



UNIVERSITY EXAMINATIONS FOR THE AWARD OF THE DEGREE OF
BACHELOR OF SCIENCE IN DRYLAND AGRICULTURE
2021/2022 ACADEMIC YEAR
MAY SEMESTER 2022

UNIT CODE: LADM 2104

UNIT TITLE: BASIC SOIL SCIENCE

DATE: JULY 2022

TIME: 2 HOURS

INSTRUCTIONS

1. Answer **question one** and **any other two** questions
2. Do **not** write anything on this question paper
3. Do **not** write in the page margins of the answer booklet
4. Begin each question answer on a new page

QUESTION 1 (COMPULSORY) (30 MARKS)

- a) Describe soil organic matter (2 marks)
- b) You are required to give a speech on the importance of soil structure to form four students at Kasikeu Secondary school in Makueni County. Explain three key points that would form part of your speech. (6 marks)
- c) Discuss how sedimentary rocks are formed (6 marks)
- d) Evaluate three key factors that influence cation exchange capacity (CEC) (6 marks)
- e) Citing examples, explain five factors that influence soil formation (10 marks)

QUESTIONS TWO (20 MARKS)

- a) Enumerate six beneficial effects of soil microbes. (6 marks)
- b) Citing examples, explain six functions of global soil ecosystems (6 marks)
- c) Discuss the four conditions that influence microbial activity and growth. (8 marks)

QUESTION THREE (20 MARKS)

- a) Outline four reasons why soil testing is considered very important in farming activities. (4 marks)
- b) Explain four key advantages of using Organic Fertilizers in crop production (8 marks)
- c) Citing examples, discuss four main categories of nutritive elements that are essential to plant life. (8 marks)

QUESTION FOUR (20 MARKS)

- a) Explain the following phrases as used in basic soil science
 - i. Aluminum toxicity (2 marks)
 - ii. Lime requirement (LR) (2 marks)
- b) Explain four factors that determine lime requirement (LR) (8 marks)
- c) Using a suitable illustration, account for major components of an ideal soil sample. (8 marks)

QUESTION FIVE (20 MARKS)

- a) Account for four causes of soil acidity. (8 marks)
- b) Discuss why scientists argue that in soil, death doesn't stop the spread of antibiotic resistance. (6 marks)
- c) Soil Scientists state that earthworms have the potential to replace use of synthetic fertilizers. Justify. (6 marks)