

**UNIVERSITY OF SWAZILAND
DEPARTMENT OF GEOGRAPHY, ENVIRONMENTAL SCIENCE AND
PLANNING
FINAL EXAMINATION, DECEMBER 2007**

TITLE OF PAPER: APPLIED SOIL SCIENCE

COURSE CODE: GEP 433

TIME ALLOWED: THREE HOURS

**INSTRUCTIONS: ANSWER QUESTION ONE AND ANY
OTHER TWO QUESTIONS FROM
SECTION B**

**MARKS ALLOCATED: QUESTION 1 CARRIES 40 MARKS. THE
OTHER QUESTIONS CARRY 30 MARKS
EACH.**

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BY THE INVIGILATOR**

SECTION A

QUESTION 1 (COMPULSORY)

- a) The Manzini City Council intends to set up a landfill where municipal solid waste will be disposed and you have been approached for advice. Assuming that the suitability of the site depends on the soils alone, explain how knowledge of soil science would help you identify an appropriate location for this landfill. (30 marks)
- b) If instead of a landfill, they are interested in a septic tank drain field, how will the properties of interest differ from those considered for the siting of landfills? (10 marks)
- (40 marks)**

SECTION B

ANSWER ANY TWO QUESTIONS

QUESTION 2

A farmer has 5 km² piece of land on which he wants to invest a huge sum of money. He consults you as a soil surveyor for advice.

- a. Describe the type of soil survey you would consider for this field and give reasons for your choice. (10 marks)
- b. Explain how you would select your observation sites. (10 marks)
- c. Identify an appropriate soil mapping unit that you would use and give reasons for your choice of mapping unit. (5 marks)
- d. What system of soil classification would be most appropriate? Give reasons. (5 marks)
- (30 marks)**

QUESTION 3

Discuss the application of soil survey in developed and developing countries, highlighting their similarities and differences. (30 marks)

QUESTION 4

Discuss the role of soil science in the field of engineering.

(30 marks)

QUESTION 5

a. Explain how the following factors affect soil erosion.

(i) Climate.

(5 marks)

(ii) Soil structural stability.

(5 marks)

(iii) Soil infiltration capacity.

(5 marks)

b. Describe any two (2) land management practices in Swaziland and their effect on soil erosion.

(15 marks)

(30 marks)