UNIVERSITY OF SWAZILAND

SUPPLEMENTARY EXAMINATION PAPER

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PROGRAMME: BACHELOR OF SCIENCE IN AGRICULTURAL
                    EDUCATION
                    BACHELOR OF SCIENCE IN AGRONOMY

COURSE CODE: CP 302

TITLE OF PAPER: CROP NUTRITION

TIME ALLOWED: TWO (2) HOURS

INSTRUCTION: ANSWER A TOTAL OF FOUR [4] QUESTIONS. ALL
                    QUESTIONS CARRY EQUAL MARKS.

DO NOT OPEN THIS PAPER UNTIL PERMISSION HAS BEEN GRANTED
BY THE INVIGILATOR.

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INSTRUCTIONS: **ANSWER ANY FOUR [4] QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.**

QUESTION 1

Answer the questions sequentially as arranged below. There will be a penalty for non-sequential arrangement of answers.

a. Using four named criteria, compare and contrast any three types of clay minerals found in soils in Swaziland.   (4 x 3 marks = 12 marks)

b. Discuss the agricultural importance of clay minerals.   (5 x 3 marks = 15 marks)

[Total marks for Question 1 = 25 marks]

QUESTION 2

Answer the questions sequentially as arranged below. There will be a penalty for non-sequential arrangement of answers.

a. What is soil pH?   (4 marks)

b. Explain why there would be a difference between the results of pH determined by the use of calcium chloride solution and by the use of water?   (4 marks)

c. If a soil has a pH of 3.0 and you wish to plant a crop that requires a soil pH of 6.5, specify what you would do to change the soil pH to suit the crop.   (4 marks)

d. Name four types of materials that you would use to achieve the objective stated in 2(c) above.   (4 x 1 marks = 4 marks)

e. If a farmer cannot change the soil pH to suit the crop, what else can s/he do to use the same piece of land that season?   (4 marks)

f. Discuss the development of acidity in soils.   (5 marks)

[Total marks for Question 2 = 25 marks]

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INSTRUCTIONS: ANSWER ANY FOUR [4] QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

QUESTION 3

Answer the questions sequentially as arranged below. There will be a penalty for non-sequential arrangement of answers.

a. Name <u>four</u> functions of potassium in plants.   (4 x 1 marks = 4 marks)

b. Describe the foliar symptoms of potassium deficiency in maize. (5 marks)

c. Discuss <u>four</u> ways in which potassium is lost in soils. (4 x 1 marks = 4 marks)

d. Discuss <u>four</u> factors that influence potassium availability to plants in soils. (4 x 1 marks = 4 marks)

e. Name two potassium fertilizers (first, state the chemical or trade name, and then state the chemical formula in each case).   (2 x 2 marks = 4 marks)

f. Apart from the use of fertilizers, specify <u>two</u> other ways of adding potassium to soils.   (2 x 2 marks = 4 marks)

[Total marks for Question 3 = 25 marks]

INSTRUCTIONS: **ANSWER ANY FOUR [4] QUESTIONS. ALL**
                          QUESTIONS CARRY EQUAL MARKS.

QUESTION 4

Answer the questions sequentially as arranged below. There will be a penalty for non-sequential arrangement of answers.

    a. State <u>four</u> functions of nitrogen in plants.   (4 x 1 marks = 4 marks)

    b. Describe the foliar symptoms of nitrogen deficiency in maize. (4 marks)

    c. Discuss two fixation pathways for nitrogen in soils. (2 x 4 marks = 8 marks)

    d. Explain the process and role of the Nitrogen cycle in improving soil fertility.

        (8 marks)

    e. Why is nitrogen fertilizer not often applied by broadcasting? (1 mark)

[Total marks for Question 4 = 25 marks]

QUESTION 5

Answer the questions sequentially as arranged below. There will be a penalty for non-sequential arrangement of answers.

a. Discuss <u>four</u> factors that affect the content of organic matter in soils. (4 x 3 marks = 12 marks)

b. Explain <u>four</u> ways in which organic matter affects the physical conditions of the soil. (4 x 3 marks = 12 marks)

c. Name two types of organic matter that can be added to the soil. (2 x 0.5 marks = 1.0 marks).

[Total marks for Question 5 = 25 marks]