

**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)

**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. You have been provided with specimens O and M the chemical reagents and apparatus. You are required to identify the food substances present in the specimens.

(a) Prepare the solutions from specimen O and M for the food test experiments then outline the procedures used to prepare each solution.

#### Preparation of specimen O solution

A small amount of specimen O is crushed using a mortar and pestle. Distilled water is added and the mixture is stirred thoroughly. The mixture is then filtered to obtain a clear solution for food testing.

#### Preparation of specimen M solution

Specimen M is ground into small particles. Distilled water is added and the mixture is shaken well. The mixture is filtered to obtain a clear solution ready for food tests.

(b) Carry out experiments to identify the food substances present in specimens O and M. Your experimental report should be tabulated as shown.

#### Identification of Food Substances in Specimens O and M

<b>Food Tested</b>	<b>Procedure</b>	<b>Observation</b>	<b>Inference</b>
Starch (Specimen O)	Add a few drops of iodine solution to specimen O solution	Blue black colour observed	Starch is present
Reducing sugar (Specimen M)	Add Benedict's solution to specimen M solution and heat	Brick red precipitate formed	Reducing sugar is present
Protein (Specimen M)	Add sodium hydroxide then copper sulfate solution	Violet or purple colour formed	Protein is present

(c) State the function(s) of each food substance identified in 1(b) to the human body.

Starch provides energy to the body. It is broken down into glucose, which is used during respiration to release energy for body activities.

Reducing sugars supply quick energy to the body. They are easily absorbed into the bloodstream and used immediately by cells.

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

(d) Apart from the specimen provided give another one example of natural source from which the food substances identified in 1(b) could be obtained.

Starch can be obtained from natural sources such as maize or cassava.

Reducing sugars can be obtained from fruits such as ripe bananas or sugarcane.

Proteins can be obtained from beans, eggs, or meat.

2. You have been provided with specimens E F and G obtained from different habitat.

Carefully study them and answer the following questions.

(a) Identify the Phylum or Division and the Kingdom in which each specimen E F and G belongs.

Specimen E belongs to Phylum Arthropoda and Kingdom Animalia.

Specimen F belongs to Division Angiospermae and Kingdom Plantae.

Specimen G belongs to Division Fungi and Kingdom Fungi.

(b) For each of specimens E F and G state three observable features which are characteristic of its respective Phylum or Division.

Specimen E has a segmented body, jointed appendages, and a hard exoskeleton made of chitin.

Specimen F has true roots, stems, and leaves. It also produces flowers and seeds enclosed in fruits.

Specimen G lacks chlorophyll, has thread like hyphae, and feeds by saprophytic nutrition.

(c) Name the habitat of each of specimens E F and G.

Specimen E lives in terrestrial habitat.

Specimen F lives in terrestrial habitat.

Specimen G lives in moist or decaying organic matter.

(d) For each of specimens E F and G state whether it is a producer consumer or decomposer in its natural habitat. Give reason for each case.

Specimen E is a consumer because it feeds on other organisms for energy.

Specimen F is a producer because it manufactures its own food through photosynthesis.

Specimen G is a decomposer because it feeds on dead organic matter and breaks it down into simpler substances.

(e) State two advantages and one disadvantage of specimen E to other living organisms.

One advantage of specimen E is that it serves as a source of food to other organisms in the food chain.

Another advantage is that it helps in pollination or soil aeration depending on the species.

One disadvantage is that some arthropods act as pests or disease vectors, causing harm to plants and animals.