

**THE UNIVERSITY OF SWAZILAND**

**FINAL EXAMINATION MAY 2012**

**B.Sc. IV**

**TITLE OF PAPER: APPLIED SOIL SCIENCE**

**COURSE NUMBER : GEP 433**

**TIME ALLOWED : THREE [3] HOURS**

**INSTRUCTIONS : ANSWER QUESTION ONE [1] WHICH IS A  
COMPULSORY QUESTION AND ANY TWO QUESTIONS  
OF YOUR CHOICE.**

**MARKS ALLOCATED : QUESTION ONE [1] CARRIES FORTY [40] MARKS AND  
THE OTHER QUESTIONS CARRY THIRTY [30] MARKS  
EACH.**

**THIS PAPER SHOULD NOT BE OPENED UNTIL PERMISSION HAS BEEN  
GRANTED BY THE CHIEF INVIGILATOR.**

**SECTION A: COMPULSORY QUESTION**

**QUESTION 1**

- a) Give a definition of “soil” from a pedological perspective. [5]
- b) Briefly discuss the following morphological parameters used in the characterization of a soil profile:
- i) Soil structure [5]
  - ii) Soil consistence [5]
  - iii) Soil colour [5]
- c) Identify and briefly discuss any four [4] soil forming factors [20]

[40]

**SECTION B**

**ANSWER ANY TWO QUESTIONS FROM THIS SECTION**

**QUESTION 2**

- a) Give a definition of “master soil horizon” [6]
- b) Discuss the following master soil horizons:
- i) A-horizon [12]
  - ii) O-horizon [12]

[30]

**QUESTION 3**

Briefly discuss the following pedogenic processes:

- i) Leaching [10]
- ii) Illuviation [10]
- iii) Pedoturbation [10]

[30]

**QUESTION 4**

Discuss applications of soil surveys in sparsely settled or empty areas under the following topics:

- i) Resource inventory and project location [10]
- ii) Project feasibility [15]
- iii) Management [5]

[30]

**QUESTION 5**

Briefly discuss the mechanisms or processes that bring about the formation of the following parent materials including their characterization.

- i) Colluvium [10]
- ii) Loess [8]
- iii) Glacial till [12]

[30]