

THE UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER 2014

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 texture [5]
 - iii) Soil consistence [5]
 - c) Identify and discuss any four [4] soil forming factors including their interactions where necessary. [20]
- [40]

SECTION B

ANSWER ANY TWO QUESTIONS FROM THIS SECTION

QUESTION 2

- a) Give the definition of "master soil horizon" [6]
 - b) Discuss the following master soil horizons with particular reference to the processes and sequences involved during their evolution.
 - i) A - horizon [12]
 - ii) B - horizon [12]
- [30]



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QUESTION 3

Briefly discuss the following pedogenic processes, highlighting the locations and conditions under which they are most likely to occur.

- i) Leaching [10]
 - ii) Illuviation [10]
 - iii) Eluviation [10]
- [30]

QUESTION 4

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

- i) Resource inventory and project location [10]
 - ii) Project feasibility [15]
 - iii) Project planning [5]
- [30]

QUESTION 5

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

- i) Colluvium [10]
 - ii) Alluvium [10]
 - iii) Glacial till [10]
- [30]