

THE KENYA NATIONAL EXAMINATIONS COUNCIL
Kenya Certificate of Secondary Education

231/3

Marking scheme;

BIOLOGY

0802 Paper 3

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Mar. 2022 - 1 $\frac{3}{4}$ hours



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 1 $\frac{3}{4}$ 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 | |
| Total Score | 40 | |



P- Bean

2

E- Tree colour 1.

F- Marigold (leaf)

G- Lantana (anther)

H- Bougainvillea (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-variegated - - G/H, go to 4
b) leaves/leaf Non-green/Variegated - - - E

4 a) Leaf Margin serrated - - - G/H
b) Leaf Margin smooth - - - H/I

- (b) Account for the likely observation if fresh specimen E was exposed to light and tested for starch. (3 marks)

Green parts/parts 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 threes/multiples of three

Acc; 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 / brown; Res; -no change -No observable change; Acc; No colour change | starch absent |
| Vitamin C (Ascorbic acid) | To (about 2ml of) 'DCPIP in a test tube' Add (a drop of the) food substance / M | DCPIP is decolourised or DCPIP becomes colourless; | Vitamin C present |
| Lipids | Put / sub (a drop of the food substance / M) on to the filter paper / plain paper (allow the drop to dry) Hold against a source of light; | No translucent mark left (on the filter paper) | Lipids absent |

- (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/food 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 stem/short internodes; |
| thin stem | thick stem. |
| Weak/fragile/feeble/fain stem | strong/firm 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/narrists;

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

Tap root system;

Retiulate/Network Venation/Branches Venation/

Net-Veined leaves;

Broad leaves/lamina;

Compact petiole;

Acc; presence of two cotyledons;

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