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: 2018**

Instructions

1. This paper consists of two questions.

2. Answer all questions.

1. You are provided with specimen X.

(a) Write the procedure you will follow to prepare a solution of specimen X for investigation.
- Peel specimen X to remove the outer cover.
- Cut it into small pieces and grind using a mortar and pestle to form a paste.
- Add a small amount of distilled water and mix thoroughly.
- Filter the mixture using a sieve or muslin cloth to obtain a clear solution.

(b) Using the chemical reagents provided, carry out experiments to identify the food substance(s) present in specimen X. Record your experimental work as shown in Table 1.

Table 1

Food tested: Starch
Procedure: Add 2 drops of iodine solution to the sample
Observation: Solution turns blue-black
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 then copper(II) sulfate solution (Biuret test)
Observation: Solution turns purple
Inference: Protein is present

Food tested: Lipid
Procedure: Add Sudan III solution and shake
Observation: A red-stained oil layer appears
Inference: Lipid is present

(c) State two properties of the food substance(s) identified in specimen X.
- Insoluble in water but becomes detectable in solution
- Undergoes specific color change when tested with corresponding reagent

(d) Name four other sources which contain the same food substances as that identified in specimen X.
- Maize
- Rice
- Yam
- Cassava

(e) Mention the parts of the human alimentary canal in which the digestion of the food substance in specimen X take place.
- Mouth
- Small intestine (duodenum and ileum)

(f) Explain how the body store excess food substance(s) identified in solution X.
- Excess starch and sugar are converted into glycogen and stored in the liver and muscles
- Excess carbohydrates can also be converted into fat and stored in adipose tissues

(g) Why the food substance(s) identified in solution X important in the human body?
- Provides energy required for daily metabolic processes
- Supports physical activities and body functions like breathing, circulation, and movement

2. You have been provided with specimens C, D and F.

(a)(i) Identify specimens C, D and F by their common names.
- Specimen C: Grasshopper
- Specimen D: Earthworm
- Specimen F: Housefly

(ii) To which Kingdom(s) do specimens C, D and F belong?
- Specimen C: Kingdom Animalia
- Specimen D: Kingdom Animalia
- Specimen F: Kingdom Animalia

(b)(i) Name the habitats of specimens C, D and F.
- Specimen C: Grasslands and vegetation
- Specimen D: Moist soil
- Specimen F: Human settlements and garbage areas

(ii) How specimen D is adapted to its habitat?
- Slimy, moist skin for respiration
- Segmented body for movement in soil
- Bristles (setae) for anchoring in the soil during burrowing

(iii) Name the Classes in which scientists place specimens C and F.
- Specimen C: Class Insecta
- Specimen F: Class Insecta

(iv) State three distinctive characteristics that made you to agree with other scientists that specimens C and F must dwell in the Class you named in (b)(iii) and not otherwise.
- Body divided into three parts: head, thorax, and abdomen
- Possession of three pairs of legs

- One or two pairs of wings and compound eyes

(c)(i) In which ways are specimens C and F of advantage to man?
- They aid in pollination which supports crop production
- Serve as food sources for birds and other organisms in the food chain
- Used in biological research and education

(ii) Draw a diagram of specimen F and label the parts which are involved in sensitivity and locomotion.