



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF AGRICULTURAL AND FOOD SCIENCES

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

2017/2018 ACADEMIC YEAR

REGULAR

COURSE CODE: ALS 3414

COURSE TITLE: RHIZOSPHERE BIOCHEMISTRY

EXAM VENUE: LR 10

STREAM: BSc. (Soil Science)

DATE: 20/12/17

EXAM SESSION: 2.00 – 4.00PM

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]

1. Describe how to determine microbial diversity in the soil. (3 Marks)
2. Identify three beneficial effects of rhizosphere microorganisms in agriculture. (3 marks)
3. Outline three functions root exudates in the rhizosphere (3 Marks)
4. Describe three categories of plant-derived compounds in the rhizosphere (3 Marks)
5. Define and describe two examples of rhizosphere signals (3 marks)
6. Define allelopathy and identify two factors that affect allelopathic effect (3 Marks)
7. Outline three molecular determinants of rhizosphere colonization. (3 Marks)
8. Describe signal transduction in prokaryotes (3 Marks)
9. Identify three Chemical techniques and bioassays that are used to separate, purify and identify rhizosphere signals (3 marks)
10. Identify three enzymes released by plants in root exudates and their function in the rhizosphere (3 Marks)

SECTION B [40 MARKS]

Answer ANY TWO questions from this Section.

1. Discuss the sources of macronutrients in the rhizosphere and the roles they play in promoting rhizosphere communities (20 Marks)
2. Describe the various communications that occur in the rhizosphere (20 Marks)
3. Describe the various rhizosphere communities and discuss their role in bio control, micronutrient acquisition, and bioremediation (20 Marks)
4. Discuss the source, functions and properties of rhizosphere signals that are important for plant-microbial interactions (20 Marks)