



2nd SEM. 2012/2013 (M)

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UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER

PROGRAMME: BACHELOR OF SCIENCE IN AGRONOMY YEAR IV

COURSE CODE: CP 406

TITLE OF PAPER: SOIL MANAGEMENT

TIME ALLOWED: TWO (2) HOURS

INSTRUCTIONS: ANSWER ANY FOUR (4) QUESTIONS

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THE CHIEF INVIGILATOR**

QUESTION 1

(a) A maize farmer in the Middleveld of Swaziland reported getting disappointing yields of maize in a 20-hectare farm which was previously under a 7-year cycle of pineapple production. Discuss the possible reasons for the poor yields of maize in this 20-hectare farm. [12]

(b) Discuss in detail the strategies you would recommend for increased maize yields on this farm. [13]
[25]

QUESTION 2

(a) Differentiate between “exchangeable acidity” and “nonexchangeable acidity” and outline the role each plays in the behaviour of tropical and subtropical soils. [5]

(b) Explain the term “delta pH” and give the basis for (i) a positive delta pH and (ii) a negative delta pH. [5]

(c) Discuss the strategies you would recommend to increase the effective cation exchange capacity of tropical and subtropical soils. [15]
[25]

QUESTION 3

(a) Explain the term “soil salinity” and outline the development of this soil condition. [10]

(b) Discuss the strategies you would recommend to increase crop yields in saline soils. [15]
[25]

QUESTION 4

(a) Account for the observation that even though a lowland rice production system is labour intensive but it remains the most popular among rice farmers covering 87% of land under rice production on a world basis. [12]

(b) Discuss the physical and chemical changes in soil properties after a piece of land is flooded in preparation for lowland rice production.

[13]

[25]

QUESTION 5

Discuss the nature and management requirements of arable soils in the Highveld and Middleveld of Swaziland.

[25]

QUESTION 6

(a) Define the term "soil pollution". [3]

(b) Discuss the reclamation procedures you would recommend for:

(i) Herbicide contaminated soils. [11]

(ii) Heavy metal contaminated soils. [11]

[25]