

# TOPICAL QUESTIONS

## CLASS: FORM FOUR

### TOPIC: SOIL CHEMISTRY

1. Give the meaning of the following terms:
  - i. Soil pH
  - ii. Liming
  - iii. Macronutrient
2.
  - (i) Define soil erosion.
  - (ii) List down four main causes of soil erosion.
3. List down four advantages of organic manure over artificial fertilizers.
4.
  - (i) What is meant by the term "nitrogen fixation"?
  - (ii) State two major processes by which the atmospheric nitrogen is converted to usable form in the soil.
5.
  - (a) What do you understand by each of the following?
    - i. Soil reaction
    - ii. Fertile soil
  - (b) Differentiate active acidity from potential acidity
  - (c) State four (4) factors that affect soil fertility.
  - (d) Name four (4) nitrogenous fertilizers.
6.
  - i. What is manure?
  - ii. Name four (4) types of organic manure.
7.
  - (a) What do you understand by the following terms?
    - i. Soil erosion
    - ii. Leaching
    - iii. Soil fertility
    - iv. Soil pH
  - (b) The weight of fresh soil collected from a farmer's field was 24g. It was oven-dried at 106°C for 22 hours, cooled in a desiccator and weighed. The oven-dry weight was 19.5g. What was the percentage of moisture in the soil sample?
  - (c) Explain why a good farmer is advised to include leguminous plants in crop rotation.

8. a) Group the following plant nutrients into macro-nutrients and micro-nutrients:  
S, Zn, Mo, N, Cl, P, Co, K and Ca.
- b) Give one function of each of the following essential plant nutrients:  
(i) N (ii) P (iii) Zn
- c) A certain soil requires 40kg of nitrogen per litre in order to fulfill the plant requirement of nitrogen. Calculate in kg the quantity of ammonium sulphate  $\{(NH_4)_2 SO_4\}$  fertilizer required to meet the demand.
9. (a) Define the following terms:  
i. Soil  
ii. Soil profile  
iii. Micronutrients
- (b) Explain why a fertile soil is not necessarily productive.
- (c) Soil erosion is one of the problems facing many farming areas in Tanzania leading to poor harvest. As a chemist give four advices to the farmers to overcome soil erosion.
10. a) The weight of a fresh soil sample from a school farm was 55gm. The sample was dried in an oven at  $200^\circ C$ , cooled in desiccators and re-weighed. The weight of the sample, after cooling to constant weight was 46gm. What was the percentage of water in the soil sample?
- b) (i) List at least two chemical substances used to neutralize soil acid.  
(ii) Why do we classify nitrogen as a macronutrient in regard to plants nutrients?
11. (a) (i) What are the natural causes of soil acidity?  
(ii) What cations prevail in acidic soils?
- (b) (i) On treatment with calcium hydroxide the soil pH was raised from E to 7. What can you say about the properties of calcium hydroxide-  
(ii) What effects can the alkalinity of a soil have on the availability of nutrients?  
(iii) Is it sensible to add lime to a field which has received an application of ammonium sulphate fertilizer? Explain.
- (c) With reference to pH, solubility and any other factors, list the main properties of the following fertilizers used in our country:  
i. Ammonium sulphate  
ii. Super phosphate  
iii. Urea
12. Addition of inorganic fertilization in the farm is not as important as addition of organic manure. Discuss the correctness of this statement in four points.