

THE UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER MAY 2015

B.Sc. YEAR IV AND B.ED. YEAR 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 FORTY [40] MARKS AND ONE [1] CARRIES
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) Discuss any four [4] soil forming factors including their interactions. [20]
- [40]

SECTION B

ANSWER ANY TWO QUESTIONS FROM THIS SECTION

QUESTION 2

- a) Give the definition of a “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]

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 the applications of soil surveys in empty or sparsely settled areas for the following purposes:

- | | | |
|--|------|------|
| 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) Loess | [10] | |
| | | [30] |