(Knowledge for Development)

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS
2016/2017 ACADEMIC YEAR

SECOND YEAR 2ND SEMESTER
SPECIAL/SUPPLEMENTARY EXAMINATION

FOR THE DEGREE OF BACHELOR OF AGRICULTURE AND
BIOTECHNOLOGY & BACHELOR OF EDUCATION SCIENCE

COURSE CODE: SAB 210
COURSE TITLE: SOIL PHYSICS

DATE: 27TH SEPT. 2017   **TIME:** 8 AM – 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 ▷

QUESTION ONE = 30 MARKS (COMPULSORY)

a) Differentiate between Wet and Dry Bulk Densities   (2 Marks)

b) A soil has an Apparent Density of 1.62 g/cm^3 and a True Density of 2.75 g/cm^3. Calculate

- Total Porosity   (3 Marks)
- Void Ratio   (3 Marks)
- Specific Gravity   (3 Marks)
- Dry Specific Volume   (3 Marks)

c) Classify Soil particles based on ISSS System   (4 Marks)

d) State the Stoke's Law   (2 Marks)

e) Describe the three Models that explain the distribution of ion in the water layer adjacent to the clay minerals   (6 Marks)

f) State the factors that affect Soil Affinity for water   (4 Marks)

QUESTION TWO = 20 MARKS

a) Describe soil structure based on:

- Edaphological approach   (5 Marks)
- Ecological approach   (5 Marks)

b) Describe the complexity of the soil structure   (10 Marks)

QUESTION THREE = 20 MARKS

a) Describe the Swelling process in the soil.   (6 Marks)

b) Calculate the Aggregate Stability of a soil weighing 2.5kg with the sand fraction weighing 400g and the weight retained after sieving is 1.8kg.   (3 Marks)

c) Differentiate between filtering and buffering capacity of soils. (5 Marks)

d) Describe the conditions for Evaporation process of water from the soil to take place.

(6 Marks)

QUESTION FOUR = 20 MARKS

4. a) Describe the crumb formation mechanism according to Calcium linkage theory

(5 Marks)

b) Differentiate between wet and dry sieving as a measure of aggregate stability

(4 Marks)

c) Describe the Atterberg soil constants and limits   (11 Marks)