

UNIVERSITY OF ESWATINI



SEMESTER 2 MAIN EXAMINATION PAPER, AUGUST 2020

B.Ed. Sci. & BSc.

FACULTY OF SCIENCE AND ENGINEERING

DEPARTMENT OF GEOGRAPHY, ENVIRONMENTAL SCIENCE AND PLANNING

COURSE CODE: GEP416

PAPER TITLE: APPLIED SOIL SCIENCE

TIME ALLOWED: Three (3) Hours

ANSWER THREE QUESTIONS

2. QUESTION 1 IS COMPULSORY

3. ILLUSTRATE YOUR ANSWERS WITH
EXAMPLES AND CLEARLY DRAWN DIAGRAMS
WHERE APPROPRIATE

ALLOCATION OF MARKS: QUESTION 1 (COMPULSORY) CARRIES
40 MARKS WHILE THE REST CARRY 30
MARKS EACH

Candidates may complete the front cover of their answer book when instructed by the Chief Invigilator and sign their examination attendance card but must NOT write anything else until the start of the examination period is announced.

No electronic devices capable of storing and retrieving text, including dictionaries and any form of foreign material may be used while in the examination room

DO NOT Turn examination paper over until instructed to do so

GEP 416: APPLIED SOIL SCIENCE – AUGUST 2020

SECTION A: COMPULSORY

QUESTION 1

- a) Discuss the following parameters of soils in relation to their applicability to agriculture:
- i). Porosity (5 marks)
 - ii). CEC (5 marks)
- b) Discuss the following properties of soils in relation to their applicability to engineering (civil or geotechnical):
- i). Permeability (5 marks)
 - ii). Compressibility (5 marks)
- c) 'In farming, farmers are generally interested in the soil's properties'. Discuss these properties of soil in relation to their applicability to farming. (20 marks)
- (40 Marks)**

SECTION B: ANSWER ANY TWO QUESTIONS

QUESTION 2

Discuss all the factors influencing soil formation and how they interact in the development of different soils around the world. (30 Marks)

QUESTION 3

- a) Compare and contrast between a master soil horizon and a diagnostic horizon. (10 marks)
- b) Discuss the properties of vertisols and highlight the difficulty or ease of construction of transport infrastructure on such soils. (20 marks)
- (30 Marks)**

QUESTION 4

Discuss five pedogenic processes that act on soils on a macro-scale (global scale), highlighting the locations and conditions under which they are most likely to occur. (30 Marks)

QUESTION 5

Illustrate your understanding of soil classification systems by comparing and contrasting Soil Taxonomy and World Reference Base. (30 Marks)