

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

**EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN
AGRICULTURE AND BACHELOR OF SCIENCE IN HORTICULTURE**

SOIL 212: SOIL BIOLOGY

STREAMS: BSC AGRIC & HORT

TIME: 2 HOURS

DAY/DATE: MONDAY 08/04/2024

8.30 A.M – 10.30 A.M.

INSTRUCTIONS:

- **Answer ALL questions in SECTION I and ANY TWO in SECTION II**

SECTION 1: ANSWER ALL QUESTIONS

1. (a) Define soil microbiota and explain its role in nutrient cycling. (4 marks)
 - (b) Discuss the importance of soil organic matter in maintaining soil fertility. (3 marks)
2. (a) Compare and contrast the functions of bacteria and fungi in soil ecosystems. (5 marks)
 - (b) Explain the concept of soil pH and its impact on microbial activity. (4 marks)
3. (a) Describe the process of mycorrhizal symbiosis and its significance for plant growth. (4 marks)
 - (b) Define nitrogen fixation and state its importance in soil ecosystems. (3 marks)
4. (a) Examine the factors influencing soil enzymes activity and their role in nutrient cycling. (4 marks)
 - (b) Discuss the concept of soil biodiversity and its relevance to sustainable agriculture. (3 marks)

SECTION 2: ANSWER 2 QUESTIONS

5. (a) Discuss the importance of microbial diversity in soil ecosystems. (5 marks)

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- (b) State and explain factors influencing Microbial Diversity. (7 marks)
- (c) Elaborate on how microbial functions contribute to soil health and fertility. (8 marks)
6. With an aid of a diagram discuss the nitrogen cycle in soil, including the key processes and the role of microorganisms. (20 marks)
7. Evaluate the role of soil biota in promoting sustainable agriculture. Discuss specific interactions between soil organisms and plants and how these interactions contribute to sustainable soil management practices. (20 marks)
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