UCE - BIO 2 - 2024.

PROPOSED SCORING GUIDE

Candidate's Name: .....

Signature: .....

Random No.						Personal No.		

(Do not write your School/ Centre Name or Number anywhere on this booklet.)

553/2
BIOLOGY
Paper 2
(Practical)
Oct./Nov. 2024
2½ hours

Joseph Lomoi R.
0772194332

UGANDA NATIONAL EXAMINATIONS BOARD

Uganda Certificate of Education

BIOLOGY

Paper 2
(Practical)

2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES:

This paper consists of **two** *examination items. Answer* **both** *items in the spaces provided.*

Drawings should be made in the spaces provided. Use **sharp pencils** *for your drawings. Coloured pencils or crayons should* **not** *be used.*

No *additional sheets of writing paper are to be inserted in the booklet.*

Work on additional sheets of paper will **not** *be scored.*

© 2024 Uganda National Examinations Board

AnyScanner

Item 1

Rashid uprooted two maize plants from his garden and observed that the one from the northern part of the garden had few short roots and big leaves while the other from the southern part had many long roots and small leaves. At harvest time, the northern part had high yield while the southern part had low yield. Rashid was told that the difference in the yields from the two parts of his garden could be due to the difference in the ability of the two soils to retain water. Rashid wants to understand why the two parts of his garden had different yields.

Do n
writ
in th
marg

You are provided with soil samples **L** and **M** obtained from the two parts of Rashid's garden.

Task:

Design and carry out a scientific investigation to determine the part of the garden from which soil samples **L** and **M** were obtained. Use your results to explain the difference in the yields from the two parts of Rashid's garden.

Your design and investigation should include the following:

(a) Aim, hypothesis, variables, apparatus/ requirements.

Aim: An experiment to determine the drainage/ water retention of soil samples L and M P1
(award if soil samples are maintained)
Hypothesis: Soil sample L drains water faster than soil sample M and is suitable for high yield P1
Variables: Independent: soil type/soil particle size
Dependent: Volume of water collected P1
Controlled: -Volume of soil fixed at 30c
-Volume of water added 50c
List of apperatus and Materials
-2(100ml) measuring cylinders
-2(250ml) plastic beakers P1
-2 filter funnels
-cotton wool
-stop watch

- Soil sample L and M.
- Water
- 50ml measuring cylinder

(b) (i) Procedure to determine the ability of the two soil samples **L** and **M** to retain water.

Relevance C_1 Coherence C_1 Coherence C_1 P_1 Manggement of variables C_1

PROCEDURE.

i) $30cm^3$ of soil samples L and M were each measured using a measuring cylinder

(ii) cotton wool was plugged into the neck of each of the two filter funnels

(iii) Two measuring cylinders were each labeled L and M.

iv) Each funnel was placed on top of each measuring cylinder L and M and each funnel filled with soil samples L and M

v) $50cm^3$ of water was measured using a measuring cylinder/Beakers and each transfered into the filter funnel

vi) The stop clock/stop watch was started immediately/at the same time.

vii) When the water stopped dripping, the stop clock was stopped after 30 minutes and the volumes of water collected in each of the measuring cylinders from soil sample L and M were noted/and recorded.

05

Appropriate D2

Data Results

Soil sample	Volume of water added (cm^3)	Volume of water collected (cm^3)
L	30	10 – 18
M	30	8 – 10

Consistent D2

(ii) Results of the experiment.

Analysis of Results + AR-02

Soil sample L:

Volume of water added = $30\ cm^3$

Volume of water collected = $\frac{10+18}{2} = 1 \cdot 0\ cm^3$

Volume of water retained = Volume of water added − Volume of water collected

$= 30\ cm^3 - 14$

$= 16\ cm^3$

Soil Sample M:

Volume of water added = $30\ cm^3$

Volume of water collected = $\frac{8+10}{2} = \frac{18}{2} = 9\ cm^3$

Volume of water retained = Volume of water added − Volume of water collected

$= (30 - 9)\ cm^3$

$= 21\ cm^3$

(iii) Identify the part of the garden from which soil samples L and M were obtained.

Basing on the above results soil sample L was obtained from the Northern part of the garden with moderate drainage and water retention. Soil sample M was obtained from the southern part of the garden with low drainage, thus water logged with high water retention not aerated thus not good for maize growing AR-01

(c) Using your results explain to Rashid the difference in the yields from the two parts of the garden.

Soil sample L has moderate and less compact soil particles / has large soil particles that drain more water and retain moderately hence suitable for high yield of maize, because it is well aerated and rich in moisture needed for the maize plant. Nutrient rich soil

Soil sample M has small compacted soil particles that drain less water and retains more water. Therefore it is water logged and less aerated not suitable for maize growing thus, less maize yield. Nutrients not readily available.

Recomendation: I recommend the farmer Mr Rashid to always plant his maize in the northern part of the garden where soil sample L was obtained.

Item 2

Sarah had a healthy cow which gave her plenty of milk. Suddenly the cow started looking weak and the milk production reduced. On inspecting her cow, she picked some organisms from the skin around the eyes and udder. She also saw another type of organism moving along the destroyed wooden poles of the cow shade.

You have been provided with specimens **A** and **B** which are organisms Sarah collected.

Task:

(a) (i) With reasons identify any **two** taxa to which both specimens A and B belong.

Both specimen A and B belong to Kingdom Animalia.

Both belong to Kingdom animalia because;
- Both posses mouth for heterotrophic nutrition or feeding.
- Both posses Locomotary structures like legs
- Both posses sensory structures like antennae.

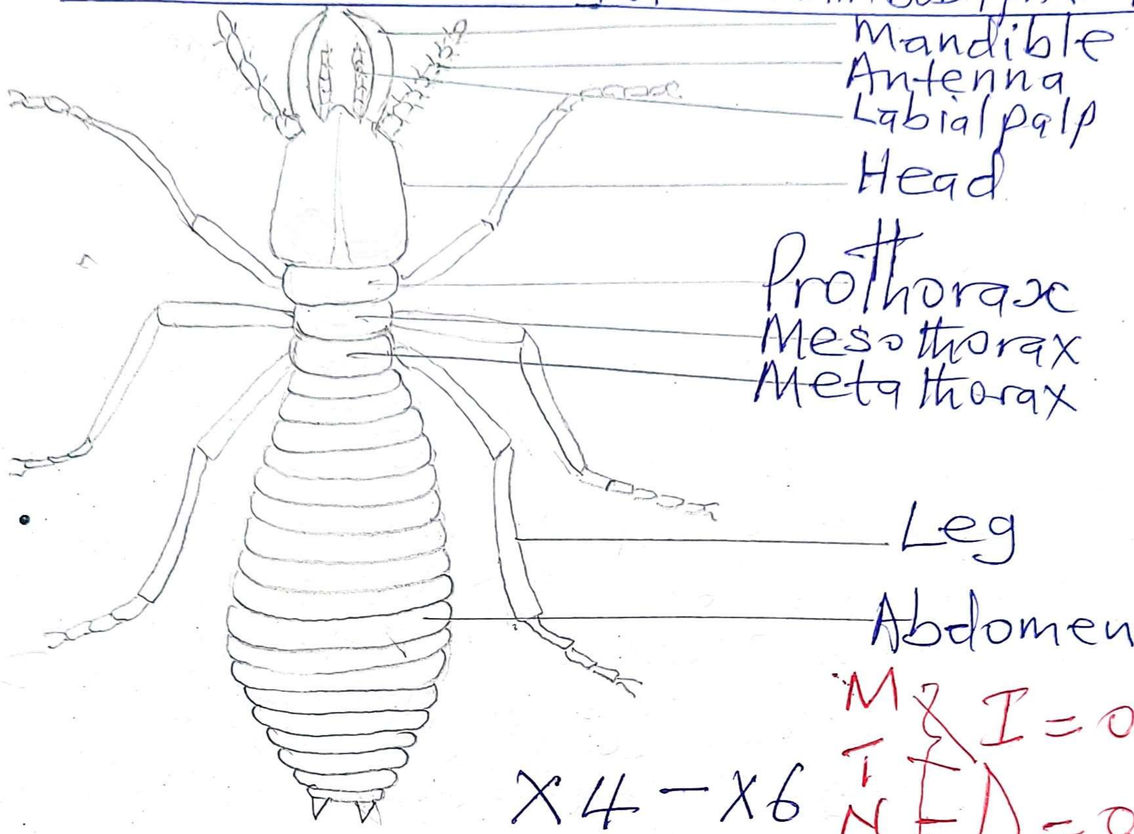
2. Both specimen A and B belong to the Phyllum Arthropoda because; I = 02
- Both posses cuteneous exoskeleton
- Both posses jointed appendages
- Both posses segmented body parts.

(ii) Explain how specimen **A** is able to survive on the cow.

Specimen A is able to survive on the cow due to;
- Possession of the spines and claws on legs, thus enabling holding onto the host/ cow's skin. U = 06
- Possession of the hardened mouth parts enabling piercing the cow's skin to extract blood using chelecers.
- Possession of small and relatively flattened body for easy attachment to a cow
- Possession of hardened/ cuteneous exoskeleton for protection

(b) Draw specimen **B** and label its main body parts.

A LABELED DRAWING OF THE MAIN BODY PARTS OF SPECIMEN B



M I N L A D

I = 01
D = 03
L = 03

NB The three Main body parts are
- Head
- Thorax
- Abdomen

(1-2) – 01 (3) – 02 (5-6) – 03

07

END