

BOWEN UNIVESRSITY, IWO

COLLEGE OF AGRICULTURE, ENGINEERING AND SCIENCE

B.AGRIC PROGRAM 2022/2023 SECOND SEMESTER EXAMINATION: PRINCIPLES OF SOIL SCIENCE (CRP 212)

Time allowed 3 hours :

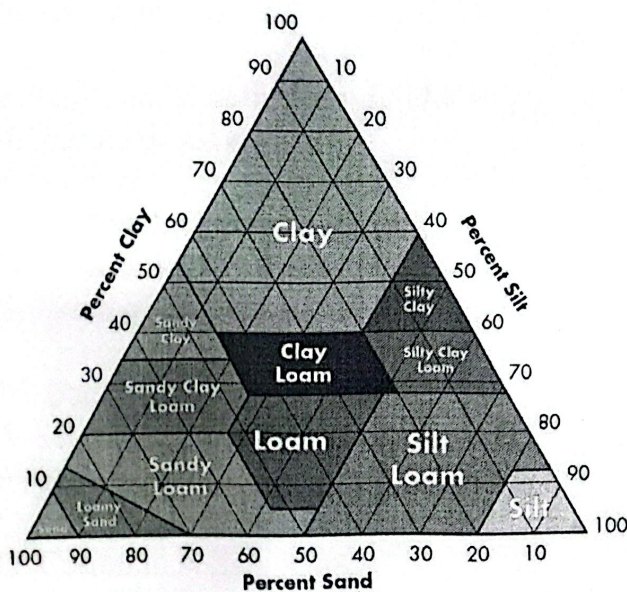
**Part A. Answer all** Questions and Answers : Tick the correct answers.

1. An ideal soil is made up of Mineral matter, organic matter, liquid and air, but what is the percentage?

- A. 45%, 5%, 20% and 30%
- B. 50%, 5%, 12% and 13%
- C. 45%, 5%, 25% and 35 %
- D. 45%, 10%, 20%, and 20%

2. The types of soil structures are listed below except: A. Blocky and granular B. Flat and square C. Prismatic and Single Grained D. Platy and Columnar

3.



3. What soil type is composed of 30% Clay, 60% Sand and 10% Silt?

- A. Clay B. Sandy Clay C. Loamy sand D. Silty clay loam E. None of the above

4. Which of these soil properties determines cation exchange capacity are a. bulk density  
b. soil colour c. soil depth. d. organic matter e. none of these

5. How many essential plant and soil nutrients are there?

- A. 5 B. 25 C. 20 D. 17 E. None of these

6. Which of the following functions is not performed by soil organic matter?

- A. Increases CEC in the soil

- B. Increase the soil bulk density
- C. Supplies N,P and S to plant growth
- D. Holds up to twenty times its weight of water.
- E. None of the above

7. Environmental factors that affects plant growth are

- A. Temperature, moisture supply
- B. Soil aeration, soil structure
- C. Pressure and nutrients
- D. Biotic factors, radiant energy
- E. All of the above

8. Factors affecting root growth are

- A. Mechanical impedance
- B. Soil drainage
- C. Soil temperature
- D. Soil aeration
- E. All of the above

9. Phosphorus deficiency in plants are seen as

- A. purple of leaves
- B. Root rot
- C. Yellow Leaves and curling
- D. Blossom end rot
- E. None of the above

10. Factors that affects soil reaction

- A. seed types
- B. plant height
- C. osmotic pressure
- D. Cation in soils
- E. All of the above

11. How does potassium work to increase crop yields?

- A. Maintains turgor pressure
- B. Increases protein content of plants
- C. Builds cellulose and reduce lodging
- D. Aids in photosynthesis
- E. All of the above

12. Types of potassium found in the soil are: A. Solution K B. Exchangeable K C. Fixed K  
D. Matrix K E. None of the above



**Part B: Instruction: Answer questions one any other three**

1.
  - a. Explain the relevance of soil colloids in soil fertility and plant nutrition
  - b. Describe Importance of Nitrogen and Phosphorus in crop production and mention two sources of fertilizer material for Nitrogen and Phosphorus.
  - c. What is soil reaction?
  - d. Explain the factors that controls soil reactions
  - e. Explain how soil reactions affect availability of macro and micro nutrients in soils with specific examples
2.
  - a. Explain how the factors of soil formation influence the types of soil formed.
  - b. What are some conservation measures that crop producers can take to prevent wind and water erosion?
3.
  - a. Explain effects of soil degradation and how to combat soil degradation in Nigeria
  - b. What do you understand by soil texture?
  - c. Outline the importance of soil texture
  - d. How does texture relate to soil fertility?
4.
  - a. After soil test of a farm land, it was discovered that the soil will need 600kg of N for profitable cassava production, if fertilizer material available contains 15% N, what is the Kg of the material that will be required to meet the plant requirement.
  - b. Describe land capability classification and importance in land use planning
5.
  - a. Explain how to produce a functional soil map to guide a farmer who has 20ha of land for maize and cassava production.
  - b. Compare advantages and disadvantages of organic and inorganic fertilizers
  - c. Calculate amount of Nitrogen, Phosphorus and potassium in 50kg bag of NPK 20-10-10