

**THE KENYA NATIONAL EXAMINATIONS COUNCIL**  
**Kenya Certificate of Secondary Education**

**231/3**

*Marking scheme*

**BIOLOGY**

(Practical)

**Mar. 2022 – 1¾ hours**

*Mumy*  
*0808*  
**Paper 3**



Name .....

Index Number .....

Candidate's Signature .....

Date .....

**Instructions to Candidates**

- Write your name and index number in the spaces provided above.
- Sign and write the date of examination in the spaces provided above.
- Answer **all** the questions in the spaces provided.
- You are required to spend the first 15 minutes of the 1¾ hours allowed for this paper reading the whole paper carefully before commencing your work.
- Additional pages must not be inserted.
- This paper consists of 7 printed pages.**
- Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.**
- Candidates should answer the questions in English.**

**For Examiner's Use Only**

Question	Maximum Score	Candidate's Score
1	14	
2	14	
3	12	
<b>Total Score</b>	<b>40</b>	

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P-bean

- E - Talcour 1.  
 F - Marra (leaf)  
 G - Lantana (antennae)  
 H - Begonia (leaf) (twig)  
 J - Jacaranda

(a) You are provided with plant specimens labelled E, F, G, H, and J. Use the specimens to develop a dichotomous key that can be used to identify the plants from which they were obtained based on the following characteristics in the order they are given: (6 marks)

- (i) Leaf form  
 (ii) Leaf venation  
 (iii) Leaf colour

1 a) leaf simple . . . . go to 2  
 b) leaf compound . . . . J

2 a) leaves/leaf network veined . . . . go to 3  
 b) leaves/leaf parallel veined . . . . F

3 a) leaves/leaf Green / Non-Variiegated . . . . G / H, go to 4  
 b) leaves/leaf Non-green / Variiegated . . . . E

4 a) leaf Margin serrated . . . . G / H  
 b) leaf Margin smooth . . . . H / J

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(b) Account for the likely observation if fresh specimen E was exposed to light and tested for starch.

(3 marks)

Green part/part with chlorophyll will turn blue black  
(with iodine solution/iodine) due to presence of starch  
Since photosynthesis has occurred. White part turn  
brown/retain iodine solution; due to absence of starch  
Since photosynthesis has not occurred.  
(c) Explain one observable feature that adapts plants from which specimen G and H were obtained to a dry environment.

G

(2 marks)

Rough/hairy leaf surface; to reduce transpiration.  
leaves fold; to reduce transpiration.

H

(2 marks)

Shiny/glossy leaf surface; to reduce transpiration  
Folding of leaves; to reduce water loss.

(d) Besides leaf characteristics, state one other observable characteristic on the plant from which specimen F was obtained that enables it to be placed in its class. (1 mark)

Fibrous root system;  
Floral parts in three/multiples of three  
Act; one cotyledon.

2. You are provided with solution M which is a food substance.

### Procedure

- (a) Using the reagents provided, test for the food substance present in substance M and complete the table below. (12 marks)

Food Test	Procedure	Observation	Conclusion
Starch	To about 2ml of food substance/M (in a test tube); Add (2 drops) of iodine solution;	Colour of iodine retained / yellow; Key: -No change -No observable change; Ate; No colour change	starch absent
Vitamin C (Ascorbic acid)	To (about 2ml of) DCPIP in a test tube; Add (a drop of M); food substance / M	DCPIP is decolourised or DCPIP becomes colourless;	Vitamin C present
Lipids	Put 1ml (a drop) of the food substance / M on to the filter paper / plain paper (between the drop & dry)	No translucent mark left (on the filter paper)	Lipids absent

Held against a source of light;



- (b) State two precautions one should observe while conducting the experiment in 2(a). (2 marks)

✓ Avoid contamination of reagents / apparatus / Avoid mixing of droppers / use clean apparatus,  
 ✓ Avoid burning of filter paper / plain paper when drying,  
 ✓ Avoid spilling / misusing of reagents / fumes substance;

3. You are provided with specimen N and P which are plants of the same species grown under different conditions.

- (a) State two observable differences between the two specimens. (2 marks)

N	P
yellow leaves / white / green / yellow stem	Green leaves / Green stem
small leaves	large / big leaves.
long stem / tall stem / long internodes / short internodes;	thick stem.
thin stem	strong / firm stem.
Weak / fragile / feeble / thin stem	



(b) (i) Name the phenomenon observed in specimen N.

(1 mark)

*Etiolation;*

(ii) Explain how the knowledge on the phenomenon named in b(i) is applied in agriculture.

(2 marks)

*Proper spacing / thinning / pruning / picking out / weeding / using a transparent material / polythene on a green house; to enable adequate penetration of light for the crop.*

(c) Account for the appearance of specimen N.

(3 marks)

*The specimen is weak / tall / long / thin; because they were grown in a darkness; / hence absence of light / insufficient light; in darkness there is high concentration of auxin in shoot tip that stimulate faster elongation; OR  
The specimen has small / yellow leaves / white stem / lack of chlorophyll; because they were grown in darkness; hence couldn't carry out photosynthesis / synthesis of chlorophyll;*



- (d) State two other environmental factors necessary for seed germination apart from light. (2 marks)

Oxygen;

Water / moisture;

Optimal / optimum temperature / warmth;

- (e) State two observable features on the specimens that make them be placed in the same Class. (2 mark)

Tap root system;

Rebulate / Network Venation / Branched Venation /

Net-vened leaves;

Broad leaves / lamina;

Compact petiole;

etc; Presence of two cotyledons;