



MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)

University Examinations 2015/2016 Academic Year

SCHOOL OF AGRICULTURE AND NATURAL RESOURCES MANAGEMENT

DEPARTMENT OF AGRICULTURAL EDUCATION AND EXTENSION

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

KRM 300: SOIL FERTILITY AND PLANT NUTRITION

DATE: 1/8/2016

TIME: 8.30-10.30 AM

INSTRUCTIONS:

Answer ALL questions in section A and ANY TWO questions in section B

Section A: 30 MARKS (COMPULSORY)

QUESTION ONE:

- a) Explain the following terms
 - i. Soil fertility (2 marks)
 - ii. Beneficial element (2 marks)
 - iii. Soil conservation (2 marks)
 - iv. Isomorphous substitution (2 marks)
- b) Explain three methods of fertilizer application (6 marks)
- c) Explain three different organic layers in soil (6 marks)
- d) Describe three mechanisms by which nutrients move from the soil to the surface of the plant root (6 marks)
- e) Explain four ways potassium (K^+) is lost from the soil (4 marks)

QUESTION TWO

- a) Explain the functions of the following plant elements
 - i. Boron (5 marks)
 - ii. Potassium (5 marks)
- b) Explain the deficiency symptoms of the following plant elements as observed in plants
 - i. Nitrogen (5 marks)
 - ii. Calcium (5 marks)

QUESTION THREE

- a) Explain five factors affecting nitrification of ammonium nitrogen ($\text{NH}_4^+\text{-N}$) in soils (10 marks)
- b) Explain five factors influencing quantity of soil organic matter (10 marks)

QUESTION FOUR

With the aid of a diagram explain the following:

- a) Carbon cycle (10 marks)
- b) Phosphorus cycle (10 marks)

QUESTION FIVE

- a) Explain five methods used in classification of fertilizers (10 marks)
- b) Explain five soil factors affecting plant growth (10 marks)