



(Knowledge for Development)

KIBABII UNIVERSITY
UNIVERSITY EXAMINATIONS
2019/2020 ACADEMIC YEAR

SECOND & THIRD YEAR 1ST SEMESTER
SPECIAL/SUPPLEMENTARY EXAMINATION

FOR THE DEGREE OF BACHELOR OF SCIENCE AGRICULTURE AND BIOTECHNOLOGY, BACHELOR OF SCIENCE AGRICULTURE EDUCATION AND EXTENSION, BACHELOR OF SCIENCE AGRICULTURE ECONOMICS AND RESOURCE MANAGEMENT & BACHELOR OF EDUCATION SCIENCE

COURSE CODE: ASS 222 / SAB 311

COURSE TITLE: SOIL FERTILITY AND PLANT NUTRITION

DATE: 04/02/2021.

TIME: 8-10 AM.

INSTRUCTIONS TO CANDIDATES

Answer Question ONE and any other TWO Questions.

TIME: 2 Hours

This paper consists of 3 printed pages. Please Turn Over

KIBU observes ZERO tolerance to examination cheating

QUESTION ONE (COMPULSORY)

- a) Distinguish between Active and Passive Nutrient uptake (2 Marks)
- b) Briefly define Integrated Soil Fertility Management (ISFM). (3 Marks)
- c) State three major functions of Molybdenum and three of its visual deficiency symptoms (6 Marks)
- d) Field diagnosis requires clear understanding of the varied plant leaf symptoms for better visual diagnosis. Give the classification of these symptoms. (5 Marks)
- e) Define Rhizosphere and briefly explain the functions of root exudates. (14 Marks)

QUESTION TWO

Differentiate between C3 and C4 plants in relation to plant nutrition. (20 marks)

QUESTION THREE

- a) Muriate of Potash contains 60% K_2O . What percent potassium (K) does this correspond? (5 marks)
- b) Describe the procedure of collecting a composite sample (5 marks)
- c) Discuss the importance of soil sampling and testing. (10 Marks)

QUESTION FOUR

Describe the following Laws/Equations and state their importance in plant nutrition

- Fick's Law (5 Marks)
- Nernst Equation (5 Marks)
- Michaelis-Menten Equation (5 Marks)
- Shearer and Kohl Equation (5 Marks)

QUESTION FIVE

a) With the help equations, explain the following Nitrogen cycle processes:

- i) Volatilization. (2 Marks)
- ii) Nitrification. (2 Marks)
- iii) Immobilization. (2 Marks)
- iv) Ammonification. (2 Marks)
- v) Denitrification. (2 Marks)

b) Differentiate between Ammonium fixation and Phosphorus fixation. (4 marks)

c) Discuss the conditions under which soil testing and sampling is useful. (6 marks)