



(Knowledge for Development)

KIBABII UNIVERSITY
UNIVERSITY EXAMINATIONS
2020/2021 ACADEMIC YEAR

SECOND YEAR 2ND SEMESTER
MAIN EXAMINATION

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

COURSE CODE: ASS 223
COURSE TITLE: SOIL MORPHOLOGY AND CLASSIFICATION

DATE: 7TH OCTOBER 2021

TIME: 9 – 11 AM

INSTRUCTIONS TO CANDIDATES

Answer Question ONE and any other TWO Questions.

TIME: 2 Hours

This paper consists of 4 printed pages. Please Turn Over



KIBU observes ZERO tolerance to examination cheating

1. a) As an invited guest speaker in the 10th Engineers Conference to be held in Maputo, Mozambique, Describe how you would define Soil to the delegates. (2 Marks)
- b) Differentiate between the following terms
- i) Foliated and Non-Foliated Metamorphic rocks (2 Marks)
 - ii) Ab and AB soil horizons (2 Marks)
 - iii) Chromic and Calcaric (2 Marks)
 - iv) Plastic and Friable soil consistency (2 Marks)
- c) As a soil morphology student, describe the soil moisture regimes affecting soil formation. (6 Marks)
- d) A soil is sampled by a core measuring 9.4 cm in diameter and 6.4 cm deep. The core weighs 250 g. The total core plus wet soil weight is 940 g. On oven drying at 105° C the core plus dry soil weighed 720 g. Calculate Wet and Dry bulk densities and Gravimetric moisture contents. (6 Marks)
- e) Describe the main diagnostic features of the following soil types that were observed during the field trip.
- (i) Rhodic Ferralsols in Kakamega – Bungoma counties boundary. (2 Marks)
 - (ii) Humic Vertisols in Mayoni region. (2 Marks)
 - (iii) Humic Nitisols in Malava Forest. (2 Marks)
 - (iv) Xanthic Acrisols in Kakoi region. (2 Marks)

2. a) State with reason, the type of weathering that will take place in the following regions. (2 Marks)

(i) Arid Region

(ii) Humid Region (2 Marks)

b) Describe the Pedogenic processes that takes place in the following regions (8 Marks)

(i) Arid Region

(ii) Humid Regions (8 Marks)

3. As a soil classification expert, describe the USDA soil taxonomy classification system. (20 Marks)

4. With examples, discuss WRB Reference Soil Groups (RSG) soil classification system. (20 Marks)

5. a) Briefly explain Time as a factor of soil formation. (10 Marks)

b) 60.0 g of air-dry soil sample is weighed and after 40 seconds the hydrometer reading corrected for temperature is 32.0 g per litre. After 2 hours, a hydrometer reading after temperature correction is 6.7 g/litre. Calculate percentage sand, silt, and clay and obtain the appropriate textural class of the soil sample using the diagram below. (10 Marks)