

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

033/2A

BIOLOGY 2A

(ACTUAL PRACTICAL A)

(For Both School and Private Candidates)

Time: 2:30 Hours

ANSWERS

Year: 1990

Instructions

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

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1. You have been provided with specimen A. Design and carry out an experiment to identify the food substance(s) present in it.

Test for	Procedure	Observation	Inference
Starch	Add iodine solution to specimen A	Blue-black coloration	Starch is present
Reducing sugar	Add Benedict's solution, heat in water bath	Brick-red precipitate forms	Reducing sugar present
Protein	Add Biuret solution and shake	Violet color appears	Protein is present
Lipid	Mix with ethanol, shake, add water	Milky-white emulsion forms	Lipid is present

2. Study specimens M and N carefully.

(a)(i) Identify specimens M and N by giving their common names.

M: Cassava

N: Carrot

(ii) What parts of the plant do specimens M and N represent? Give reasons.

M is a root tuber and N is a taproot. Both are modified roots that store food, which gives them a swollen appearance.

(iii) Draw and label specimen M.

(Diagram should include: skin, cortex, xylem, phloem, storage tissues)

(b)(i) State one function common to both specimens M and N in nature other than storage of food.

Anchoring the plant in the soil

(ii) Suggest one food substance stored in specimen M.

Starch

(c) Perform a food test to verify your answer in (b)(ii).

Test for	Procedure	Observation	Inference
Starch	Add iodine to cassava extract	Blue-black color forms	Starch is present

3. Study specimens O, P, Q, R, S, and T carefully.

(a) What name is given to the group of plant parts to which specimens O, P, Q, and R belong?

Fruits. They are mature ovaries formed after fertilization, each containing seeds and protective tissue.

(b) Giving reasons, show which of O, P, Q, R is a:

(i) Caryopsis – O (maize): seed coat fused with fruit wall

- (ii) Drupe – P (mango): fleshy fruit with a hard stone-like seed
- (iii) Berry – Q (tomato): fleshy throughout, multiple seeds
- (iv) Pod – R (bean): dry fruit that splits along two seams

(c)(i) Identify specimens S and T.

S: Tadpole

T: Frog

(ii) What is the name of the process by which specimen S changes to T?

Metamorphosis

(iii) From which class of animals were specimens S and T taken?

Class Amphibia

4. (a) Which distinguishing characteristics observable in specimens H and I are used to place them in their respective phyla?

Specimen H (millipede): Segmented body, paired legs per segment – Phylum Arthropoda

Specimen I (earthworm): Segmented body with setae, no jointed limbs – Phylum Annelida

(b) Name the phyla and classes to which specimens H and I belong.

H: Phylum Arthropoda, Class Diplopoda

I: Phylum Annelida, Class Oligochaeta

(c) Draw and label specimens H and I.

