



THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN AGRICULTURE

MODULE I

PRINCIPLES OF CROP PRODUCTION I
AND SOIL SCIENCE

3 hours

INSTRUCTIONS TO CANDIDATES

Write your name and index number in the spaces provided above.

Sign and write the date of the examination in the spaces provided above.

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 spaces provided in this question paper.

All questions carry equal marks.

Maximum marks for each part of a question is as shown.

Do NOT remove any pages from this booklet.

Candidates should answer the questions in English.

For Examiner's Use Only

Question	1	2	3	4	5	6	7	8	TOTAL SCORE
Candidate's Score									

This paper consists of 16 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

Answer any **THREE** questions from this section in the spaces provided.

1. (a) Explain how the following environmental factors influence crop production.
 - (i) Light; (10 marks)
 - (ii) Temperature. (5 marks)
- (b) (i) Outline the establishment procedure of a grass pasture. (5 marks)
(ii) State any five ways of improving crop yields in arid and semi-arid (ASAL) areas. (5 marks)
2. (a) Describe the following practices in crop production.
 - (i) Improved fallow system; (5 marks)
 - (ii) Cultural control of pests. (12 marks)
- (c) Explain the importance of seed dormancy. (3 marks)
3. (a) Explain the aspects of seed viability. (7 marks)
- (b) Using illustrations, differentiate between a single cross from a double cross in plant breeding. (5 marks)
- (c) Outline eight factors to consider in the choice of forage crop for planting. (8 marks)
4. (a) Name the materials used in vegetative propagation of the following crops.
 - (i) Yam;
 - (ii) Lily;
 - (iii) Irish potato;
 - (iv) Kikuyu grass;
 - (v) Banana. (5 marks)
- (b) Outline five external and four internal factors that may influence seed germination. (9 marks)
- (c) Describe three components that constitute yield in grain crops. (6 marks)

5. (a) Outline the role of Kenya plant health inspection services (KEPHIS) in seed trade. (4 marks)
- (b) Discuss the effects of weeds in crop production. (8 marks)
- (c) Discuss benefits of breeding for pest resistance. (8 marks)

SECTION B

Answer any TWO questions from this section in the spaces provided.

6. (a) Outline the properties of soil rich in:
- (i) Hydrous oxides;
- (ii) Vertisols. (12 marks)
- (b) Explain how the following microfauna are beneficial to crop production.
- (i) Root nodule bacteria;
- (ii) Arbuscular mycorrhizal fungi. (8 marks)
7. (a) Explain the difference between horizon A and lower horizons in a soil profile. (8 marks)
- (b) Highlight the factors that influence cation exchange capacity (CEC) of the soil. (8 marks)
- (c) Differentiate between particle density and bulk density of soil. (4 marks)
8. (a) Outline the features of residual parent material in soils. (4 marks)
- (b) Explain how climate influences the profile of residual parent material in soils. (6 marks)
- (c) Describe the properties of 2:1 silicate clays. (10 marks)