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: 2014**

Instructions

1. This paper consists of two questions.

2. Answer all questions.

1. You have been provided with solution N.

(a) Carry out food test experiments to identify the food substance(s) present in solution N. Record your experimental work as shown in Table 1.

Table 1
Food tested: Protein
Procedure: Add sodium hydroxide and copper(II) sulfate (Biuret test)
Observation: Solution turns purple
Inference: Protein is present

Food tested: Reducing sugar
Procedure: Add Benedict's solution and heat
Observation: Turns brick-red
Inference: Reducing sugar is present

Food tested: Starch
Procedure: Add iodine solution
Observation: Turns blue-black
Inference: Starch is present

(b) State the role(s) of the food substances identified in 1(a) above to a person who has just recovered from malaria.
- Protein: Repairs damaged tissues and builds new cells
- Reducing sugar: Provides quick energy for recovery
- Starch: Serves as a long-term energy reserve to regain strength

(c) Which enzymes in the small intestine are involved in the digestion of the food substance(s) identified in 1(a)?
- Protein: Trypsin, Peptidase
- Reducing sugar: Maltase, Sucrase, Lactase
- Starch: Pancreatic amylase

(d) State four adaptive features which enable the ileum to absorb digested food efficiently.
- Long length increases surface area for absorption
- Presence of villi and microvilli to further enlarge surface area
- Rich blood supply to transport absorbed nutrients
- Thin epithelium for faster diffusion

2. Study specimens E_1, E_2 and E_3 then answer the following questions.

(a) Name the Kingdom of each specimen E_1, E_2 and E_3.
- E_1: Plantae

- E_2: Animalia
- E_3: Fungi

(b) State three characteristics of each kingdom you named in 2(a).

Plantae:
- Have chlorophyll and perform photosynthesis
- Cell walls made of cellulose
- Stationary with fixed root systems

Animalia:
- Multicellular and lack cell walls
- Move actively in their environment
- Heterotrophic by ingestion

Fungi:
- Lack chlorophyll
- Cell walls made of chitin
- Absorb nutrients from decomposing matter

(c) State the differences between specimens E_1 and E_3 with respect to:

(i) Habitat
- E_1: Found in open, well-lit environments (e.g., gardens, forests)
- E_3: Found in damp, dark, decaying matter (e.g., logs, soil)

(ii) Mode of nutrition
- E_1: Autotrophic (photosynthesis)
- E_3: Saprophytic (absorbs nutrients from dead matter)

(d) State two advantages and one disadvantage for each of specimen E_1, E_2 and E_3.

E_1 (Plant):
Advantages: Provides oxygen, used as food
Disadvantage: May compete with crops if it's a weed

E_2 (Animal):
Advantages: Source of food, helps in pollination
Disadvantage: Can be a pest or spread disease

E_3 (Fungi):
Advantages: Decomposes organic matter, used in food (mushrooms)
Disadvantage: Some species are poisonous or cause infections