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: 2017**

Instructions

1. This paper consists of two questions.

2. Answer all questions.

1. You have been provided with solution X.

(a) Perform experiments using the reagents provided to identify the type of food substance(s) present in the solution X. Tabulate your results as shown in Table 1:

Table 1

Food tested: Starch
Procedure: Add iodine solution to solution X
Observations: Solution turns blue-black
Inference: Starch is present

Food tested: Reducing sugar
Procedure: Add Benedict's solution and warm
Observations: Solution turns brick-red
Inference: Reducing sugar is present

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

(b)(i) Name two sources of food from which each of the food substances identified in 1(a) could have been extracted.
- Starch: maize, yam
- Reducing sugar: honey, fruits
- Protein: beans, milk

(ii) Give the name of the end product after digestion for each food substance identified in 1(a).
- Starch: glucose
- Reducing sugar: glucose
- Protein: amino acids

(c) Explain the role(s) of each food identified in 1(a).
- Starch: provides long-term energy after breakdown to glucose
- Reducing sugar: supplies quick energy
- Protein: supports tissue growth, repair, enzyme and hormone production

(d) Why is it important to use dilute hydrochloric acid in this experiment?
To simulate the acidic environment of the stomach which aids in digestion and enzyme activity during protein tests.

2. Study specimens K_1, K_2, K_3 and K_4.

(a)(i) Identify specimens K_1, K_2, K_3 and K_4 using their common names.
- K_1: Earthworm
- K_2: Grasshopper
- K_3: Leaf
- K_4: Housefly

(ii) State the Phylum/Division of each specimen K_1, K_2, K_3 and K_4.

K_1:
- Kingdom: Animalia
- Phylum: Annelida

K_2:
- Kingdom: Animalia
- Phylum: Arthropoda

K_3:
- Kingdom: Plantae
- Division: Angiospermophyta

K_4:
- Kingdom: Animalia
- Phylum: Arthropoda

(b)(i) Name the Class(es) to which specimens K_2 and K_4 respectively belong.

K_2:
- Class: Insecta

K_4:
- Class: Insecta

(ii) Give three distinctive characteristics which convinced you to agree with other scientists that specimens K_2 and K_4 must be placed in the Class(es) you named in (b)(i) and not otherwise.
- Possess three body segments: head, thorax, and abdomen
- Have three pairs of jointed legs
- Possess compound eyes and one or two pairs of wings

(c)(i) State one advantage and one disadvantage of specimen K_1.
Advantage: Helps in soil aeration and decomposition
Disadvantage: May damage crops through burrowing activity

(ii) Explain three functions of specimen K_3 to plants.
- Carries out photosynthesis
- Provides surface for transpiration
- Stores food and helps in gaseous exchange

(d) Identify three observable structures which are typical characteristics of Kingdom Animalia in both specimens K_1 and K_2.
- Presence of bilateral symmetry
- Multicellular with specialized tissues
- Ability to move (locomotion)