THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL OF TANZANIA

CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

034/2 **AGRICULTURE 2**

Time : 2:15 Hours **ANSWERS** **Year : 2021**

Instructions

1. This paper consists two questions.
2. Answer **all** questions.
3. Communication devices and any unauthorised materials are **not** allowed in the examination room.
4. Write your **Examination Number** on every page of your answer booklet(s).

1. You are provided with the following specimen, apparatus and materials: A, B, C, D, Q, a test tube rack, test tubes, a spatula, a marker pen, masking tape, blue litmus paper, red litmus paper and a stop watch/wall clock. Perform the following procedures and answer the questions that follow.

Procedure:

(i) Observe each of samples A, B, C, and D and record their colour and shape.

(ii) Using a spatula, place a small quantity of each sample in the different test tubes provided and label the test tubes as A, B, C and D as per the sample placed respectively.

(iii) Add Specimen labelled Q in each sample in the test tube and shake the mixtures vigorously.

(iv) Place the strip of red and blue litmus paper in the solution made from dissolved samples made in (iii) simultaneously. Wait for 30 seconds and then observe the pieces of papers.

(v) Record your observations and find out the pH of the samples.

Questions

(a) Tabulate the result of the experiments based on the observation

Sample	Colour	Formulation	Action to litmus paper	pH
A	White crystals	Granules	Turns blue litmus red	Acidic (pH 4–5)
B	Grey powder	Powder	Turns red litmus blue	Basic (pH 9–10)
C	White powder	Crystalline	Turns red litmus blue	Basic (pH 8–9)
D	Brown granules	Granular	No effect on either litmus	Neutral (pH 7)

(b) What will happen if sample A, B and C are repeatedly applied in the same piece of land?

If sample A is applied repeatedly, the soil will become highly acidic, which reduces crop growth. If sample B is applied repeatedly, the soil will become too alkaline, which reduces nutrient availability. If sample C is applied repeatedly, the soil will accumulate salts that interfere with plant root absorption.

(c) Why a farmer frequently applies samples A, B and C in the field?

Farmers apply sample A to reduce soil alkalinity and improve acidic nutrient availability. They apply

sample B to neutralize acidic soils and improve conditions for crops. They apply sample C to supply nutrients like nitrogen, phosphorus, or potassium for crop growth.

(d) Suggest with a reason the best chemical to be applied in a soil having more of sample A and C for optimum growth of plant.
The best chemical to apply is lime, because it neutralizes the excess acidity caused by sample A and balances the soil pH for better crop growth.

(e) Suggest six suitable benefits from pH results that will favour plant growth in the field when applying sample D.
Sample D is neutral, so it maintains soil pH suitable for most crops. It promotes nutrient availability since most nutrients are soluble at neutral pH. It prevents toxic effects of excessive acidity or alkalinity. It ensures healthy microbial activity in the soil. It enhances good root development since roots grow best in neutral soils. It improves fertilizer efficiency since nutrients are not locked by extreme pH.

(f) Give three precautions farmers need to consider when working with chemicals A, B and C in the field environment.
Farmers must wear protective clothing like gloves and masks to prevent chemical burns and poisoning. They should avoid applying excessive amounts to prevent soil degradation. They must store the chemicals safely away from water sources to prevent contamination.

2. (a) You are provided with the following specimens and chemicals: P, U, T, I, Glyphosate and Paraquat. As plant doctors, observe carefully the given specimens and then answer the questions that follow:

(i) Why was it difficult to manage specimen P, U, T and I in the crop field?
It was difficult to manage them because they are weeds that compete with crops for nutrients, water, light and space, and they spread rapidly through seeds and vegetative parts.

(ii) Which herbicide is suitable for eradicating specimen P, U, T and I? Give a reason.
Glyphosate is suitable because it is systemic, meaning it kills both the shoots and the underground roots, ensuring complete eradication of weeds.

(iii) Why the other choice of herbicide is not recommended other than the one you have chosen in (ii)?
Paraquat is not recommended because it only burns the leaves and shoots without killing the underground root system, allowing the weeds to regrow.

(iv) Recommend the most appropriate growth stage of specimens P, U, T and I for maximum effectiveness of the proposed herbicides.
The most appropriate growth stage is the young and actively growing stage, since the weeds absorb and transport the herbicide efficiently through their tissues.

(b) The candidates were provided with the following material, specimen and tool: Z, specimen W, X, spanner number 12 and 13. Carry out the following procedures and then answer the questions that followed.

Experiment 1
Procedures
(i) Use spanner number 12 and 13 to connect one end of each piece of material Z into positive and negative terminals of specimen W.
(ii) Connect the other ends of pieces of material Z into positive and negative terminals of specimen X: Positive to positive and negative to negative terminals.
(iii) Record what have you observed.

Experiment 2
Procedures
(i) Disconnect the two ends of material Z from specimen X.
(ii) Make contact of two ends of disconnected material Z from specimen X.
(iii) Record what you have observed.
(iv) After finishing the experiment, loosen and remove material Z using spanner number 12 and 13 from specimen W.

Questions
(i) What have you observed in both experiments?
In experiment 1, specimen X operated normally after being connected to specimen W, showing flow of current. In experiment 2, sparks were produced when the two ends of material Z were touched together.

(ii) What was the aim of the two experiments?
The aim was to demonstrate how current flows from a power source to an appliance and also to show what happens when live wires are connected directly without a load.

(iii) How will you care and maintain specimen W to make sure that the aim of the two experiments in (ii) are met? Give five points to support your answer.
Keep specimen W charged regularly to maintain its power supply. Clean the terminals to prevent corrosion. Store it in a dry, cool place to avoid damage. Handle it carefully to prevent cracks or leaks. Avoid over-discharging to prolong its life.

(iv) Give the name and function of each specimen W and X.
Specimen W is a battery and its function is to supply electrical energy. Specimen X is a bulb or electrical appliance and its function is to use the electrical energy to produce light or perform work.