UGANDA NATIONAL EXAMINATIONS BOARD

Uganda Certificate of Education

BIOLOGY PRACTICAL INSTRUCTIONS

553/3 Inst. Sch.

October/November, 2023

CONFIDENTIAL

This information is given only to facilitate preparation of examination.

Great care should be taken that the information given below does not reach the candidates either directly or indirectly.

INSTRUCTIONS FOR PREPARING SPECIMENS AND APPARATUS

The teacher responsible for preparing specimens must ensure that candidates are provided with correct specimens and other materials as specified in these instructions. Specimens and solutions which have been assigned codes should be presented to candidates using those **codes only** and not any other identity. The head teacher **must** ensure that the teacher responsible for preparing the specimens hands in his/her trial results for the physiology/biochemistry question, properly sealed in a separate envelope and **firmly** fastened (attached) to the candidates' script envelope(s).

Each candidate should be provided with:

Freshly killed mature cockroach, labelled **Q**.

Freshly killed soldier termite, labelled **R**.

Stem of passion/pumpkin/gourd/bean with a tendril and a leaf, labelled **J**.

Stem of *Commelina* with sheath and two internodes, labelled **K**.

Rhizome of *Paspalum sp*, or rhizome of canna lily, labelled **L**.

10 cm^3 of irish potato extract, labelled **V**.
(*To prepare extract* **V**, *peel and crush* **250** g *of irish potatoes, add distilled water, decant and dilute to make* **1** *litre. Warm the extract but* **do not** *boil.*)

10 cm^3 of onion bulb extract, labelled **W**.
(*To prepare extract* **W**, *peel off the scale leaves and crush* **250** *g of onion bulbs, add distilled water, decant and dilute to make* **1** *litre.*)

5 cm^3 of 3% hydrogen peroxide solution, labelled solution **X**.

6 test tubes.

Hand lens.

10 ml measuring cylinder.

10 cm long piece of thread.

Access to:

Reagents for carrying out food tests.

Source of heat.

Distilled water.

Candidate's Name: .....

Signature: .....

Random No.						Personal No.		

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

553/3
BIOLOGY
PRACTICAL
Paper 3
Oct./Nov. 2023
2 hours

UGANDA NATIONAL EXAMINATIONS BOARD

Uganda Certificate of Education

BIOLOGY PRACTICAL

Paper 3

2 hours

INSTRUCTIONS TO CANDIDATES:

This paper consists of **three** *questions.*

Answer **all** *questions.*

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 this booklet.*

Work on additional sheets will **not** *be marked.*

FOR EXAMINERS' USE ONLY		
Question	**Marks**	**Examiner's Signature & No.**
1		
2		
3		
Total		

Turn Over

1. You are provided with solutions **V** and **W**. You are to determine their food contents. Carry out tests in table **1** and record your results in the table.

Table 1 *(15 marks)*

Tests	Observations	Deductions
(a) (i) To 1 cm^3 of **V** in a test tube, add 2-3 drops of iodine solution.		
(ii) To 1 cm^3 of **W** in a test tube, add 2-3 drops of iodine solution.		
(iii) To 1 cm^3 of **V** in a test tube, add 1 cm^3 of Benedict's solution and boil.		
(iv) To 1 cm^3 of **W** in a test tube, add 1 cm^3 of Benedict's solution and boil.		
(v) To 1 cm^3 of **V** in a test tube, add 1 cm^3 of sodium hydroxide solution followed by 4 drops of copper(II) sulphate solution.		
(vi) To 1 cm^3 of **W** in a test tube, add 1 cm^3 of sodium hydroxide solution followed by 4 drops of copper(II) sulphate solution.		
(vii) To 1 cm^3 of DCPIP in a test tube, add solution **V** drop by drop.		
(viii) To 1 cm^3 of DCPIP in a test tube, add solution **W** drop by drop.		

(b) Identify the food substance(s) present in;

(i) solution **V** only. (*01 mark*)

.....

(ii) both solutions **V** and **W**. (*02 marks*)

.....

.....

2. You are provided with specimens **J** and **K** which are parts of a plant.

(a) Identify specimens **J** and **K**. (*02 marks*)

J .....

K .....

(b) (i) Using observable features, state the function(s) of specimen **J** and **K**.

Functions of **J**. (*02 marks*)

.....

.....

.....

.....

Function of **K**. (*01 mark*)

.....

.....

(ii) Basing on structural features of specimens **J** and **K**, state **two** adaptations in each case for the functions stated in (b) (i).

Adaptations of **J**. (*02 marks*)

.....

.....

.....

.....

Adaptations of **K**. (*02 marks*)

.....

.....

.....

.....

(c) Give **three** structural differences and **two** structural similarities between specimen **J** and **K**.

Differences (*03 marks*)

Specimen **J**	Specimen **K**
(i)	(i) .....
.....	.....
(ii)	(ii) .....
.....	.....
(iii)	(iii) .....
.....	.....

Similarities (*02 marks*)

.....

.....

.....

.....

(d) Observe the leaf on specimen **J** and fully describe the leaf. (*04 marks*)

.....

.....

.....

(e) Draw and label specimen **K**. State the magnification of the drawing. (*04 marks*)

3. You are provided with specimen **Q** which is an animal.

(a) (i) Using a hand lens, observe **one** antenna of specimen **Q**. Describe its structure. (*03 marks*)

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.....

.....

(ii) Measure and record the length of the antenna and the length of the whole body of specimen **Q**.

Length of the antenna. (*01 mark*)

..... cm

Length of the whole body. (*01 mark*)

..... cm

(iii) Give the significance of the length of the antenna to the life of specimen **Q**. (*01 mark*)

.....

.....

.....

(b) Observe carefully the outer wing and inner wing of specimen **Q**. Give **one** similarity and **three** differences between the outer wing and inner wing.

Similarity (*01 mark*)

.....

.....

Differences (*03 marks*)

Outer wing	**Inner wing**
(i)	(i) .....
.....	.....
(ii)	(ii) .....
.....	.....
(iii)	(iii) .....
.....	.....

(c) Observe carefully the hind legs of specimen **Q** and give **four** adaptations of the legs to their functions. (*04 marks*)

(i) .....

.....

(ii) .....

.....

(iii) .....

.....

(iv) .....

.....

(d) Observe the dorsal side of the head of specimen **Q** using a hand lens. Draw and label the dorsal view of the head including the first segment of the thorax. State the magnification of the drawing. (*06 marks*)

END