



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE & TECHNOLOGY**  
**SCHOOL OF AGRICULTURE AND FOOD SCIENCES**  
**UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN**  
**SOIL SCIENCES**  
**3<sup>RD</sup> YEAR 2<sup>ND</sup> SEMESTER 2017/2018 ACADEMIC YEAR**  
**MAIN CAMPUS – REGULAR**

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**COURSE CODE:** ALS 3323  
**COURSE TITLE:** NUTRIENT MANAGEMENT AND RESEARCH IN  
AGROECOSYSTEMS  
**EXAM VENUE:** **STREAM: (BSC. SOIL)**  
**DATE:** **EXAM SESSION:**  
**TIME: 2 HOURS**

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**Instructions:**

- 1. Answer ALL questions in Section A and Any two 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**
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## **SECTION A: SHORT ANSWER QUESTIONS (30 MARKS)**

### **Answer All Questions in this Section**

1. Explain the importance of nutrient management in agro ecosystems. (4 marks)
2. Define the following terms as used in soil nutrient studies: (4 marks)
  - a) Essential nutrients
  - b) Soil fertility
  - c) Primary macronutrient
  - d) Agro ecosystem
3. Differentiate between mobile and immobile nutrients (3 marks)
4. State the methods of fertilizer application. (4 marks)
5. List three differences between organic and inorganic fertilizers. (3 marks)
6. Using an illustration, explain the relationship between plant growth and amount of available nutrient. (2 marks)
7. Citing an example, explain the meaning of fertilizer grade and filler/carrier material. (3 marks)
8. Explain why hydroponic systems are useful when studying plant mineral nutrition. (3 marks)
9. State two differences between quantitative and qualitative techniques of soil analysis. (4 marks).

## **SECTION B: ESSAY QUESTIONS (40 MARKS)**

### **Answer Any Two Questions from this Section**

10. Life in soil changes over short periods, in response to changes in the soil environment. Discuss this statement. (20 marks)
11.
  - a) Describe the components of soil fertility. (8 marks)
  - b) Discuss passive uptake of nutrients in plants. (12 marks)
12. Write an essay on organic farming and soil conservation in agro-ecosystems. (20 marks)
13. Discuss environmental factors that influence nutrient availability and cycling. (20 marks)