



(Knowledge for Development)

KIBABII UNIVERSITY
UNIVERSITY EXAMINATIONS
2019/2020 ACADEMIC YEAR

SECOND YEAR 2ND SEMESTER
SPECIAL/SUPPLEMENTARY EXAMINATION
FOR THE DEGREE OF BACHELOR OF SCIENCE AGRICULTURE AND
BIOTECHNOLOGY

COURSE CODE: SAB 213
COURSE TITLE: SOIL CHEMISTRY


DATE: 04/02/2021.

TIME: 2-4 PM

INSTRUCTIONS TO CANDIDATES

Answer all Questions in section A and any other two (2) Questions in section B.

TIME: 2 Hours

This paper consists of 2 printed pages. Please Turn Over 

KIBU observes ZERO tolerance to examination cheating

SECTION A = 30ARKS

- 1) a) Define the following terms:
- i) Soil (2 Marks)
 - ii) 2:1:1 clay type (2 Marks)
 - iii) Humus (2 Marks)
 - iv) Cation Exchange Capacity (2 Marks)
 - v) Micelle (2 Marks)
- b) Differentiate between 1:1 and 2:1 clay mineral (2 Marks)
- c) Define sorption isotherm (2 Marks)
- d) Describe the effect of soil organic matter on physical properties of soils. (7 Marks)
- e) Define ion exchange (1 Mark)
- f) What are the advantages and disadvantages of the following liming materials?
- i) CaO (2 Marks)
 - ii) Ca(OH)₂ (2 Marks)
 - iii) CaCO₃ (2 Marks)
 - iv) CaCO₃.MgCO₃ (2 Marks)

SECTION B = 40 MARKS

- 2) a) List two materials used to lower the soil pH (1 Mark)
- b) Describe the procedure for soil pH analysis (Water Method) (6 Marks)
 - c) Explain factors that influence the effectiveness of liming material (8 Marks)
 - d) State various ways of determining Lime requirement of acid soil (5 Marks)
- 3) a) State the formulae of Exchangeable Sodium Percentage (ESP) (3 Marks)
- b) Describe the various types of Soil acidity (6 Marks)
 - c) Describe the conditions under which Saline soils form (6 Marks)
 - d) Explain the sources of soluble salts in Saline soils (5 Marks)
- 4) a) State the significance of C:N ratio (2 Marks)
- b) Differentiate between Saline and Sodic soils (8 Marks)
 - c) Describe the sources of H⁺ ions in the soil (5 Marks)
 - d) With chemical equations, describe chemical weathering reactions in the soil. (5 Marks)