CROP PRODUCTION II, SOIL FERTILITY
AND PLANT NUTRITION

SECTION A: (CROP PRODUCTION)

Answer any THREE questions from this section

1. (a) Describe establishment of Tobacco in a nursery from site selection to the stage when seedlings are ready for transplanting.   (10 marks)

    (b) Explain the damage caused by the pests below and their control measures.

        (i)   Cotton Boll worm
        (ii) Bean Cutworm   (10 marks)

2. (a) Discuss the processing operations that affect coffee quality.   (10 marks)

    (b) Describe problems affecting coffee marketing in Kenya.   (10 marks)

3. (a) Describe field management practices in pyrethrum production.   (10 marks)

    (b) Describe the cause, symptoms and management of the following diseases.

        (i)   wood rot in tea   (5 marks)
        (ii) coffee berry disease   (5 marks)

4. (a) Explain FIVE factors that affect sugar cane quality.   (10 marks)

    (b) Explain FIVE factors that determine yields in maize production.   (10 marks)

5. Describe sunflower production from land preparation to harvesting.   (20 marks)

SECTION B (SOIL FERTILITY AND PLANT NUTRITION)

Answer any TWO questions from this section.

6. In an experiment to construct a buffer curve, the following data was obtained.

Beaker Number	Volume of 0.05N $Ca(OH)_2$ added (mls)	Volume of CO_2 free water added (ml)	MeCa(OH)₂ per 100g of soil	pH
1	0	50	-	6.0
2	10	40	-	7.0
3	20	30	-	7.8
4	30	20	-	8.5
5	40	10	-	8.8
6	50	0	-	9.0

Weight of soil added was 5.0g and normality of $Ca(OH)_2$ was 0.05N.

(a) Calculate the miliequivalent (me) of $Ca(OH)_2$ per 100g of soil for each beaker and complete the fourth column. (5 marks)

(b) Construct a buffer curve. (4 marks)

(c) From the graph, determine amount of $Ca(OH)_2$ in me/100g of soil required to change pH to 7.5. Use the above to calculate the amount of calcium carbonate from 6.0 to 7.5 per hectare furrow slice (Use Ca = 40, 0=16, H=1, C=12) (8 marks)

(d) Using chemical equations, explain how calcium carbonate neutralises the soil. (3 marks)

7. (a) Discuss factors that influence the type and amount of fertilizer used. (12 marks)

(b) Determine the amount of

- Mono-ammonium phosphate (11:52:0)
- Ammonium Nitrate (33% N)
- Potassium Muriate (60%K_2O) and filler material that can be used to prepare a compound fertilizer of grade 8:16:16 (8 marks)

8. (a) Explain the influence of organic matter on the soil. (10 marks)

(b) Discuss the factors that affect nutrients availability to plants. (10 marks)