



Great Zimbabwe University  
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EXAMINATIONS OFFICE

**DEPARTMENT OF SOIL AND PLANT SCIENCES**

**GARY MAGADZIRE SCHOOL OF AGRICULTURE**

**BACHELOR OF SCIENCE DEGREE**

**LEVEL 1 SEMESTER 1**

**EXAMINATION QUESTION PAPER**

|                          |                                     |
|--------------------------|-------------------------------------|
| <b>MODULE CODE:</b>      | <b>ASS 111</b>                      |
| <b>MODULE NARRATION:</b> | <b>Introduction of Soil Science</b> |
| <b>DATE</b>              | <b>2024</b>                         |
| <b>DURATION</b>          | <b>3 HOURS</b>                      |

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**INSTRUCTIONS TO CANDIDATES:**

1. Answer any **FOUR** questions
2. Each question carries **25 marks**
3. There are 2 printed pages

1. (a) A clay soil sample collected from the field weighed 200g. After oven drying it weighed 190g. The volume of core used to collect the sample is 100cm<sup>3</sup>.
  - i) Calculate the bulk density of this soil. [5]
  - ii) Given that the particle density of this soil is 2g/cm<sup>3</sup>, calculate its porosity. [5]
- (b) Explain the significance of the following soil parameters:
  - i) Cation Exchange capacity. [5]
  - ii) Soil pH. [5]
  - iii) Soil texture [5]
2. (a) A farmer has been consistently using heavy machinery on his farm. Discuss three (3) physical soil properties negatively affected by continuous machinery use. [15]
- (b). Explain five (5) causes of soil alkalinity. [10]
3. (a) Discuss how organic matter influence any three (3) soil properties. [15]
- (b) Discuss how clay mineralogy influence soil fertility and soil water management [10]
4. (a) Discuss any three soil forming factors. [15]
- (b) Explain five factors that influence soil microbial populations [10]
5. i) Discuss the significance of the following process in relation to soil fertility.
  - a) Mineralization [5]
  - b) Denitrification [5]
  - (c) Isomorphous substitution [5]
  - (d) Podzolization [5]
- ii) Explain the significance of soil salinity in plant nutrition. [5]
6. (a) Briefly explain 5 processes that result in soil acidification. [10]
- (b) Distinguish between 1:1 kaolinite and 2:1 smectite clays. [10]
- (c) Explain the importance of soil classification. [5]

**END OF EXAMINATION PAPER**