



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF AGRICULTURAL AND FOOD SCIENCES

**SECOND YEAR SECOND SEMESTER UNIVERSITY EXAMINATION FOR THE
DEGREE OF BACHELOR OF SCIENCE IN SOIL SCIENCE**

2023/2024 ACADEMIC YEAR

REGULAR

COURSE CODE: ALS 3226

COURSE TITLE: Soil Physical Conditions and Plant Growth

EXAM VENUE:

STREAM: BSc. (Soil Science)

DATE:

EXAM SESSION:

TIME: 2 HOURS

Instructions:

- 1. Answer ALL questions in section A and ANY other 2 Questions in section B.**
- 2. Candidates are advised not to write on question paper.**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room.**

SECTION A [30 MARKS]

Answer ALL questions from this Section.

1. Briefly discuss how soil physical conditions affect the following:
 - a. Nutrient cycling and availability (5 Marks)
 - b. Soil microbial activity (5 Marks)
2. Explain how soil temperature affects the following processes:
 - a. Seed germination (5 Marks)
 - b. Root growth (5 Marks)
3. Explain the effect of the following soil conditions on root growth
 - a. Water stress (5 Marks)
 - b. Waterlogging (5 Marks)

SECTION B [40 MARKS]

Answer ANY TWO questions from this Section.

4. Discuss the effect of soil structure on root development, water movement, and nutrient uptake by plants (20 Marks)
5. Explain the principles of soil-water movement and retention in the soil-plant-atmosphere continuum (20 Marks)
6. Discuss the management of the following soil physical conditions (20 Marks)
 - a. Soil structure
 - b. Soil water
 - a. Soil temperature