MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)
University Examinations for 2015/2016 Academic Year

SCHOOL OF AGRICULTURE & NATURAL RESOURCES

DEPARTMENT OF AGRICULTURE

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

KCU 202: PRINCIPLES OF SOIL SCIENCE

Date: 9/12/2015 **Time:**

INSTRUCTIONS:

Answer Three (3) Questions. Question One Is Compulsory.

QUESTION ONE

a) Explain the following terminologies as applied in soils. (10 Marks)

i. Soil bulk density.
ii. Soil structure. .
iii. Permanent wilting point (Wilting point).
iv. Colluvium.
v. Soil reaction

b) Explain 4 factors that affect the availability of plant nutrients in soils. (6 Marks)

c) State the three (3) factors that affect or influence Cation Exchange Capacity (CEC) in the soil. (6 Marks)

d) List the four main soil properties that affect porosity (4 Marks)

e) Explain why stems and leaves decompose at different rates. (4 Marks)

QUESTION TWO

a) Explain the three primary functions of soil in sustaining plant life. (6 Marks)

b) What is the importance of isomorphous substitution in agriculture and /or environmental Protection? (4 Marks)

c) Explain the three chemical cycling processes or stages in soil mineralization. (6 Marks)

d) Explain how nitrogen in the soil is replenished after uptake by plants? (4 Marks)

QUESTION THREE

a) Explain the meaning of the term soil horizon? (2 Marks)

b) By use of a well labeled diagram, describe a soil profile of a given area (8 Marks)

c) Explain the five (5) main factors that influence the soil formation. (10 Marks)

QUESTION FOUR

a) What is soil compaction (2 Marks)

b) Explain 4 advantages and 4 disadvantages of soil compaction on crop production or yields. (12 Marks)

(c.) Describe the four components that make up an ideal soil matrix. (6 Marks)

QUESTION FIVE

a) Outline 5 roles played by soil organisms during soil development. (10 Marks)

b) Give two (2) reasons why most soil dwelling organisms are located within the top 2 – 3 centimeters within the soil profile? (4 Marks)

c) Explain 3 ways used by plants to cope with declining phosphorous quantities in the soils. (6 Marks)