



MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)

University Examinations 2015/2016

SCHOOL OF AGRICULTURE AND NATURAL RESOURCES MANAGEMENT

DEPARTMENT OF ENVIRONMENTAL STUDIES

FIRST SEMESTER EXAMINATION FOR DEGREE IN BACHELOR OF SCIENCE IN
ENVIRONMENTAL RESOURCE CONSERVATION

ENS 233: SOIL HABITATS

Date: 26/4/2016

Time: 2:00 – 4:00 pm

INSTRUCTIONS

This paper consists of FIVE questions

Answer question one and any other two questions in this B

SECTION A: 30 MARKS

QUESTION ONE

- a) Define the following (5 marks)
- Soil
 - Isomorphous substitution
 - Soil colloid
 - Soil aggregate
 - Aggregate stability
- b) Highlight five ways of preventing soil compaction (5 marks)
- c) State two sources of heavy metals in soils (2 marks)
- d) Explain three characteristics of heavy metal contamination in soils. (6 marks)
- e) Highlight five types of bacteria in the soil. (5 marks)
- f) Describe the four soil components. (4 marks)
- g) Describe three organic layers in soil. (3 marks)

SECTION B: 40 MARKS

QUESTION TWO

- a) Discuss five factors affecting aggregate stability in soils (10 marks)
- b) Discuss five factors affecting quantity of soil organic matter (10 marks)

QUESTION THREE

- a) Differentiate between permanent charge and variable charge (2 marks)
- b) Discuss the four basic processes involved in soil formation (8 marks)
- c) Briefly discuss five soil physical properties (10 marks)

QUESTION FOUR

- a) Differentiate between elluviation and illuvation. (2 marks)
- b) Briefly explain four engineering methods used in remediation of heavy metal contamination in the soil. (8 marks)
- c) Discuss five threats to soil biodiversity (10 marks)

QUESTION FIVE

- a) With respect to chemical reactions in the soil state sources of charge in
 - i. Clay (1 mark)
 - ii. Humus (1 mark)
- b) Briefly discuss five factors affecting soil formation. (10 marks)
- c) State two basic building blocks in the formation of soil. (2 marks)
- d) Briefly discuss bioremediation of heavy metals in the soil. (6 marks)