MACHAKOS UNIVERSITY

University Examinations for 2021/2022 Academic Year

SCHOOL OF AGRICULTURE, ENVIRONMENT AND HEALTH SCIENCES

DEPARTMENT OF AGRICULTURAL SCIENCES

SECOND YEAR SPECIAL / SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE IN AGRICULTURAL EDUCATION AND EXTENSION

BACHEOR OF EDUCATION (SCIENCE)

BACHELOR OF EDUCATION (SPECIAL NEEDS EDUCATION)

SOL 201: SOIL FERTILITY AND PLANT NUTRITION

DATE: 26/8/2022 **TIME: 2.00-4.00 PM**

INSTRUCTIONS:

Answer *ALL* questions from Section A and any other *TWO* from Section B:

SECTION A: COMPULSORY: (30 MARKS)

QUESTION ONE (30 MARKS)

a) All productive soils are fertile, but all fertile soils need not be productive. Explain this statement using two clear arguments. (2 marks)

b) Describe FOUR steps in making compost manure (4 marks)

c) Describe FOUR deficiency symptoms of nitrogen in a plant (4 marks)

d) Describe the TWO mechanisms of ion uptake by plant roots (4 marks)

e) Explain two differences between plant nutrition and fertilization as used in soil management (4 marks)

f) Explain FOUR roles of organic matter in the soil (4 marks)

g) Explain TWO differences in symptoms caused by nutritional deficiency in plants as opposed to those arising from pests/diseases attack (4 marks)

h) Describe FOUR methods used in application of solid inorganic fertilizers (4 marks)

SECTION B: Answer any TWO Questions (40 Marks)

QUESTION TWO (20 MARKS)

a) Explain **FIVE** limitations of visual diagnosis of plant nutrients (10 marks)

b) Discuss FIVE methods of amending alkaline soils (10 marks)

QUESTION THREE (20 MARKS)

a) Explain FIVE factors affecting timing of fertilizer application (10 marks)

b) Discuss FIVE factors affecting nutrient uptake in a plant (10 marks)

QUESTION FOUR (20 MARKS)

a) With aid of a well labelled diagram, describe phosphorus fixation in plants through the endomycorrhizal interaction (10 marks)

b) With the aid of a well labelled diagram, explain the Raviv and Leith nutrient curve (10 marks)

QUESTION FIVE (20 MARKS)

a) Describe the steps in preparation of farm yard manure (12 marks)

b) Explain the FOUR transformation processes involved in nutrient cycling (8 marks)