



NATIONAL OPEN UNIVERSITY OF NIGERIA

**Plot 91, Cadastral Zone, Nnamdi Azikiwe Expressway, Jabi - Abuja
Faculty of Science**

DEPARTMENT OF BIOLOGICAL SCIENCES

2024_2 EXAMINATION

COURSE CODE: BIO 408
COURSE TITLE: SOIL ECOLOGY
CREDIT UNIT: 3 Units
TIME ALLOWED: 3 Hours
INSTRUCTION: Answer Question ONE (1) and any other THREE (3) Questions

1.
 - a. List ten (10) chemical elements that predominate the lithosphere. 5 Marks
 - b. Classify soil based on the surface horizons 10 Marks
 - c. If a soil, with organic matter content of 10%, has a bulk density of 1.2 g/cm^3 , and average particle density of 3.333 g/cm^3 ; calculate the percentage porosity of the soil. What is the percentage of solid material of the solid material of the soil? 6 Marks
 - d. State four (4) characteristics of granite rock. 4 Marks
2.
 - a. Define the term weathering 3 Marks
 - b. List the different types of reactions governing biochemical weathering 3 Marks
 - c. Justify the idea behind soil analysis. 4 Marks
 - d. Mention two (2) examples each of the following groups of soil organisms: Microfauna, Vertebrates, Arthropods, microflora, Mesofauna. 5 Marks
3.
 - a. Write notes on bio-integration weathering 4 Marks
 - b. Write a comprehensive note on soil pH. 11 Marks
4.
 - a. With the aid of annotated diagram ONLY, describe the Sulphur cycle. 10 Marks
 - b. Write the molecular formula of each of the following minerals: Goethite, Hematite, Gibbsite, Dolomite, Calcite 5 Marks
5.
 - a. State the properties and distributions of each of the following soil orders: (i) alfisol (ii) andisol soil orders. 8 Marks
 - b. Enumerate the importance of plant analysis in agriculture. 7 Marks
6.
 - a. Vividly, examine how temperature and moisture limit nutrients available to crop plants. 7 Marks
 - b. Enumerate the properties and distribution of vertisols soil. 5 Marks
 - c. Differentiate between sombic and albic horizons 3 Marks