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ASS 101



**MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)
SCHOOL OF AGRICULTURE, VETERINARY SCIENCES AND
TECHNOLOGY (SAVET)**

MAIN CAMPUS

**UNIVERSITY EXAMINATIONS
FIRST YEAR FIRST SEMESTER 2023/2024 ACADEMIC
YEAR**

**MAIN EXAMS
OF
BACHELOR OF AGRICULTURE AND
BIOTECHNOLOGY/AGED/EDUCATION)**

COURSE CODE: ASS 101

COURSE TITLE: INTRODUCTION TO SOIL SCIENCE

DATE: 11.1.23

TIME: 8-10AM

INSTRUCTIONS TO CANDIDATES

This paper is divided into two sections, **A and B**. Answer ALL Questions in SECTION A and any Two in SECTION B

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 4 Printed Pages. Please Turn Over

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SECTION A: ANSWER ALL QUESTIONS (40 MARKS)

Q1. Define the following terms;

i) Micro nutrients (1mk)

ii) Weathering (1mk)

iii) Pedology (1mk)

iv) Edaphologists (1mk)

v) Light intensity (1mk)

Q2. Describe six ways in which living organisms affect soil formation (6mks)

Q3. Describe how intrinsic igneous rocks are formed (4mks)

Q4. Describe four components of the soils found in Kakamega county (4mks)

Q5. Outline five importance of soil in the agricultural sector (5mks)

Q6. Describe four effects of climate change on soil biological properties (4mks)

Q7. Describe two differences between B horizon and C horizon in soil profile (4mks)

Q8. Describe four ways salinity affects soil quality and plant productivity (4mks)

Q9. Outline four sources of soil organic matter in Kenya (4mks)

SECTION B

Q10. i) Discuss three land use practices used to manage and conserve agricultural soils

(9mks)

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ii) The mass of a core ring plus oven dry soil is 200g while the mass of an empty ring is 120g. The inner ring diameter is 3.5 cm and the height is 8 cm. When the ring plus its contents are put in water to saturation, it weighs 240g. Calculate the following keeping the answers for (a) and (b) into 2 decimal places and (c) in to 1 decimal place. (Use $\pi = 22/7$)

- a) Bulk density (2mks)
- b) Particle density (2mks)
- c) Porosity (2mks)

Q11. i) Discuss four factors that influence the levels of soil organic matter(9mks)

ii) Discuss six purpose of soil classification (6mks)

Q12. i) Discuss the effect of four soil chemical properties to crop production

(8mks)

ii) Discuss four functions and three deficiency symptoms of nitrogen in crop production (7mks)

Q9. i) For a 50 g soil sample the first and second hydrometer readings were 30g and 18g respectively. Calculate the following;

- a) % clay (2 marks)
- b) % silt (2 marks)
- c) % sand (2 marks)

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ii) The following chemical properties were found in the A- horizon of Misikhu

Girls National School agricultural field.

Exchangeable cations	M.eq / 100g soil
Ca	1.50
K	0.72
Mg	0.45
Na	0.03
H	0.75
Al	1.90

Using the above information, calculate the following;

- a) CEC (1mk)
- b) % base saturation (1mk)
- c) % exchangeable acidity (1mk)

iii) Discuss three processes involved in chemical weathering that results in soil

formation. (6mks)