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 DIPLOMA IN AGRICULTURAL EDUCATION AND EXTENSION

KCU 0101: INTRODUCTORY SOIL SCIENCE

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

INSTRUCTIONS:

Answer question 1 and two other questions.

1. (a) Explain the following terminologies as applied in soils. (10 Marks)
   - (i) Soil profile
   - (ii) Hygroscopic water.
   - (iii) Perched water table.
   - (iv) Cation exchange capacity (CEC).
   - (v) Symbionts.

   (b) What is the importance of soil porosity? (4 Marks)

   (c.) Explain how arable lands are grouped in terms of Land capability classification (6 Marks)

   (d). Explain 5 roles played by organic matter in the maintenance of soil fertility. (10 Marks)

2. (a) Explain any three (3) important functions of phosphorous in plants (6 Marks)

(b) By giving examples, differentiate between plant mineral macronutrients and micronutrients. (4 Marks)

(d) Outline 5 functions or roles performed by soils. (10 Marks)

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

(b) Explain how each of the following influences the temperature of soil in a given area. (4 Marks)

(c) Explain how long term fertilizer use can disrupt plant-microbe mutualisms. (6 Marks)

4. (a) Explain the term soil compaction (2 Marks)

(b) Outline 3 advantages of soil compaction with respect to crop yields. (6 Marks)

(c) What are the four components that make up an ideal soil matrix? (4 Marks)

(d) Explain the role played by the maintenance of vegetative cover in soil management. (8 Marks)

5. (a) Give five (5) the characteristics or properties of a good woody / perennial tree for soil improvement. (10 Marks)

(b) List four soil structures (aggregates) of soils. (4 Marks)

(c) By giving examples, explain what the meaning of high quality plant residues is. (6 Marks)