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: 2016**

Instructions

1. This paper consists of two questions.

2. Answer all questions.

1. You have been provided with solution K.

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

Table 1

Food tested: Starch
Procedure: Add iodine solution to solution K
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 then copper(II) sulfate (Biuret test)
Observations: Solution turns purple
Inference: Protein is present

(b) For the food substance(s) identified in 1(a):

(i) Name the end product of digestion in the alimentary canal of human being.
- Starch: Glucose
- Reducing sugar: Glucose
- Protein: Amino acids

(ii) Explain one function of each food substance in the body of the human being.
- Starch: Provides energy after being converted to glucose
- Reducing sugar: Offers quick energy source
- Protein: Builds body tissues, enzymes, and hormones

(iii) Mention which food substance identified in 1(a), its digestion starts at the mouth?
Starch

(c) Name other type(s) of food which should be added to the food substances identified in 1(a) to make a balanced diet.
- Lipids (e.g., oil, butter)
- Vitamins and minerals (e.g., fruits, vegetables)
- Water

2. You have been provided with specimens W, X, Y and Z.

(a) Study specimens W, X, Y and Z carefully, then:

(i) Identify specimens W, X, Y and Z using their common names.
- W: Butterfly
- X: Grasshopper
- Y: Spider
- Z: Earthworm

(ii) State two observable similarities and differences between specimen W and X.
Similarities:
- Both have jointed legs
- Both have segmented bodies

Differences:
- W has wings while X may not
- W undergoes complete metamorphosis, X undergoes incomplete metamorphosis

(iii) Classify specimen X and Z to Class level:

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

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

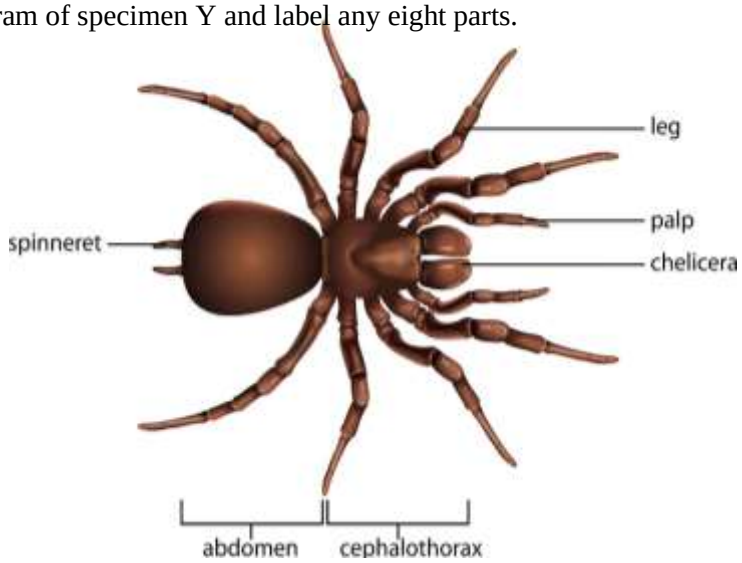
(iv) Give two examples of organisms that belong to the same Class as specimen X.
- Mosquito
- Housefly

(v) State two advantages of specimen W.
- Aids in pollination
- Contributes to biodiversity and aesthetic value

(b) Observe the structure of specimen Y.

(i) Name a Class in which the specimen Y belongs.
Class: Arachnida

(ii) Draw a diagram of specimen Y and label any eight parts.



(iii) Outline three distinctive characteristics of the Class in which specimen Y belongs.
- Has two body parts: cephalothorax and abdomen
- Possesses four pairs of legs
- Lacks antennae and wings

(c) Explain three ways in which specimen Z contributes to soil improvement.
- Burrowing improves soil aeration and drainage
- Ingested organic matter is broken down and released as nutrient-rich castings
- Enhances soil fertility by decomposing plant material