THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL

CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

033/2B **BIOLOGY 2B**

(ACTUAL PRACTICAL A)

(For Both School and Private Candidates)

Time: 2:30 Hours **ANSWERS** **Year: 2018**

Instructions

1. This paper consists of two questions.

2. Answer all questions.

1. You have been provided with solution A.

(a) Identify the food substances present in solution A by using the chemicals and reagents provided. Tabulate your work as shown in Table 1:

Table 1

Food tested: Starch
Procedure: Add iodine solution to solution A
Observation: Blue-black color appears
Inference: Starch is present

Food tested: Reducing sugar
Procedure: Add Benedict's solution and warm
Observation: Color changes from blue to red or brick-red
Inference: Reducing sugar is present

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

Food tested: Lipid
Procedure: Add Sudan III solution and shake
Observation: Red-stained oil layer forms
Inference: Lipid is present

(b) For each food substance identified in 1(a), name three common sources.
- Starch: maize, rice, cassava
- Reducing sugar: honey, fruits, milk
- Protein: eggs, meat, beans
- Lipid: butter, groundnut, palm oil

(c) State the role of each food substance identified in 1(a).
- Starch: provides long-term energy
- Reducing sugar: provides quick energy
- Protein: helps in growth and repair of body tissues
- Lipid: stores energy and insulates the body

(d)(i) The digestion of one of the identified food substances in (a) starts in the mouth. Name this food substance and the enzyme responsible for its digestion.
Food substance: Starch
Enzyme: Salivary amylase

(ii) Name the part of the digestive system in which most of digestion and absorption take place.
Small intestine

(iii) Name two enzymes found in the part you named in (ii) that are responsible for digestion of the food substance identified in (a).
- Maltase
- Lactase

(iv) Explain how the named part in (d)(ii) is adapted for absorption of digested food substances.
- Long and coiled to increase surface area
- Lined with villi and microvilli for efficient absorption
- Has a rich supply of blood vessels for transport of absorbed nutrients

(v) Mention the medium favourable for enzymes found in the part you named in (d)(ii) to work properly.
Alkaline medium (provided by bile from the liver)

2. You have been provided with specimens L_1, L_2, L_3 and L_4.

(a) Use the hand lens to observe these specimens then:

(i) Identify each of the specimens L_1, L_2, L_3 and L_4 by their common names.
- Specimen L_1: Earthworm
- Specimen L_2: Cockroach
- Specimen L_3: Termite
- Specimen L_4: Millipede

(ii) Classify specimens L_1, L_2 and L_3 to the Class level:

Specimen L_1:
- Kingdom: Animalia
- Phylum: Annelida
- Class: Oligochaeta

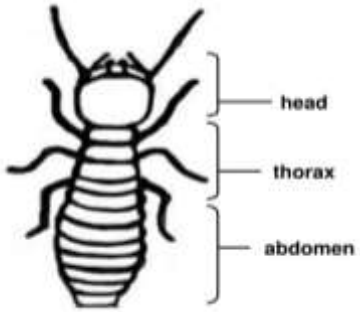
Specimen L_2:
- Kingdom: Animalia
- Phylum: Arthropoda
- Class: Insecta

Specimen L_3:
- Kingdom: Animalia
- Phylum: Arthropoda

- Class: Insecta

(b) Study specimen L_3 carefully then answer the following questions:

(i) Draw a diagram of specimen L_3 and label three parts.



(ii) Identify the habitat of specimen L_3.
It lives in moist soil or wood tunnels, commonly found in rotting wood or underground nests.

(iii) In what ways is the specimen L_3 important in nature?
- Aids in the decomposition of dead wood and organic matter
- Improves soil fertility through its droppings
- Serves as food for birds and other insectivores

(c) State two advantages of the specimen L_1.
- Aerates and loosens the soil through burrowing
- Adds nutrients to the soil through decomposition and casting

(d) State four advantages of the specimen L_4.
- Helps in breaking down decaying organic material
- Improves soil structure and drainage
- Enhances nutrient recycling in the ecosystem
- Serves as food for birds, amphibians, and reptiles