



**UNIVERSITY OF SWAZILAND**

**SPECIAL EXAMINATION PAPER**

**PROGRAMMES: BACHELOR OF SCIENCE IN AGRICULTURAL AND  
BIOSYSTEMS ENGINEERING, AGRICULTURAL  
EDUCATION, AGRONOMY, ANIMAL SCIENCE, ANIMAL  
SCIENCE DAIRY OPTION AND HORTICULTURE.**

**COURSE CODE: CPR 205**

**TITLE OF PAPER: INTRODUCTORY SOIL SCIENCE**

**TIME ALLOWED: TWO (2) HOURS**

**INSTRUCTIONS: ANSWER ALL QUESTIONS**

**DO NOT OPEN THIS PAPER UNTIL PERMISSION HAS BEEN GRANTED BY  
THE CHIEF INVIGILATOR**

**QUESTION 1**

- (a) What is the role of soil structure in crop production? [10]
- (b) Discuss the management practices that can be recommended to maintain or improve the structure of a soil. [15]  
[25]

**QUESTION 2**

- (a) Describe the various ways by which soil colloids obtain negative charges [7]
- (b) Discuss the properties of clay minerals which are important for crop production. [18]  
[25]

**QUESTION 3**

- (a) Define the term "soil horizon" [5]
- (b) Explain how horizons are identified and named in a soil profile [5]
- (b) Using an appropriate diagram, illustrate the major horizons in a representative mineral soil profile and describe the properties of each. [15]  
[25]

**QUESTION 4**

Define the following terms: (Each question carries 2 marks)

- (i) Mechanical analysis
- (ii) Soil genesis
- (iii) Symbiotic nitrogen fixation
- (iv) Ion exchange
- (v) Illuviation

- (b) Discuss the processes of soil formation, clearly indicating the significance of each process in the development of soils