THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL OF TANZANIA
CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

033/2A

BIOLOGY 2A
(ACTUAL PRACTICAL A)
(For Both School and Private Candidates)

Time: 2:30 Hours **Year: 2021**

Instructions

1. This paper consists of **two (2)** questions. Answer **all** the questions.
2. Each question carries **twenty five (25)** marks.
3. Except for diagrams which must be drawn in pencil, all writings should be in blue or black ink.
4. Cellular phones and any unauthorised materials are **not** allowed in the examination room.
5. Write your **Examination Number** on every page of your answer booklet(s).

1. You are provided with two Irish potatoes, two water trough, boiling water and two watch glasses with sample **A**. Carry out an experiments as directed in procedures (i) - (ix), then answer the questions that follow.

Procedures

(i) Pill the two irish potatoes provided to remove the outer cover.

(ii) Label one of the irish potatoes as specimens **U** and the other as specimen **V**.

(iii) Put specimen **V** into boiling water for 2 minutes, then take it out and cool.

(iv) Using a knife/scalpel, cut the cross section of the specimen **U** to obtain two halves.

(v) Scoop out the central portion of one half of the specimen **U** to make a hole of about 2.5 cm deep from the cut surface. The walls of the hole must be thin (5-8 mm) thick, but take care not to damage it.

(vi) Place a scooped specimen **U** in the trough.

(vii) Put 3 g of sample **A** in the hole of the specimen **U**.

(viii) Using a pipette or dropper, add 1 drop of water to dissolve the sample **A** in a hole of specimen **U**.

(ix) Put water in the trough until specimen **U** is half immersed. Carefully observe the experiment and note the set up and the level of water at the beginning.

(x) Repeat step (iv) and (ix) for specimen **V** that has been boiled and cooled.

(xi) Leave the experiment for 40 minutes, there after observe the experiment again and note the changes.

Questions

(a) What is the aim of the experiment?

(b) Draw a well labeled diagrams to indicate the setup of the experiment;
   (i) at the beginning
   (ii) after 40 minutes.

(c) Identify two changes observed after 40 minutes of the experiment.

(d) Give a reason for the observed changes in the holes and the troughs after 40 minutes of the experiment.

(e) Identify the specimen which acts as a control experiment.

(f) Give the biological terminologies used to identify the concentration of the solution in each of the following:
   (i) Holes of the specimens
   (ii) Water troughs.

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(g) Based on the observation made from the experiment, why it is not advised to urinate frequently nearby the plants in the dry season?

(h) What are the two benefits the plant gets by undergoing the process you investigated in the experiment?

You have been provided with specimens **D**, **E** and **F**. Study them carefully and then answer the questions that follow.

(a) (i) What is the common name for each of the specimens **D**, **E** and **F**?
(ii) Why is it important to the scientists to classify specimens **D**, **E** and **F** to their lowest taxonomic groups? Give two reasons.

(b) Classify each of the specimens **D**, **E** and **F** to the Phylum/Division level.

(c) Why are specimens **D** and **F** placed to the Phylum/Division you named in (b)? Give two reasons for each specimen.

(d) What do the processing industries benefits from using the plants in which the specimen **E** was taken? Give three benefits.

(e) (i) Draw a well labeled diagram of the specimen **F**.
(ii) State the habitat of the specimen **F**.
(iii) What are the two advantages of the specimen **F** to the farmer?