Candidate's Name _____ Index No. _____/____

2425/101
PRINCIPLES OF CROP PRODUCTION
AND SOIL SCIENCE
Oct./Nov. 2012
Time: 3 hours

Candidate's Signature _____

Date _____

THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN AGRICULTURE
MODULE I

PRINCIPLES OF CROP PRODUCTION 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 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.*
All questions carry equal marks.
Maximum marks for each part of a question are as shown.
*Do **NOT** remove any pages from this booklet.*

For Examiner's Use Only

Section	Question	Maximum Marks	Candidate's Marks
A			
B			
		TOTAL	

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.

Turn over

OCT/NOV 2012

SECTION A

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

1. (a) Name **six** protein based fodder crops. (3 marks)

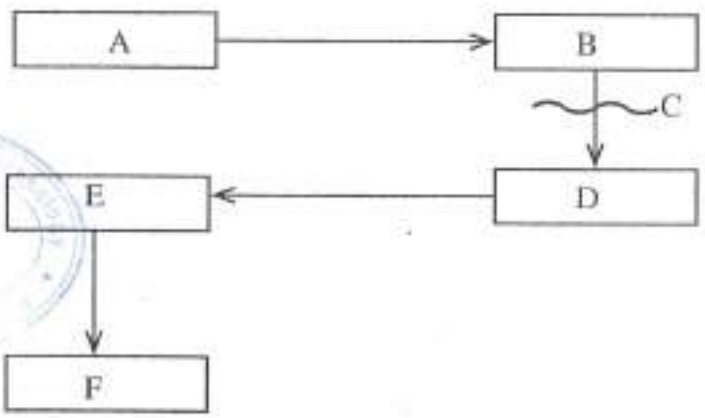
   (b) Describe factors that determine the quality of hay. (5 marks)

   (c) Explain selection objectives for a new crop variety. (12 marks)

2. (a) Describe **five** ways in which problems facing agriculture in Kenya can be reduced. (10 marks)

   (b) Describe the principles of crop protection. (10 mark

3. (a) The following illustration represents a typical seed multiplication programme for a new crop variety.



   Identify the sequence represented by letters A, B, C, D, E, and F. (6 marks)

   (b) Discuss biological pest control. (14 marks)

4. (a) Outline the procedure for preparing containerised agroforestry seedlings from seeds. (6 marks)

   (b) Describe edaphic factors that affect crop production. (14 marks)

5. (a) Explain advantages of biotechnology in crop production. (5 marks)

   (b) Using the plant breeding equation, P = G + E, describe the components of E that will ensure optimum production of hybrid maize variety. (15 marks)

OCT/NOV 2012

32 = 64 P1

SECTION B

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

6. Figure 1 represents the regions of the earth's sphere in relation to soil genesis. Study it and answer the questions that follow.

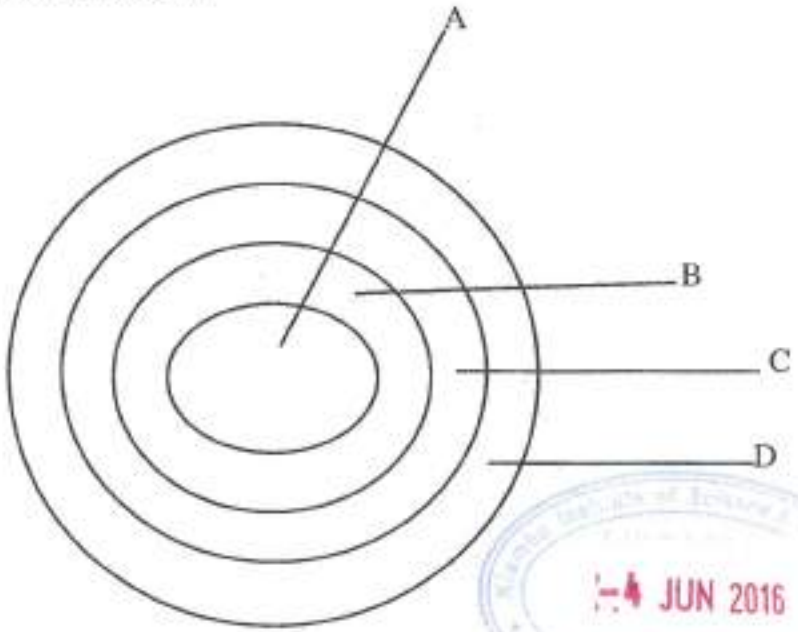


Figure 1 - Regions of the earth's sphere

(a) Identify the regions labelled A, B, C, and D. (4 marks)

(b) Describe the **two** important spheres that contribute to the formation of parent material. (10 marks)

(c) Using equations, illustrate how a single aluminium ion yields three hydrogen ions through hydrolysis reaction. (6 marks)

7. (a) Figure 2 represents a summary of the soil constituents.

Identify the missing components labelled **A**, **B**, **C**, **D**, **E**, **F**, **G** and **H**.

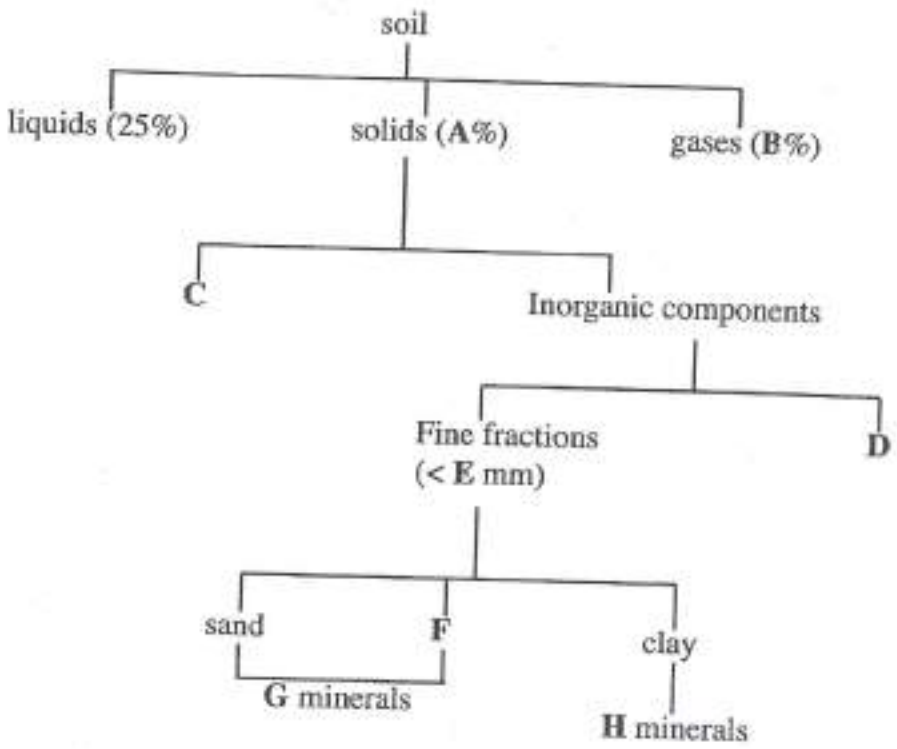


Figure 2 - Summary of the soil constituents

(8 marks)

(b) Describe the factors that affect bulk density of the soil. (12 marks)

8. (a) Explain the soil reaction phenomenon. (6 marks)

(b) Describe the characteristics of vertisols. (14 marks)