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: 2002**

Instructions

1. This paper consists of two questions.

2. Answer all questions.

1. You are provided with 2 plant organs: O_1 and O_2.

Test for	Procedure	Observation	Inference
Starch	Add iodine solution to extract from O_1 and O_2	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
Protein	Add Biuret solution and shake	Purple color appears	Protein is present

(a) Name organs O_1 and O_2
O_1: Leaf
O_2: Seed

(b) State the functions of O_1 and O_2 in the life of the plant.
O_1 (leaf): Site of photosynthesis to produce food for the plant. Leaves also help in transpiration and gas exchange.
O_2 (seed): Stores food for embryo and helps in reproduction by giving rise to a new plant.

(c) List down two ways in which specimen O_2 is important to man.
- Acts as a source of food (e.g., beans, maize)
- Source of oil and protein in diet

(d) Describe the path taken by a food molecule present in O_1, from the time it is absorbed until it reaches the right atrium (auricle).
- Glucose from O_1 is digested into simpler sugars
- Absorbed in the small intestine into the blood via villi
- Carried through hepatic portal vein to the liver
- From liver to the heart via hepatic vein to the inferior vena cava
- Then enters right atrium of the heart

2. You are provided with solution W, substance X, beaker, and filter paper.

(a) Identity substance X and solution W giving reasons.
X: A colored dye or pigment
W: Water
Because pigment diffuses outward in water on filter paper, showing movement due to diffusion

(b) Explain why the change was observed.
The dye particles move from a region of higher concentration (center) to a region of lower concentration (surrounding paper), due to diffusion.

(c)(i) Draw a conclusion from the experiment.
Particles move freely in liquids and spread out from high to low concentration.

(ii) State the importance of the phenomenon in nature.
Diffusion allows exchange of gases in respiration and photosynthesis, movement of nutrients and waste in cells.

3. (a)(i) Identify specimens T_1 and T_2.
T_1: Fern
T_2: Moss

(ii) Classify T_1 and T_2 into their respective kingdoms.
Both belong to Kingdom Plantae
T_1: Division Pteridophyta
T_2: Division Bryophyta

(iii) List down the common habitat for T_1 and T_2.
Moist, shady environments such as forest floors and rocks near streams

(iv) State the mode of nutrition in T_1 and T_2.
Autotrophic (photosynthesis)

(v) Write down the economic importance of T_1 and T_2.
T_1: Ornamental plants, soil improvement
T_2: Used in decoration, retain moisture in soil

(b)(i) Identify specimens Z and Y using their common names.
Z: Tendril
Y: Root tip

(ii) State the main function of specimens Z and Y in a plant's life.
Z: Provides support by climbing
Y: Root tip helps in elongation and absorption of water/minerals

(iii) Specimen Z is used by plants to respond to stimulus. State the stimulus and the type of response.
Stimulus: Touch
Type of response: Thigmotropism (growth response to touch)