Candidate's Name: .....

Signature: .....

Random No.					Personal No.		

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

P530/3
BIOLOGY
Paper 3
(Practical)
Nov./Dec. 2025
3¼ hours

UGANDA NATIONAL EXAMINATIONS BOARD

Uganda Advanced Certificate of Education

BIOLOGY

Paper 3
(Practical)

3 hours 15 minutes

INSTRUCTIONS TO CANDIDATES:

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

All *questions are* **compulsory**.

Write the answers in the spaces provided. **No** *additional sheets of paper should be inserted in this booklet.*

You are **not** *allowed to start working within the first* **15** *minutes. You are advised to use this time to* **read** *through the paper and ensure that you have all the apparatus, chemicals and specimens you require.*

For Examiners' Use only		
Question	**Marks**	**Examiner's Signature & No.**
1		
2		
3		
Total		

Turn Over

1. You are provided with specimen **R** which is freshly killed.

(a) Examine the sensory organs on the dorsal side of the head of the specimen.

(i) Identify and describe the structure of any **two** organs. *(03 marks)*

Organ **1**

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Organ **2**

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(ii) State the significance of each of the organs identified in (a) (i) in the life of the specimen. *(04 marks)*

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(b) Place specimen **R** with its ventral side uppermost and examine the structures on the head of the specimen. Cut away the prothoracic limbs, the left labial palp and right maxillary palp from the specimen.

Draw and label the remaining structures seen on the head and prothoracic segment. *(12 marks)*

(c) Turn the specimen dorsal side uppermost, cut away the wings, limbs and antennae from the specimen.

(i) Cut along the left lateral line of the abdomen of the specimen. Dissect to open the abdominal region only, displace to display the dorsal cuticle.

(ii) Clear off any unnecessary tissues to display the structures of the alimentary canal. Displace the parts of the alimentary canal to the left of the specimen.

Make a drawing of the displays and label only the structures on the ventral cuticle. *(15 marks)*

2. (a) You are provided with specimen **A** and solution **Q**. Carry out the following procedure to determine the activity of specimen **A**.

(i) Label **three** 50 ml measuring cylinders as **1**, **2**, and **3**.

(ii) Using a cork borer provided, obtain a potato cylinder from specimen **A** and trim it to 2 cm long. Cut the potato cylinder into small pieces and pound it to a paste. Add 10 cm^3 of distilled water, stir well and pour it into a boiling tube. Label the extract A_1.

(iii) Decant 5 cm^3 of A_1 into a measuring cylinder labelled **1** and add to it 2 cm^3 of solution **Q**. Immediately start the stop clock, while noting the volume of the mixture at zero (0) second. Record the volume in table **1**.

(iv) Read and record the volume of the content and froth in the measuring cylinder **1** at time intervals indicated in table **1**.

(v) Repeat the procedures (a) (ii) – (iv) using two potato cylinders each measuring 2 cm long. Label the extract A_2, and use the measuring cylinder labelled **2**.

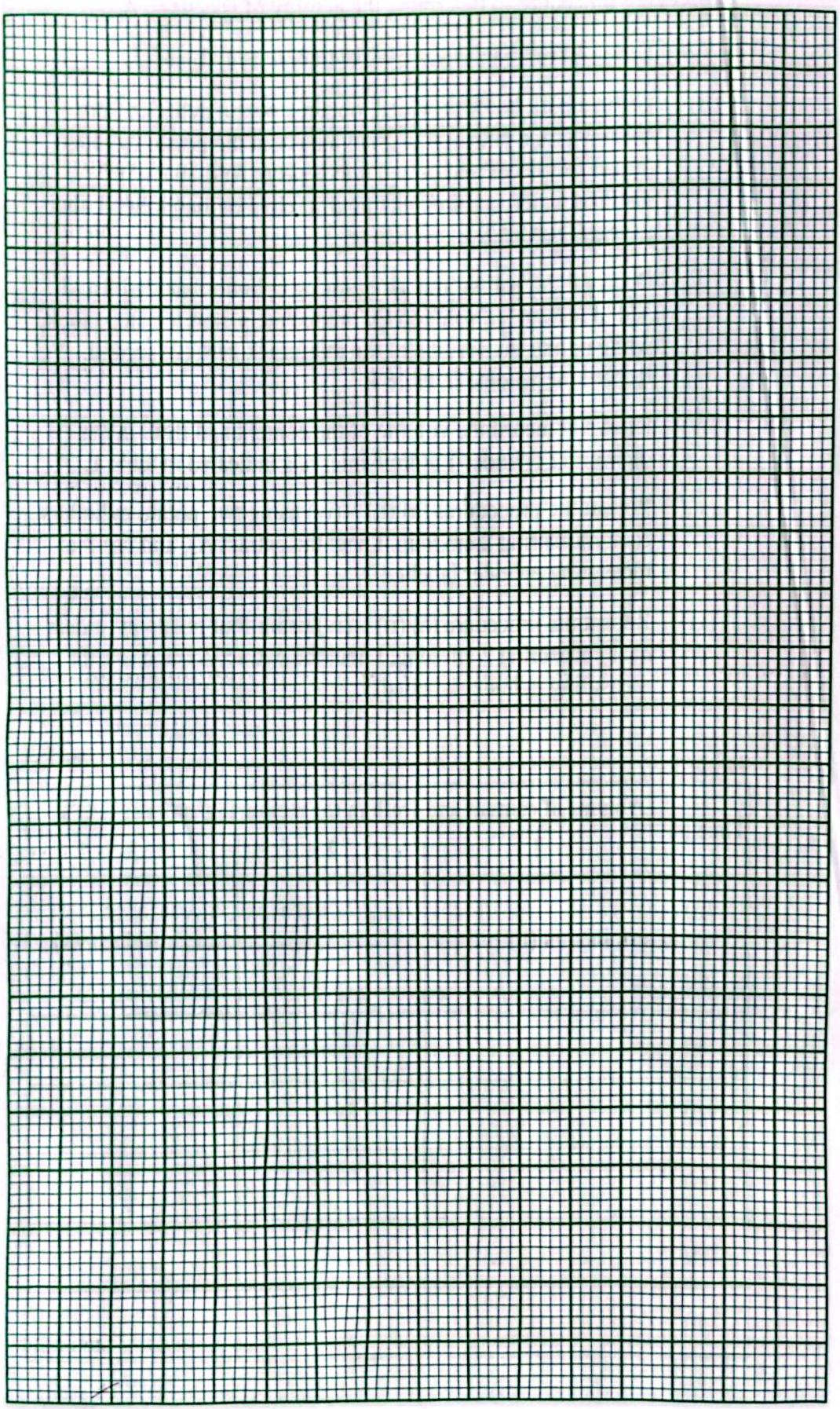
(vi) Repeat the procedure (a) (ii) – (iv) using four potato cylinders each measuring 2 cm long. Label the extract A_3, and use the measuring cylinder labelled **3**.

(10½ marks)

Table 1

Time (s)	Volume of content and froth in the measuring cylinder (cm^3)		
	1	2	3
0			
40			
80			
120			
160			
200			
240			

(b) (i) Represent the data in table 1 on a suitable graph. *(9½ marks)*



(ii) State what is being investigated in this experiment. (*01 mark*)

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(iii) From the graph plotted in (b) (i), determine the rate of reaction in cm^3/s for each of the mixtures between 20 seconds and 90 seconds. (*Show your working.*) (*4½ marks*)

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(iv) Account for the difference in the rate of reactions you have determined in (b) (iii). (*06 marks*)

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(v) Predict what would happen to the shape of the graph for the measuring cylinder **3** if the experiment was run for the next 100 seconds. (*Give a reason for your prediction*). (*02 marks*)

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(c) Explain the biological significance of the results of the experiment to the rate of physiological activities in the human body. (*04 marks*)

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3. You are provided with specimens **J, K, L** and **M.**

(a) Using observable features of specimens **J** and **L**, classify the plants from which they were picked into two separate taxonomic groups. (*Where necessary use a hand lens.*)

(i) Specimen **J** (*03 marks*)

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Observable features .....

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(ii) Specimen **L** (*03 marks*)

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Observable features .....

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(b) Remove one of the outermost florets and one floret from the middle part of specimen **K**. Examine the two florets using a hand lens and state **two** differences between them. (*02 marks*)

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(c) Describe the florets and their arrangements in the following specimens:

(i) Specimen **J** *(03 marks)*

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(ii) Specimen **K** *(03 marks)*

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(iii) Specimen **M** *(02 marks)*

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(d) How are the arrangements in (c) (i) and (c) (ii) useful for the survival of each of the specimens in its habitat?

(i) Usefulness of the arrangements in (c) (i). (*03 marks*)

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(ii) Usefulness of the arrangements in (c) (ii). (*03 marks*)

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(e) State any **two** adaptations in specimen **L** for pollination. (*02 marks*)

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(f) Obtain the ovary of specimen **L** and cut to get a thin transverse section of it. Mount the section on a glass slide and observe under low power of a light microscope. Draw the structures visible without labelling. State the magnification of your drawing. *(4½ marks)*

END

Each candidate should be provided with the following:

A freshly killed mature cockroach labelled, specimen **R**

2 large sized Irish potatoes labelled, specimen **A**

10 cm^3 of 3 % hydrogen peroxide solution labelled, solution **Q**

10 cm^3 of 0.8 M commercial sucrose solution labelled, solution **P**

Hibiscus flower labelled, specimen **L**

Commelina sp flower labelled, specimen **N**

Inflorescence of:

Biden pilosa labelled, specimen **K**
Panicum maximum labelled, specimen **J**
Bougainvillea sp labelled, specimen **M**

A cork borer of 0.9 cm or 1 cm diameter

3 measuring cylinders (50 ml)

1 measuring cylinder (10 ml)

4 boiling tubes

3 test tubes

A stop clock

2 plastic beakers (250 ml)

1 Thermometer

2 filter papers

Knife/scalpel/blade

Dissecting kit, board and pins

Hand lens

Mortar and pestle

Light microscope, slides and cover slips

A stirring rod

Labels

Petri dish with cover

A piece of thread (20 cm long)

Access to:

Heat source

Hot water

Distilled water

Reagents for carrying out food tests