

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

033/2B

BIOLOGY 2B

(ACTUAL PRACTICAL B)

(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)

maktaba.tetea.org



1. (a) You have been provided with solutions P and Q each containing a mixture of food substances. Carry out the experiment to identify the food substances present in the solutions provided. Your experimental report should be tabulated as shown in Table 1.

Table 1: Identification of Food Substances in the Solutions P and Q

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

- (b) Specimen N contains lipid among others. Prepare the specimen for the lipid test experiment using a filter paper then outline the procedure used to prepare it.

A small amount of specimen N is crushed to release its contents. The crushed specimen is gently rubbed onto a clean dry filter paper to allow any lipid present to soak into the paper. The filter paper is then left to dry.

(c) Use the filter paper provided to identify the presence of lipid in the specimen N. Present your findings as shown in Table 2.

Table 2: Identification of Lipid in Specimen N

| Food Tested | Procedure | Observation | Inference |
|--------------------|--|----------------------------------|------------------|
| Lipid | Rub specimen N on filter paper and allow it to dry | Translucent greasy spot observed | Lipid present |

(d) State the function(s) of each food substance identified in the solutions and specimen N to the human body.

Starch provides energy to the body. It is broken down into glucose which is used during respiration to supply energy for growth, movement, and body processes.

Reducing sugars supply immediate energy to the body. They are rapidly absorbed into the bloodstream and used by cells for quick energy needs.

Proteins are essential for growth and repair of body tissues. They are also used to make enzymes, hormones, and antibodies.

Lipids act as a concentrated source of energy. They also provide insulation to reduce heat loss and protect vital organs.

(e) Why boiling was important in some procedures of the experiments conducted?

Boiling was important to speed up chemical reactions and allow reagents such as Benedict's solution to react effectively with food substances. It also helps to make some substances more available for testing.

2. You have been provided with specimens I J K and L. Carefully study them and answer the following questions.

(a) State two distinctive features of each specimen I J and K at Class level.

Specimen I has a segmented body and jointed appendages. It also has a hard exoskeleton made of chitin.

Specimen J has feathers covering its body and forelimbs modified into wings.

Specimen K has moist skin and lives both on land and in water.

(b) Specimens I and J belong to the same major group. State two characteristics they have in common.

Both specimens have a backbone, showing they are vertebrates. They also have an internal skeleton which supports the body.

(c) How do the specimens I and L adapted to survive in their natural habitats? Give one point for each.

Specimen I survives by having jointed limbs that allow efficient movement in search of food and shelter.

Specimen L survives by having broad leaves which increase surface area for photosynthesis.

(d) State two ways the farmers benefit from the availability of the specimen L in their farms.

Specimen L improves soil fertility by adding organic matter when its leaves decay.

It also provides shade or acts as a windbreak, protecting crops from harsh environmental conditions.

(e) Outline three advantages and one disadvantage of the specimen I in nature.

Specimen I serves as a source of food for other organisms, helping to maintain food chains.

It helps in pollination or decomposition depending on the species, contributing to ecosystem balance.

Specimen I assists in soil aeration through movement in the soil.

One disadvantage of specimen I is that some species act as pests or disease vectors, causing harm to crops and humans.