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: 2020**

Instructions

1. This paper consists of two questions.

2. Answer all questions.

1. You are provided with a tooth pick, piece of cotton wool, methylated spirit and samples labeled A and B which are stimuli of receptors in your body. Carry out the experiments in item (i) – (iv) and then answer the questions that follow:

(a)(i) Give the name of the sense organ that covers your hands.
The skin.

(ii) Explain four functions of the sense organ mentioned in (a)(i).
- Detects changes in temperature, pressure, pain, and touch
- Protects internal organs from mechanical injury and infection
- Regulates body temperature through sweating and vasodilation
- Assists in excretion of waste products through sweat glands

(b)(i) What did you feel when you pricked the upper part of your hand with a tooth pick?
A sharp pain.

(ii) What type of sensory receptor responsible for the feeling in (b)(i)?
Pain receptors (nociceptors).

(c)(i) Identify the coarseness felt in each of the samples A and B.
- Sample A: Rough
- Sample B: Smooth or less rough

(ii) What type of sensory receptor responsible for the feeling in (c)(i)?
Touch receptors (mechanoreceptors).

(d)(i) What did you feel when you rubbed methylated spirit on your skin?
A cold sensation followed by a feeling of dryness.

(ii) Give the two types of sensory receptors responsible for the feeling in (d)(i).
- Thermoreceptors (for detecting temperature change)
- Mechanoreceptors (for detecting the rubbing/touch)

(e) What was the aim of the experiment?
To investigate the sensitivity of the skin to different stimuli and identify sensory receptors involved.

(f) Explain the roles of hairs and sweat pores on the sense organ covering your hands.
- Hairs detect slight touch or movement in the environment.
- Sweat pores help in temperature regulation and excretion of waste.

2. You have been provided with specimens P, Q and R. Examine them carefully, then answer the questions that follow:

2.(a)(i) Classify the specimens P, Q and R to Phylum/Division level:

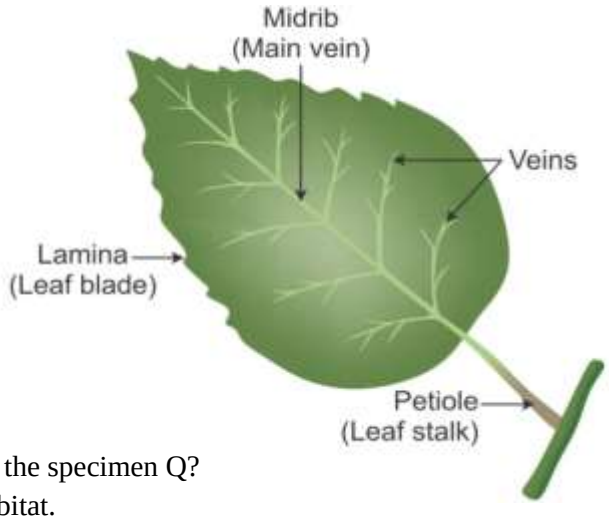
Specimen P:
- Kingdom: Plantae
- Division: Angiospermophyta

Specimen Q:
- Kingdom: Animalia
- Phylum: Arthropoda

Specimen R:
- Kingdom: Animalia
- Phylum: Mollusca

(ii) What are the two observable features you used to place specimens P and Q to their respective Kingdoms?
Specimen P: Presence of green leaves and vascular tissues
Specimen Q: Jointed appendages and segmented body

(b) Draw a well labeled diagram of specimen P.



(c)(i) What is the habitat of the specimen Q?
Terrestrial or moist land habitat.

(ii) Why is it important for a Biology student to know the habitat of the specimen Q?
- To understand its survival needs and adaptation features
- To predict its behavior and ecological role

(iii) Identify three observable features which help specimen Q to adapt its habitat.
- Hard exoskeleton for protection
- Jointed legs for movement
- Compound eyes for wide vision in searching food or avoiding predators

(d) In what ways the representative members of Kingdom in which the specimen Q belongs are advantageous to industrial development in Tanzania. Give three advantages.

- Pollination by insects boosts agricultural productivity
- Some arthropods are used in silk production (e.g., silkworms)
- Insects like bees produce honey which contributes to the economy