



UNIVERSITY OF SWAZILAND

SUPPLEMENTARY EXAMINATION PAPER

**PROGRAMMES: BACHELOR OF SCIENCE YEAR III IN AGRICULTURAL
EDUCATION, AGRONOMY AND HORTICULTURE**

COURSE CODE: CP 302

TITLE OF PAPER: CROP NUTRITION

TIME ALLOWED: TWO AND A HALF (2.5) HOURS

**INSTRUCTIONS: ANSWER TWO (2) QUESTIONS FROM EACH
SECTION**

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GRANTED BY THE CHIEF INVIGILATOR**

SECTION 1: SOIL CHEMISTRY

QUESTION 1

(a) Outline the nature of charge and their properties in tropical and subtropical soils and comment on the challenges these soils present when used for crop production. [10 marks]

(b) Discuss the strategies to recommend in order to increase the cation exchange capacity of tropical and subtropical soils for better nutrient retention. [15 marks]

QUESTION 2

(a) Describe the types of acidity in soils and indicate their significance in soil science. [6 marks]

(b) Discuss the acid-infertility of soils and suggest practical strategies to increase crop growth in acid soils. [19 marks]

QUESTION 3

Discuss the contribution of organic matter to the quality of soils for agricultural production. [25 marks]

SECTION 2: SOIL FERTILITY

QUESTION 4

(a) Discuss the ways in which nitrogen may be added to soils and comment on the relative importance of each method in nitrogen nutrition of plants. [15 marks]

(b) Discuss the management strategies that one would recommend to improve the efficiency of nitrogen uptake and utilization by plants. [10 marks]

QUESTION 5

(a) Discuss the fertiliser application methods that would be recommended to farmers in your home area for the fertilisation of maize and give the merits and demerits of each method. [13 marks]

(b) A fertiliser recommendation for the production of maize in the highveld of Swaziland was given as follows:

N - 65 kg ha⁻¹

P - 40 kg ha⁻¹

K - 35 kg ha⁻¹

(i) Calculate the amount of the compound fertiliser 2:3:2 (37) required to supply all the three elements in the quantities indicated. [6 marks]

(ii) Indicate the level of success achieved in this regard. [6 marks]

QUESTION 6

(a) Outline the transformation of phosphorus in soils and explain the implications of these transformations on the phosphorus nutrition of plants. [10 marks]

(b) The availability of phosphorus to plants in soils is influenced by a number of factors. Discuss this statement and suggest strategies to recommend to increase phosphorus availability to plants in soils. [15 marks]