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UNIVERSITY EXAMINATIONS 2022/2023 ACADEMIC YEAR

SECOND YEAR 2ND SEMESTER MAIN EXAMINATION

**FOR THE DEGREE OF BACHELOR OF SCIENCE AGRICULTURE
EDUCATION AND EXTENSION, BACHELOR OF SCIENCE
AGRICULTURE AND BIOTECHNOLOGY & BACHELOR OF
EDUCATION SCIENCE**

COURSE CODE: ASS 223

COURSE TITLE: SOIL MORPHOLOGY AND CLASSIFICATION

DATE: 20TH APRIL 2023

TIME: 9 – 11 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



1. a) As an invited guest speaker in the 23rd World Congress of Soil Science to be held Nanjing, China from 2nd to 17th July 2026, describe how you would define Soil to the delegates. (2 Marks)
- b) The Kenya Urban Roads Authority (KURA) is planning to build a new highway and discovers that portions of the new highway will cross soils classified as Gleysols. State how these soils will negatively affect the new highway. (3 Marks)
- c) Differentiate between the following terms
- i) Petrogenesis and Petrography (2 Marks)
 - ii) Bck and BC soil horizons (2 Marks)
 - iii) Ustic and Xeric Soil Moisture Regimes (2 Marks)
 - iv) Lower Plastic Limit and Upper Limit of Viscous Flow (2 Marks)
- d) As a soil morphology student, describe the classification of metamorphic rocks based on their mode of formation. (6 Marks)
- e) A soil core has a volume of 860cm³ and weighing 750gms when dry and 985gms when wet. Calculate the total porosity of this soil. (3 Marks)
- f) Describe the MAIN diagnostic features of the soil types that were observed during the Soil Classification field trip using the WRB 2014 Soil Classification System.(8 Marks)
2. a) Using Equations, differentiate between Carbonation and Oxidation. (4 Marks)
- b) Discuss the role of Topography and Organisms as factors of soil formation. (16 Marks)
3. Discuss the FAO Legend of 1974 as a Soil Classification system. (20 Marks)

4. Describe the USDA Soil Taxonomy of 1961 as a Soil Classification system. (20 Marks)

5. Explain the World Reference Base (WRB) of 1998 as a Soil Classification System.

(20 Marks)