

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

033/2C

BIOLOGY 2C

(ACTUAL PRACTICAL C)

(For Both School and Private Candidates)

Duration: 2:30 Hours

SOLUTIONS

Year: 2025

Instructions

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

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1. (a) You have been provided with solutions A and B which contain the mixture of different food substances. Carry out an experiment to identify the food substances present in each solution. Your experimental report should be tabulated as shown in Table 1.

Table 1: Identification of Food Substances in Solution A and B

Food tested	Procedure	Observation	Inference
Starch (A)	Add a few drops of iodine solution to solution A	Blue black colour observed	Starch present
Reducing sugar (A)	Add Benedict's solution to solution A and heat	Brick red precipitate formed	Reducing sugar present
Reducing sugar (B)	Add Benedict's solution to solution B and heat	Green to brick red precipitate observed	Reducing sugar present
Protein (B)	Add sodium hydroxide then copper sulfate to solution B	Violet or purple colour observed	Protein present

(b) Specimen C contains protein among others. Prepare the solution from it for Biuret test experiment then state the procedure followed to prepare it.

A small amount of specimen C is crushed thoroughly using a mortar and pestle. Distilled water is added to the crushed specimen and the mixture is stirred well. The mixture is then filtered to obtain a clear solution which is used for the Biuret test.

(c) Carry out the Biuret test to identify food substances present in specimen C. Your experimental report should be tabulated as shown in Table 2.

Table 2: Identification of Biuret Test for Food in Specimen C

Food Tested	Procedure	Observation	Inference
Protein	Add sodium hydroxide to the solution of specimen C, then add copper sulfate dropwise	Violet or purple colour formed	Protein present

(d) State the function(s) of each food substances identified in solutions A B and specimen C to the human body.

Starch supplies energy to the body. It is broken down into glucose which is used during respiration to provide energy for body activities.

Reducing sugars provide quick and readily available energy. They are rapidly absorbed into the bloodstream and used by body cells.

Proteins are used for growth and repair of body tissues. They are also required for the formation of enzymes, hormones, and antibodies.

(e) “Sodium hydroxide” and “dilute hydrochloric acid” were important in some procedure of the experiments. Justify this statement.

Sodium hydroxide is important in the Biuret test because it provides an alkaline medium that allows proteins to react with copper sulfate to form a violet colour. Dilute hydrochloric acid is used to break down complex food substances into simpler forms, making them easier to test and detect during food experiments.

2. You have been provided with specimens W X Y and Z obtained from different habitats. Carefully study them then answer the following questions.

(a) Identify the Kingdom Phylum or Division and Class in which each specimen W X Y and Z belongs.

Specimen W belongs to Kingdom Animalia, Phylum Arthropoda, Class Insecta.

Specimen X belongs to Kingdom Animalia, Phylum Chordata, Class Pisces.

Specimen Y belongs to Kingdom Animalia, Phylum Chordata, Class Amphibia.

Specimen Z belongs to Kingdom Plantae, Division Angiospermophyta, Class Dicotyledonae.

(b) For each specimen W X Y and Z state three visible features which are the characteristics of the respective Class it belongs.

Specimen W has a segmented body divided into head, thorax, and abdomen. It has three pairs of jointed legs and a pair of antennae.

Specimen X has fins for swimming, a streamlined body, and scales covering the body.

Specimen Y has moist smooth skin, strong hind limbs for jumping, and lives both on land and in water.

Specimen Z has broad leaves with reticulate venation, a tap root system, and flowers with parts in multiples of four or five.

(c) Specimens W and X belongs to the same Kingdom and Phylum. Which characteristics they have in common to represent those groups?

Both specimens have an internal body organization and respond to stimuli, showing characteristics of Kingdom Animalia. They also have bilateral symmetry and well developed organ systems.

(d) For each specimen W and Y state two advantages and one disadvantage they have for other living organisms.

Specimen W helps in pollination of flowering plants. It also serves as food for other animals. One disadvantage is that it may act as a pest or disease vector.

Specimen Y helps control insect populations. It also serves as food for higher predators. One disadvantage is that it may transmit parasites or cause imbalance when introduced into new habitats.