2023 P553/2-MARKING GUIDE

Name: To WASSWA ENOCK ..... Index No.....

School: PRACTICAL (P2) - MARKING GUIDE ..... Signature: .....

0701300439/0762867639

553/2
BIOLOGY
(PRACTICAL)
PAPER 2
July/August
2 hours

WAKISSHA JOINT MOCK EXAMINATIONS

Uganda Certificate of Education

BIOLOGY

(PRACTICAL)

Paper 2

2 hours

INSTRUCTIONS TO CANDIDATES:

- This paper consists of **three** questions.
- Answer **all** questions.
- All answers should be written 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 will **not** be marked.

FOR EXAMINER'S USE ONLY.

Question	Marks	Examiner's No. & Initials
1		
2		
3		
TOTAL		

A (Fresh Irish potato) B (Fresh Carrot)

1. You are provided with specimens A, B and solution Q.
Peel specimens A and B.

Cut four cubes from specimen A, each measuring 1cm × 1cm × 1cm.
Also cut one cube from specimen B of the same size.
Carry out the procedure below.

(i) Cut one of the cubes of A into four equal pieces.
(ii) Cut the second and third cube, each into eight equal pieces.
(iii) Leave the fourth cube intact.
(iv) Cut the cube of specimen B also into eight equal pieces.
(v) Label the boiling tube as A_1 and four test tubes as A_2, A_3, A_4 and A_5
(vi) Boil the eight pieces cut from the third cube of A in $5cm^3$ of water for 5 minutes. (keep the pieces of each cube separate)
(vii) Measure and add 5 cm^3 of solution Q to the boiling tube and to each of the test tubes A_2 to A_5.

(a) To each test tube and boiling tube, add the cut cubes as indicated in table 1 below.
Record your observations and deductions (10 marks)

TABLE 1

Test tube/ Boiling tube	Contents	Observations	Deductions
A_1	Q + intact cube of A	Moderate effervescence ✓	Moderate ✓ breakdown of solution Q
A_2	Q + four pieces of A	Fast effervescence ✓	Fast breakdown of solution Q
A_3	Q + eight fresh pieces of A	Rapid / Vigorous ✓ effervescence	Rapid breakdown of Solution Q
A_4	Q + eight boiled pieces of A	No effervescence / No bubbles given off	No breakdown of solution Q
A_5	Q + eight Pieces of B	Slow effervescence ✓	Slow breakdown / decomposition of Solution Q

Reject H_2O_2 and Hydrogen peroxide

Mark 2 to mark 2

(b) Explain the difference in your results in test tubes;

(i) A_1 and A_2 (02 marks)

In A_1 there is Moderate effervescence while in A_2 there is Fast effervescence, this is because Cutting the tissue into more pieces (4) in A_2 increases surface area, therefore increased exposure of enzyme Catalase to breakdown Q.

(ii) A_3 and A_4 (02 marks)

Mark = 2½ and 2

In A_3 there is rapid effervescence while in A_4, there is no effervescence, because Catalase enzyme was denatured on boiling tissue A, therefore no breakdown of Solution Q

02 mark

(iii) A_3 and A_5 (02 marks)

In A_3 there is rapid effervescence while in A_5 there is slow effervescence, this is because there is more Concentration of Catalase enzyme in tissue A than B, hence slow decomposition of Solution Q in A_5

02 marks

(c) State what was being investigated in this experiment. (03 marks)

Award for only 3 correct

Mark 3 if more

Effect of temperature on the activity of enzyme

Effect of surface area on exposure of more active substrate

Effect of enzyme Concentration on the rate of breakdown of Q

Effect of enzyme Concentration in different tissues

(d) State the role of specimen A and B in the experiment. (01 mark)

Source of enzyme Catalase that breakdown Solution Q.

L (Lumbar) K (Cervical Vertebra)

2. You are provided with specimens K and L which are animal structures.

(a) With reasons, state the identity of the animal structures.

Identity; K; Cervical Vertebra. L; Lumbar Vertebra (01 mark)

Reasons; (02 marks)

For K; Has short neural spine; Has wide neural Canal

For L; Has narrow neural Canal

Award For any other Correct Feature

Take 03 mark

(b) Suggest the part of the body of the animal from which each specimen was obtained. Give a reason in each case. (04 marks)

Specimen	Part of the body	Reason
K	Neck region ✓	Has short ~~vertebra~~ metapophysis with facets.
L	Abdominal region ✓	- Has two long metapophysis - Has two long transverse processes

Award for any other correct reason

(c) Describe the structure of specimen L. (03 marks)

- Has long transverse process facing forward, ~~with~~
- Extra processes called metapophyses for muscle attachment
- Larger and massive Centrum; A wide neural ~~Canal~~ Canal,
- Abroad and prominent neural spine.

Award a mark for described part.

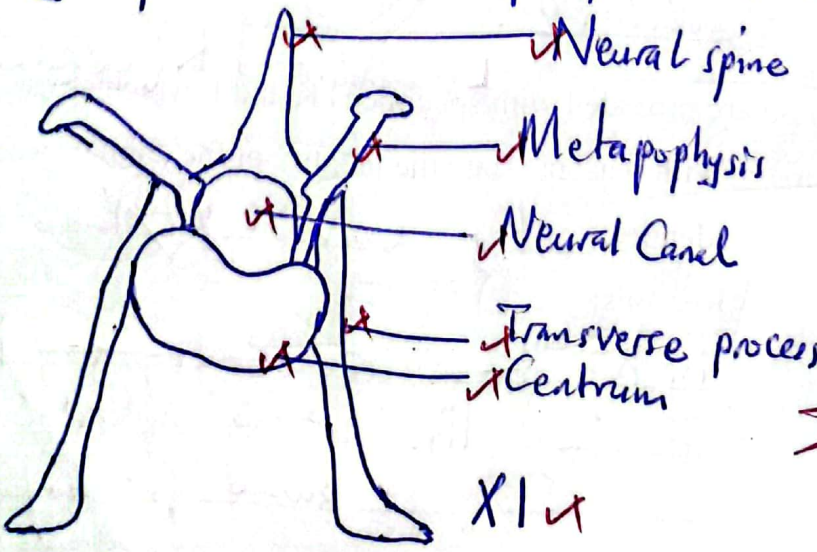
(d) State **three** structural differences between specimens K and L. (04 marks)

Specimen K	Specimen L
- Has wide neural Canal ✓	Has narrow neural Canal
- Has short metapophysis ✓	Has long metapophysis
Has short neural spine ✓	Has long neural spine

Award any other correct differences

(e) Draw and label the anterior view of specimen L. (06 marks)

Drawing of anterior view of specimen L ↓



T = 0·5
Δ = 2·5
L = 2·5
N = 0·5
M = 0·5

T = 6½

S (Onion bulb)

3. You are provided with specimens R and S. R (A piece of Rhizome of Cannalily or Ginger with buds and adventitious roots)

a) Observe the specimens and give the identity of each using observable characteristics features.

Identity of R; Rhizome / Stem / underground stem (01 mark)

Observable features; (02 marks)

⇒ Scale leaves ; ⇒ Internode ✓

⇒ Node ✓ ; ⇒ Swollen stem

Award any Correct 2 points. Total = 02 marks

Identity of S; Bulb (01 mark)

Observable features; (02 marks)

Has Scale leaves ; Has adventitious roots

Has short stem / Has Condensed Stem

02 marks

Award any Correct 2

b) Basing on your observations, state the class to which specimen S belongs. Give **two** reasons to support your answer.

Class; Monocotyledonae ✓ Reject Monocotyledons (01mark)

Reasons; (02marks)

- Leaves have parallel Venation ✓
- Has adventitious roots. ✓

02 marks

c) Examine specimen S and describe its leaves. (03 marks)

Fleshy closely packed, Curved outwards, tapering each at the apex ✓

They are dry scales

Total = 03 marks

d) Explain how specimen R is suited for survival in its habitat. (02marks)

Has buds for Vegetative propagation ✓

Has Scale leaves for protection ✓

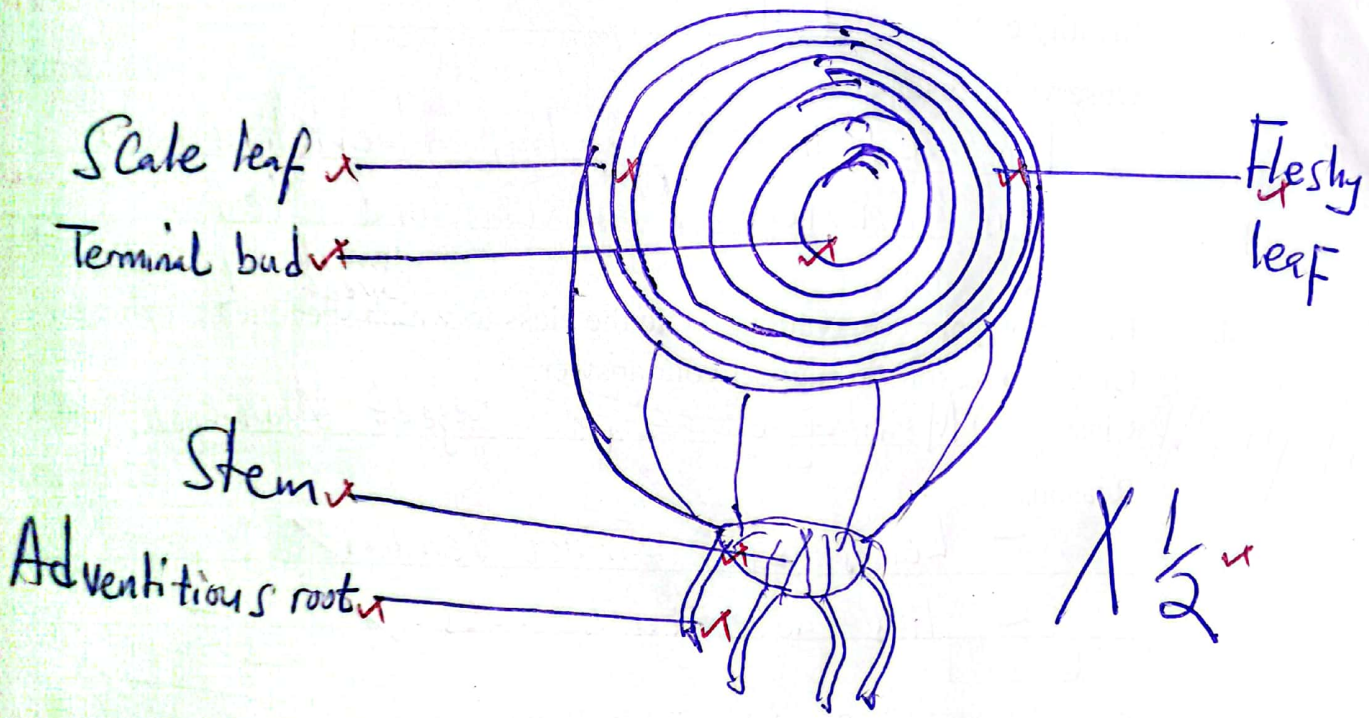
Has It is swollen to store water and food molecules to survive droughts

Award any Correct 2

e) Cut specimen S transversally into two halves. Draw and label one half.
(06 marks)

Drawing of transverse

Drawing of transverse section of specimen S



T = 0.5
D = 2.5
L = 2.5
M = 0.5
N = 0.5

TT = 6 ½

"WASSWA ENOCK" Always

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END