

PROPOSED GUIDE

NAME To WASSWA ENOCK

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Biology

Practical

June/July

Paper 2

2 hours



ACEITEKA JOINT MOCK EXAMINATIONS 2023 UGANDA CERTIFICATE OF EDUCATION BIOLOGY PRACTICAL

Paper 2

Time: 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 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 and number
1		
2		
3		
Total		

Δ (2% Hydrogen peroxide solution)

You are provided with a large sized Irish potato labeled C and solution D which is of complex nature, Obtain 6 cylinders from C using a cork borer and trim them to a uniform length of 3cm. label six test tubes 1,2,3,4,5 and 6, Boil one whole cylinder for 5 minutes and allow it to cool

Pour 4cm³ of solution D into test tube 1,2,3,4,5 and 4cm³ of water in test tube 6 and proceed as follows (12 marks)

Procedure	Observations	Deductions
i) To test tube 1 add one whole cube	Moderate effervescence or Moderate bubbling	Moderate breakdown of solution Δ
ii) To test tube 2, add one whole cube after cutting it into 8 pieces	Rapid / vigorous effervescence Accept very many / many bubbles	Rapid breakdown of solution Δ
iii) To test tube 3, add one boiled cylinder	No effervescence No bubbles given off Reject No observable change	No breakdown of solution Δ
iv) To test tube 4, add 1cm ³ of hydrochloric acid followed by one whole cylinder	Slow effervescence All few bubbles	Slow breakdown of solution Δ
v) To test tube 5, add one whole cylinder followed by 1cm ³ of hydrochloric acid	Less moderate effervescence	Less moderate decomposition / breakdown of solution Δ
vi) To test tube 6, add one whole cube	No effervescence No bubbles given off Reject No observable change	No breakdown of water.

Reject
H₂O₂
Hydrogen peroxide

Accept decomposition

b) State and explain the difference in the results obtained in test tubes

(4 marks)

i) 1 and 2

In 1, there is Moderate effervescence while in 2, there is Rapid effervescence, this is because cut in test tube 2, cutting the cylinder into 8 pieces exposes more surface area, therefore more enzyme Catalase hence rapid breakdown of solution A, than but less surface area in 1 exposed

ii) 4 and 5

In 4, Slow effervescence while in 5, less moderate effervescence, this because, addition of hydrochloric acid first in (iv), provides acidic medium, which is not suitable for active substance / enzyme Catalase to Catalyse the breakdown of solution A

c) With evidence from the table above, state the properties of the active substance exhibited in the experiment.

(2marks)

Test tube (s)	Property
iii	✓ Denatured by high temperatures
vi	✓ specific in action

Award any correct 2

d) Why were cylinders of the same size used in the experiment?

(1 mark)

So as to get consistent results. ✓

M (Bee)
N (Cockroach)

2. You are provided with specimen M and N which belong to the same phylum, using a hand lens observe them and answer the questions below.

a) State the phylum to which specimen M and N belong giving two reasons. (3 marks)

Phylum..... Arthropoda ✓

Reasons

~~Have~~ / Presence of segmented body ✓

~~Have~~ / ~~Presen~~ Presence of jointed limbs ✓

~~Have~~ / Presence of exoskeleton ✓ *Any correct 2*

b) Describe the differences in the features on the head and thorax of specimen M and N. (4 marks)

Head

Specimen M	Specimen N
A pair of short antennae ✓	A pair of long antennae
Blunt mandibles	✓ Sharp mandibles
Lacks labial palps	✓ Has labial palps
Has proboscis	✓ Lacks proboscis

Any correct 2

Thorax

Specimen M	Specimen N
hind legs are hairy ✓	hind legs have pointed spines
outer wings are larger ✓	outer wing is narrow
outer wings are thin/membranous ✓	outer wings are thick

Any correct 2

~~outer wings transparent~~

Shorter wings

All wings are transparent ✓

~~outer wings opaque~~

longer wings

inner wings transparent

c) Measure the length of the antenna of specimen N and the body and calculate the ratio of the length of the antenna and the body (2 marks)

Length of the antenna... 10mm - 80mm ✓
 Length of the body... 10mm - 80mm ✓
 Ratio... 1:1 ✓

State the significance of the ratio obtained in c) above. (1 mark)

The ratio is 1:1 to detect/sense around the whole body, or The antenna is equal to the body length; to detect/sense around the whole body.

d) Describe the inner wings of specimen N. (2 marks)

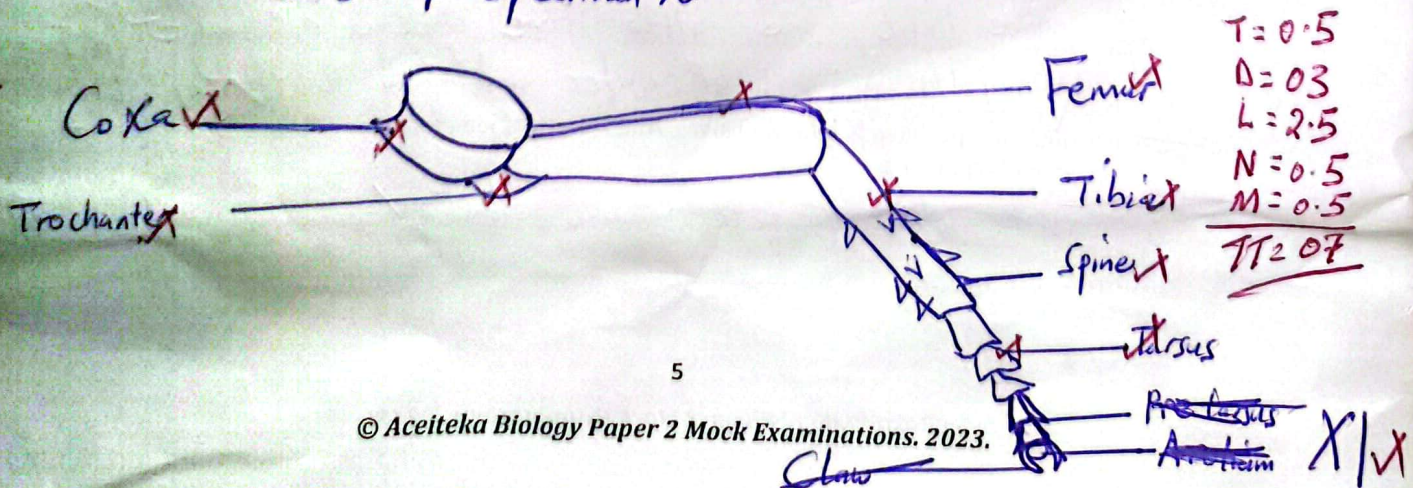
Membranous / thin, large / broad, notched margin, folded, and supported by branching networks of veins. Have three main veins. Max of 3 marks

e) From your description in d) above, how are the wings adapted to perform their function. (2 marks)

Large / broad for increased surface area for flight.
 Thin membrane make light for flight

f) Draw and label the first seven segments from the body, of the hind limb of specimen N. State your magnification. (7 marks)

Drawing of the first seven segments from the body of the hind limb of specimen N



Y (sprouting Bryophyllum) X (Ginger)

3. You are provided with Specimens X and Y which are plant parts

a) Using two observable features state the plant part they are

(4 marks)

Specimens	Part of the plant	Observable feature
X	Stem ✓	- Has buds - Has internodes - Has Scale leaves
Y	Leaf ✓	Has leaf stalk Has lamina Has Leaf base

b) i) State one structural similarity between Specimen X and Y

Both have buds ✓

(1 mark)

ii) State one common function performed by both X and Y.

Vegetative propagation ✓

(1 mark)

Reject asexual reproduction
see propagation table

c) From the observable features of Specimen Y suggest what has enabled the plant from which the specimen was obtained to be successful in its habitat

(4 marks)

- Thick and succulent to store food and water to withstand drought ✓
- Buds for vegetative propagation ✓
- Has Chlorophyll to trap sunlight for photosynthesis ✓
- Waxy cuticle to minimize water losses ✓
- Broad lamina to increase surface area for trapping of more light and allow more gaseous exchange for photosynthesis ✓
- Veins transport of water and food substances. ✓

d) Using a knife cut Specimen X into two halves. Add 2 drops of iodine solution on the cut surface and state your observation.

The white surface turns black ✓

(1 mark)

ii) From your observation, state one other function performed by Specimen X.
(1 mark)

Store food for the plant in form of starch ✓

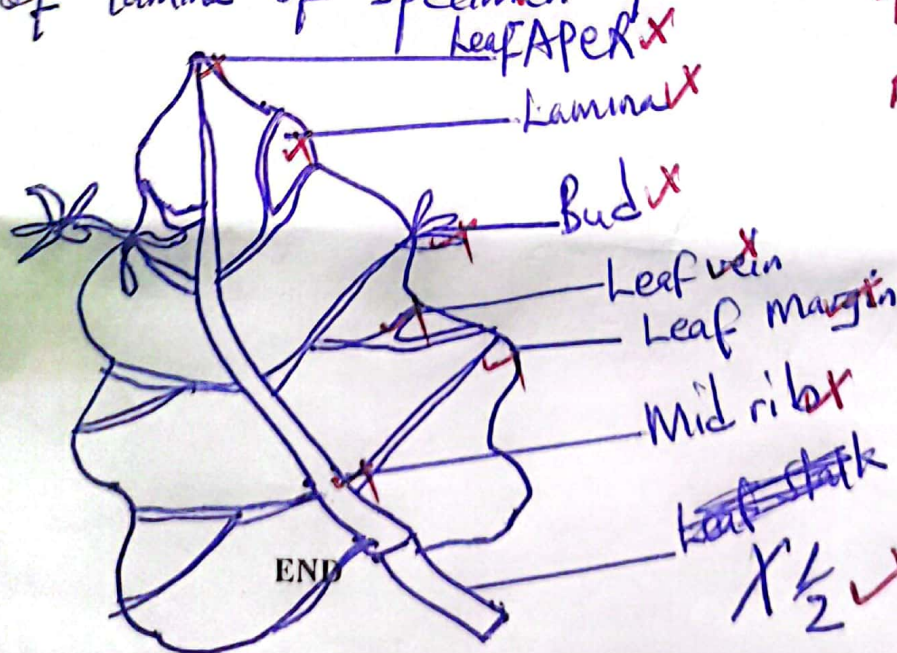
e) Examine Specimen X and describe how it is propagated. (1½ marks)

~~Vegative~~ Vegetatively propagated from small sections of the rhizome, called sets.

— Sets are produced by cutting a small 3-6 cm from a living rhizome. Each piece should possess at least one living bud which will produce shoots.

f) In the space below draw and label the lamina of Specimen Y. (7 marks)

Drawing of lamina of specimen Y



$$T = 0.5$$

$$M = 0.5$$

$$N = 0.5$$

$$L = 0.5$$

$$\Delta = 0.3$$

$$\frac{T + M + N + L + \Delta}{5} = \frac{0.5 + 0.5 + 0.5 + 0.5 + 0.3}{5} = \frac{2.3}{5} = 0.46$$

$$1 \frac{1}{2}$$