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: 1989**

Instructions

1. This paper consists of two questions.

2. Answer all questions.

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1. You have been provided with specimen E.

(a) Outline the procedure you would follow to prepare specimen E for the investigation.
- Wash specimen E thoroughly
- Peel if necessary and cut into small pieces
- Grind using a mortar and pestle
- Add a small amount of distilled water and mix into a paste
- Filter to obtain the extract for testing

(b) Record your procedure, observations, and inferences in the table:

Test for	Procedure	Observation	Inference
Starch	Add iodine solution to specimen E extract	Blue-black color appears	Starch is present
Reducing sugar	Add Benedict's solution and heat in water bath	Brick-red precipitate forms	Reducing sugar present
Non-reducing sugar	Add dilute HCl, boil, neutralize with NaOH, add Benedict's, heat again	Brick-red precipitate forms	Non-reducing sugar present

2.
(a)(i) Hold one part with the cut surface facing upwards. Draw and label fully.
(Diagram should include: epidermis, cortex, vascular bundle, pith, and storage tissues)

(ii) What functions does specimen E perform in the plant? Give reasons for your answer.
It stores food (mainly carbohydrates) for future use. It also helps in vegetative propagation. This is supported by its fleshy internal structure and presence of stored starch.

(b) Specimens F and G are parts of the epidermis of a leaf mounted in distilled water and concentrated sugar solution.

(i) Identify which specimen is mounted in distilled water.
The specimen showing turgid, swollen cells with large vacuoles is in distilled water because water entered the cells via osmosis.

(ii) Identify which specimen is mounted in concentrated sugar solution.
The specimen showing plasmolysis (shrunken cytoplasm and pulled membrane) is in sugar solution because water left the cells via osmosis.

3. Study specimens H and I carefully.

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

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H: Has moist skin, webbed feet, external fertilization – Class Amphibia
I: Has feathers, beak, wings, and lays eggs with hard shells – Class Aves

(b) Name the phyla and classes to which specimens H and I belong.
Both belong to Phylum Chordata
H: Class Amphibia
I: Class Aves

(c) (i) Clearly state how the hind limb is adapted for the functions it performs in specimen H.
- Long and muscular for jumping
- Webbed feet for swimming
- Jointed bones for flexibility and strong propulsion
- Toes help in movement and grip on land and water

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