JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF AGRICULTURAL AND FOOD SCIENCES

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

2017/2018 ACADEMIC YEAR

REGULAR

COURSE CODE: ALS 3422

COURSE TITLE: SOIL QUALITY ASSESSMENT AND MANAGEMENT

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. Define the following terms:
    a. Soil texture **(2 Marks)**
    b. Soil quality indicators **(2 Marks)**
    c. Soil quality **(2 Marks)**
    d. Soil fertility **(2 Marks)**

2. Explain the role of the following indicators in soil quality assessment
    a. Chemical indicators **(2 Marks)**
    b. Physical indicators **(2 Marks)**
    c. Biological indicators **(2 Marks)**

3. Explain the benefits of soil value to human under the following soil functions
    a. Nutrient cycling **(2Marks)**
    b. Maintaining biodiversity and habitat **(2Marks)**
    c. Water relations **(2Marks)**
    d. Filtering and buffering **(2Marks)**
    e. Physical stability and support **(2Marks)**
4. What are the practices that can cause high bulk density in soil. **(6 Marks)**

SECTION B [40 MARKS]

Answer ANY TWO questions from this Section.

5. You have been approached by the villagers to assist them in assessing the quality of a given soil. Find the conditions of the soil in the table below and give the indicator property you would assess.

Condition	Indicator properties
Weak soil structure	
Crust prone soil	
Low infiltration and high runoff rates	
Low nutrient and water retention	
High erodibility	

Which reference to the indicator properties you have identified, what measures would you put in place to improve on the soil quality, Discuss. **(20 Marks)**

6. Declining crop yields in most of the agroecosystem are related to soil quality. This has led to food insecurity especially in the tropics. Highlight some of the practices that have led to loss of soil quality and discuss the soil quality management practices that can be used to improve the soils. **(20 Marks)**

7. Discuss how agricultural activities may reduce air quality and how to minimize the emissions from reaching the air **(20 Marks)**
    a. Water pollution.
    b. Urban development.
    c. Deforestation and soil degradation.
    d. Population growth.