

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

033/2C

BIOLOGY 2C

(ACTUAL PRACTICAL C)

(For Both School and Private Candidates)

Time: 2:30 Hours

ANSWERS

Year: 2012

Instructions

1. This paper consists of two questions.
2. Answer all questions.

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1. You have been provided with solution N.

(a) Using the chemicals and reagents provided, carry out food test to identify the food substances present in solution N. Tabulate your work as shown:

Food tested: Starch

Procedure: Add iodine solution to solution N and observe any color change

Observation: A blue-black color appears

Inference: Starch is present

Food tested: Reducing sugar

Procedure: Add Benedict's solution to solution N and heat in a water bath

Observation: Brick-red precipitate forms

Inference: Reducing sugar is present

Food tested: Protein

Procedure: Add Biuret solution to solution N and shake gently

Observation: Purple/violet color appears

Inference: Protein is present

Food tested: Lipid

Procedure: Add ethanol, shake, then add water

Observation: A white emulsion forms

Inference: Lipid is present

(b) For the food substances identified in 1(a):

(i) Name at least two sources for each food substance.

Starch: Cassava, maize

Reducing sugar: Honey, ripe banana

Protein: Eggs, beans

Lipid: Groundnuts, milk

(ii) Name the food substances which play a vital role in children growth.

Proteins and reducing sugars are vital in child growth. Proteins support body tissue development and enzymes while reducing sugars supply energy for growth processes.

(iii) Mention the disease which could develop to a child whose diet misses the food substance named in (b)(ii).

A deficiency in protein may lead to Kwashiorkor, while lack of reducing sugars may result in poor growth and energy deficiency disorders.

(iv) State five symptoms of the condition that will happen to the child in (b)(iii).

- Swollen belly
- Wasting of muscles
- Thinning hair
- Stunted growth
- Skin lesions or discoloration

2. Observe specimens M₁, M₂, M₃ and M₄ then:

(a)(i) Identify specimens M₁, M₂, M₃ and M₄ by their common names.

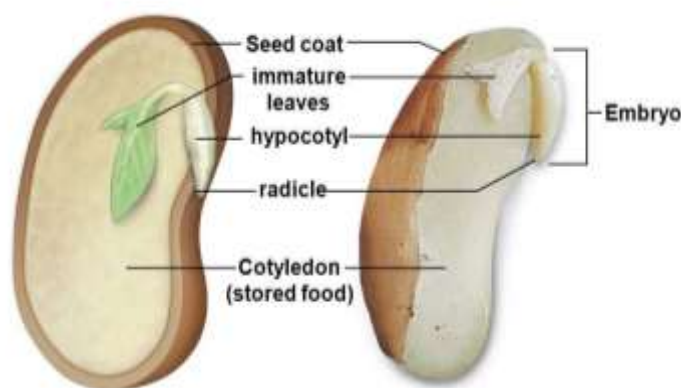
M₁: Bean seed

M₂: Taproot

M₃: Fibrous root

M₄: Fern leaf

(ii) Use the scalpel provided to cut specimen M₁ longitudinally into two equal halves. Then, draw a well labeled diagram of one half of a cut section.



(iii) State one function of each part you have labeled in a diagram above.

Cotyledon: Stores food for germination

Plumule: Develops into the shoot

Radicle: Forms the root system

Micropyle: Entry point for water

Hilum: Scar where seed was attached to the pod

(iv) State two advantages of specimen M₁.

- Source of plant protein when consumed
- Used in crop rotation to improve soil nitrogen through nitrogen fixation

(b) Study specimen M₂ and M₃ carefully, then answer the following questions based on the observable structures:

(i) How do the two specimens differ?

M₂ (taproot) has a single large main root with smaller branches while M₃ (fibrous root) consists of many roots of similar size without a dominant main root.

(ii) How similar are the two specimens?

Both are root systems that anchor the plant and absorb water and mineral salts from the soil.

(c)(i) Name the Class in which specimen M₄ belongs. Give two reasons to support your answer.

Specimen M₄ belongs to Class Pteridophyta.

Reason 1: It reproduces by spores instead of seeds.

Reason 2: It has compound leaves with a central stalk and leaflets and shows vascular tissue for transport.

(ii) State one disadvantage of specimen M₄.

Ferns can overgrow and dominate other plant species, reducing biodiversity.