



**NATIONAL OPEN UNIVERSITY OF NIGERIA
FACULTY OF AGRICULTURAL SCIENCES
DEPARTMENT OF CROP AND SOIL SCIENCE
2024_2 EXAMINATION**

COURSE TITLE: INTRODUCTION TO SOIL CHEMISTRY, FERTILITY AND MICROBIOLOGY

COURSE CODE: SLM305

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

1. a. Explain the influence of plants in soil physicochemical properties (6 marks)
b. i) Discuss the two (2) major factors that affect the availability of Nitrogen as a major nutrient (10 marks)
ii). State three (3) deficiency symptoms of boron and its two (2) functions in plant (5 marks)
c. i) Define the term “Soil Reaction” (5 marks)
ii). State and explain the four ranges in soil pH. (4 marks)
2. a. State four (4) causes of soil acidity (6 marks)
b. Explain in details the term “Adsorption” (11 marks)
c. As one of the nutrients required in small quantity, explain three (3) factors affecting the availability of copper (Cu). (3 marks)
3. a. Discuss the groups of soil microorganisms based on respiration (8 marks)
b. Give 2 of each of the importance of termites with respect to its i) physical effects ii) chemical effects iii) pedological effect (9 marks)
c. Explain the following categories of bacteria based on temperature tolerance: 1) mesophiles ii) Psychrophiles and iii) Thermophiles (3 marks)
4. a. State six (6) importance of fungi as one of the soil microorganisms (9 marks)
b. Discuss the characteristics that soil adsorption exhibits (8 marks)
c. Explain three (3) factors affecting availability of zinc (Zn) (3 marks)