



MACHAKOS UNIVERSITY

University Examinations for 2021/2022 Academic Year

SCHOOL OF AGRICULTURE, ENVIRONMENT AND HEALTH SCIENCES

DEPARTMENT OF AGRICULTURAL SCIENCES

FIRST YEAR SPECIAL / SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE IN AGRICULTURAL EDUCATION AND EXTENSION

BACHELOR OF EDUCATION (SCIENCE)

BACHELOR OF EDUCATION (SPECIAL EDUCATION)

SOL 100: INTRODUCTION TO SOIL SCIENCE

DATE: 30/8/2022

TIME: 8.30-10.30 AM

INSTRUCTIONS:

Answer *ALL* questions from Section A and any other *TWO* from Section B:

SECTION A: COMPULSORY: (30 MARKS)

QUESTION ONE

- a) Explain TWO situations under which salinity is increased in the soil (2 marks)
- b) Describe the effect of leaching on soil pH (4 marks)
- c) Explain FOUR factors that influence soil structure development (4 marks)
- d) Giving an example in each case, differentiate between primary and secondary minerals (4 marks)
- e) Explain the TWO aspects of topography that affect soil formation (4 marks)
- f) Describe the FOUR subdivisions of soil fauna (4 marks)
- g) Explain FOUR roles of humus in the soil (4 marks)
- h) Describe the TWO major sources of charges on soil colloids (4 marks)

SECTION B: Answer any TWO Questions (40 Marks)

QUESTION TWO (20 MARKS)

Discuss the effects of the below stated factors in the soil forming process

- a) Wind (10 marks)
- b) Biological activity (10 marks)

QUESTION THREE (20 MARKS)

- a) Explain the importance of soil structure in crop production (10 marks)
- b) Discuss FIVE factors influencing cation exchange capacity (CEC) (10 marks)

QUESTION FOUR (20 MARKS)

- a) Explain the roles of bacteria in the soil (10 marks)
- b) Explain any five types of soil surveys based on scale of mapping (10 marks)

QUESTION FIVE (20 MARKS)

Discuss the following soil forming processes

- a) Mineral dissolution (5 marks)
- b) Greying (5 marks)
- c) Cheluviation (5 marks)
- d) Podzolation (5 marks)