



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE & TECHNOLOGY
SCHOOL OF BIOLOGICAL AND PHYSICAL SCIENCES
SPECIAL EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE
MAIN CAMPUS - REGULAR

COURSE CODE: SBT 202
COURSE TITLE: PLANT MINERAL NUTRITION
EXAM VENUE: STREAM (BED)
DATE: **EXAM SESSION:**
TIME: 2 HOURS

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)

1. Distinguish between 2:1 and 1:1 clays and explain how their structures influence mineral availability to plants (3 marks).
2. Describe the 3 ways by which nutrients are supplied to plant roots (3 marks).
3. In most soils, only 0.2% of the available mineral nutrients are dissolved in the soil solution. Provide three reasons why this is ecologically/physiologically important (3 marks).
4. Briefly describe the mechanisms involved in the absorption of nutrient ions adsorbed on the surfaces of clay minerals and humic particles (3 marks).
5. Give two examples of essential minerals and provide two criteria for them to be considered essential (3 marks).
6. Fill in the table provided below (3 marks).

Symptom	Deficient Nutrient element
Stunting, scleromorphism, premature yellowing of leaves	a)
b)	P
Stunted growth, intercostal chlorosis of older leaves	c)

7. Briefly discuss 3 adjustments plant make to improve their efficiency of soil mineral uptake. (3 marks)
8. What are chelating agents, give an example. Briefly explain their role in plant mineral nutrition. (3 marks)
9. Explain 3 practical challenges encountered in using nutrient media/solutions in plant nutrition studies. (3 marks)
10. List two ways of fertilizer classification, providing an example in each case (3 marks).

SECTION B: ESSAY QUESTIONS (40 MARKS)

11. Discuss how the properties of secondary minerals influence availability of dissolved ions in the soil solution. (20 marks).
12. Discuss the mechanisms involved in the mobilization of chemically bound nutrients by plant roots. (20 marks).
13. Discuss environmental challenges associated with over fertilization. (20 marks)
14. Discuss 'Blending' of fertilizers. (20 marks)