



# MACHAKOS UNIVERSITY

University Examinations for 2018/2019 Academic Year

SCHOOL OF AGRICULTURAL SCIENCES

DEPARTMENT OF AGRICULTURAL EDUCATION AND EXTENSION

FIRSTYEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE IN AGRICULTURAL EDUCATION AND EXTENSION

SOL 100 INTRODUCTION TO SOIL SCIENCE

DATE: 23/7/2019

TIME:8.30-10.30 AM

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## INSTRUCTIONS:

Answer question ONE and ANY TWO questions

### QUESTION ONE

- a) Explain the two basic building blocks of a clay soil structure (2 marks)
- b) Differentiate between eluviation and illuviation (2 marks)
- c) Using examples, describe three different types of tetrahedral sheets (6 marks)
- d) Explain the following terms
  - i) Pedology (2 marks)
  - ii) Soil survey (2 marks)
  - iii) Chemo-autotrophs (2 marks)
- e) Describe three mechanisms by which nutrients move from the soil to the surface of the plant root (6 marks)
- f) Describe two categories of bacteria according to nutrition requirements (4 marks)
- g) Giving examples, differentiate between an essential element and a beneficial element (2 marks)
- h) Using a sponge as an example, explain what is meant by field capacity (2 marks)

**SECTION B: 40 MARKS (Answer any two questions)**

**QUESTION TWO**

- a) Using scales, identify five types of surveys in Kenya (10 marks)
- b) Describe any five sets of soils according to the world reference base for soil classification (WRB) giving relevant examples (10 marks)

**QUESTION THREE**

- a) Explain five possible causes low microbial population in the soil (10 marks)
- b) Discuss five factors influencing water holding capacity of soil (10 marks)

**QUESTION FOUR**

- a) Discuss five soil management measures which should be done to manage soil compaction (10 marks)
- b) With aid of diagrams, describe five types of soil structure (10 marks)

**QUESTION FIVE**

- a) As an extension officer, explain five measures you would advise farmers to adopt in improving the level of soil organic matter content in the soil (10 marks)
- b) Explain five factors affecting soil aggregate stability (10 marks)