



**NATIONAL OPEN UNIVERSITY OF NIGERIA
FACULTY OF AGRICULTURAL SCIENCES
DEPARTMENT OF CROP AND SOIL SCIENCE
2025_2 EXAMINATIONS**

COURSE TITLE: SOIL CHEMISTRY, FERTILITY AND MICROBIOLOGY (2CU)

COURSE CODE: SLM 305

TOTAL SCORE: 70 MARKS

INSTRUCTION: Answer 3 questions in all

Question 1 is compulsory (30 marks) and any other TWO questions (20 marks each)

TIME ALLOWED: 2 Hours

- 1ai. Discuss the relationship that soil chemistry has with water chemistry and plants
(6 marks)
- 1aii. Name the key scientific fields that soil chemistry interacts with to form the intricate network of environmental science.
(6 marks)
- 1b. List the three fundamental mechanisms that maintain the concentration of nutrient ions at the root surface and explain them.
(9 marks)
- 1ci. Enumerate the three (3) roles that molybdenum (Mo) plays.
(3 marks)
- 1cii. Describe the three (3) factors that affect molybdenum's availability.
(6 marks)
- 2a. There are fundamental components of soils. Describe the term "soil" in detail, emphasizing its fundamental components.
(6 marks)
- 2b. There are various phases that make up soil. List and briefly describe each of the three phases of soil.
(14 marks)
- 3a. Provide a list of seven (7) ways to maintain the soil organic matter, as it is a major source of nutrients in tropical regions.
(7 marks)
- 3b. Explain why, despite the fact that the atmosphere contains roughly 70% N₂ gas, crop production is most likely to be lacking in this element.
(6 marks)
- 3c. Explain the significance of earthworms for soil fertility.
(7 marks)
- 4a. Name the top four (4) reasons why a soil will be acidic.
(6 marks)
- 4b. Describe the term "Adsorption" in detail.
(11 marks)
- 4c. Give three (3) reasons that affect the availability of copper (Cu), one of the nutrients that is needed in small quantities.
(3 marks)