



MACHAKOS UNIVERSITY

University Examinations for 2016/2017

SCHOOL OF AGRICULTURE AND NATURAL RESOURCES MANAGEMENT

DEPARTMENT OF AGRICULTURAL EDUCATION AND EXTENSION

FIRST YEAR SECOND SEMESTER EXAMINATION FOR BACHELOR OF
SCIENCE IN AGRICULTURAL EDUCATION AND EXTENSION

SOL 100: INTRODUCTION TO SOIL SCIENCE

DATE: 30/5/2017

TIME: 2:00 – 4:00 PM

INSTRUCTIONS:

- i. Answer Question ONE and ANY other Two Questions*
- ii. Do not write on the question paper.*
- iii. Mobile phones, computers and apple pads are not permitted in the examination rooms.*

SECTION A:

QUESTION ONE 30MKS COMPULSORY

- a) Differentiate between
 - i Soil texture and soil structure (3 marks)
 - ii Field capacity Moisture and Plant-available moisture (3 marks)
 - iii Eluviation and Illuviation (3 marks)
- b) Differentiate four types of soil structure (2 marks)
- c) Explain the difference between primary and secondary soil minerals. (6 marks)
- d) List three types of rocks and briefly explain how each is formed (6 marks)
- e) Explain how topography influences soil formation (4 marks)
- f) Explain the process of isomorphous substitution. (3 marks)

SECTION B 40 MKS ANSWER ANY TWO QUESTIONS

QUESTION TWO (20 MARKS)

- a) Explain four ecological functions of soil biota (6 marks)
- b) Identify four (4) microorganisms responsible for biological nitrogen fixation (4 marks)
- c) Explain the importance of the soil organic matter (10 marks)

QUESTION THREE (20 MARKS)

- a) Give the deficiency symptoms of;
 - i) Phosphorus (3 marks)
 - ii) Nitrogen (3 marks)
- b) Explain three processes by which nutrients move through the soil to plant roots (6 marks)
- c) By equations show how sulphate of ammonia is transformed by nitrosomonas and nitrobacter to aggravate acidity in an acid soil (8 marks)

QUESTION FOUR (20 MARKS)

- a) Explain the meaning of Soil erosion in crop production (2 marks)
- b) Explain any five causes of accelerated soil erosion on farmlands (5 marks)
- c) Briefly explain the measures that can be used to control soil erosion (9 marks)
- d) State four causes of soil salinity (4 marks)

QUESTION FIVE (20 MARKS)

- a) Explain four purposes of soil classification (4 marks)
- b) Identify 6 types of soil survey (6 marks)
- c) Using diagrammatic illustrations, describe the soil profile (10 marks)