



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
PLOT 91 UNIVERSITY VILLAGE, JABI CADASTRAL ZONE, AIRPORT ROAD, JABI, ABUJA  
**FACULTY OF SCIENCES**  
**OCTOBER 2019\_2 EXAMINATION**

**COURSE TITLE: SOIL ECOLOGY**

COURSE CODE: BIO 408

TIME ALLOWED: 2 HOURS

CREDIT UNIT: 2 CREDIT UNITS

INSTRUCTION: ANSWER **QUESTION 1** AND **ANY OTHER THREE** QUESTIONS

1. (a). Discuss the cation exchange capacity of soil **(13 marks)**  
(b). In the table below, provide the dominant mineral and sedimentary associated with the metamorphic rocks that were specified.

Dominant mineral	Sedimentary rock	Metamorphic rock
Calcite ( $\text{CaCO}_3$ )		
Dolomite ( $\text{CaCO}_3\text{MgCO}_3$ )		
Quartz ( $\text{SiO}_2$ )		
Clays		
		Gneiss
		Schist

**12 marks**

2. (a.) i. What are the **basic types** of biogeochemical cycles? **(2 marks)**  
(a.) ii. State the **characteristics** of biogeochemical cycles. **(4 marks)**  
(b). What are the benefits of soil organisms? **(9 marks)**

3. What are the factors that limit nutrients in the soil? Discuss them. **(15 marks)**
  
4. (a). Briefly Discuss three main sources of soil nutrients. **(11 marks)**  
(b). Compacting a soil would likely reduce the amount of water available to growing plants. Give **four** reasons for this. **(4 marks)**
  
5. (a). With a good schematic diagram, discuss the nitrogen cycle **(12 marks)**  
(b). Why is soil taxonomy said to be a hierarchical classification system? **(3 marks)**