



2ND SEM. 2004/2005

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UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER

**PROGRAMME: DIPLOMA IN AGRICULTURE YEAR 1 AND
DIPLOMA IN AGRICULTURAL EDUCATION
YEAR 1**

COURSE CODE: CP 103 /

TITLE OF PAPER: INTRODUCTORY SOIL SCIENCE

TIME ALLOWED: TWO (2) HOURS

**INSTRUCTIONS: ANSWER QUESTION ONE (1), WHICH IS A
COMPULSORY QUESTION, AND ANY OTHER
TWO (2) QUESTIONS OF YOUR CHOICE**

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BY THE CHIEF INVIGILATOR**

QUESTION 1: COMPULSORY

- (a) The following information was obtained from a chemical analysis of a soil:

Exchangeable Ca	-	400 ppm
Exchangeable Mg	-	240 lbs ac ⁻¹
Exchangeable K	-	436.8 kg ha ⁻¹
Exchangeable Na	-	11.5 mg/100g
Exchangeable H	-	120 lbs ac ⁻¹
Exchangeable AL	-	450 ppm

Equivalent weights: Ca – 20, Mg – 12, K – 39, Na – 23,
AL – 9, H – 1.

- i) Calculate the cation exchange capacity of this soil [10]
- ii) What is the percent base saturation for this soil? [5]
- iii) Evaluate this soil in terms of its suitability as a medium for plant growth. [5]
- (b) i) What is a factor of soil formation [5]
- ii) Discuss the factors of soil formation and show how they have influenced soil formation in soils of your country. [15]
- [40]

QUESTION 2

- (a) Define the term “organic matter” [5]
- (b) Discuss the functions of organic matter which are important when soils are used for crop production [25]
- [30]

QUESTION 3

- (a) Define the term “soil horizon” and indicate how horizons are named in a soil profile [8]
- (b) Using a suitable diagram, illustrate the major soil horizons in a representative mineral soil and describe the properties of each horizons. [22]
[30]

QUESTION 4

- (a) Outline the importance of soil structure in crop production [8]
- (b) Discuss the management strategies you would recommend to improve or maintain good soil structure. [22]
[30]