

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

033/2B

BIOLOGY 2B

(ACTUAL PRACTICAL B)

(For Both School and Private Candidates)

Time: 2:30 Hours

ANSWERS

Year: 2006

Instructions

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

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1. You have been provided with paste P₁. The paste was obtained by grinding solid food sample in a mortar and little amount of water was added to it.

(a) Design and carry out experiments to identify the carbohydrates present in P₁.

Record your experimental work as shown in Table 1 below:

Test for	Procedure	Observations	Inferences
Starch	Add iodine solution to paste P ₁	Blue-black coloration	Starch is present
Reducing sugar	Add Benedict's solution and heat the mixture in a water bath	Brick-red precipitate forms	Reducing sugar present
Non-reducing sugar	Boil with dilute HCl, neutralize with NaOH, then do Benedict's test	Brick-red precipitate appears	Non-reducing sugar present

(b)(i) Name four (4) natural sources of the food substances identified in (a) above.

Starch: Maize, cassava

Reducing sugar: Ripe banana, honey

Non-reducing sugar: Sucrose from sugarcane, pineapple

(ii) Name the enzymes and the parts of the digestive system in man which are responsible for digestion of each food substance identified in (a) above before they get into the blood.

- Starch:

Enzyme – Salivary amylase (mouth), Pancreatic amylase (small intestine)

Products – Maltose then glucose

- Reducing sugar:

Already in simple form, absorbed in the small intestine

- Non-reducing sugar (Sucrose):

Enzyme – Sucrase (in the small intestine)

Product – Glucose and fructose

2. Observe specimen H carefully.

(a) Design and carry out an experiment to show that chlorophyll is necessary for photosynthesis.

Use a variegated leaf. Boil the leaf to kill it, decolorize with ethanol, rinse in warm water, then test with iodine solution. Blue-black color appears only in green areas.

(b) Write down the importance of photosynthesis.

- Produces glucose as food for the plant

- Releases oxygen into the atmosphere

- Converts solar energy into chemical energy
- Forms the base of food chains

(c) Draw specimen H before and after the experiment.

(Diagram before: green and white leaf

Diagram after: blue-black in green areas, no change in white areas)

3. You have been provided with specimens D, E, F and G.

(a)(i) Give a common name for each of the specimens D, E, F and G.

D: Grasshopper

E: Butterfly

F: Spider

G: Lizard

(ii) Mention the habitats of specimens E, F and G.

E (Butterfly): Flower gardens, forests

F (Spider): Dark corners, under stones

G (Lizard): Rocky areas, warm dry places

(iii) How is specimen G adapted to its environment?

G has dry scaly skin to reduce water loss, claws for gripping, strong legs for movement on rocky surfaces, and camouflage to avoid predators.

(b)(i) To which kingdom does each of specimens D, E, F and G belong?

All belong to Kingdom Animalia.

(ii) Using observable features explain how specimen D differs from other specimens.

Specimen D has strong hind legs for jumping, three body parts (head, thorax, abdomen), and three pairs of legs, classifying it as an insect. The others either have two body parts or four limbs (G is a vertebrate).

(iii) Draw a diagram to show the feeding relationship between D, E, F and G. Giving reasons name this type of feeding relationship.

Grasshopper (D) → Butterfly (E) → Spider (F) → Lizard (G)

This is a food chain representing a predator-prey feeding relationship.

(c) Using examples give the economic importance of specimen F.

Spiders feed on insects and help control pests in farms and gardens. They also produce silk used in research and materials development.