EXAMINATIONS COUNCIL OF ESWATINI
Eswatini General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

BIOLOGY **6884/04**

Paper 4 Alternative to Practical **October/November 2020**

1 hour

Candidates answer on the Question Paper.

Additional Materials: ruler in millimetres.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on the spaces provided.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams, graphs or rough work.
Do **not** use staples, paper clips, glue or correction fluid.
Do **not** write on the barcode.

Answer **all** questions.
You may use an electronic calculator.

You may lose marks if you do not show your working or if you do not use appropriate units.
The number of marks is given in brackets [ ] at the end of each question or part question.

For Examiner's Use	
1	
2	
Total	

This document consists of **6** printed pages and **2** blank pages.

[Turn over

1 **(a)** Iodine solution is used to test for the presence of starch.

In an investigation, students were provided with a starch solution, made by adding water to starch powder, and a solution of amylase.

The following procedure was carried out and their results were recorded in Table 1.1

(i) Pour 5 cm^3 of the starch solution into each of the test-tubes labelled **A** to **F**;

(ii) Add 3 drops of iodine solution to test-tube **A**, shake gently and record the colour in Table 1.1;

(iii) Add 5 drops of amylase solution to each of the 5 test-tubes **A** to **F** and shake gently;

(iv) After 2 minutes add 3 drops of iodine solution to test-tube **B**, shake gently and record the colour in Table 1.1;

(v) Repeat step **(iv)** for test-tubes **C** to **F** at 2 minute intervals for 10 minutes;

(vi) Complete the Table 1.1 by writing the conclusions from the observations. [3]

Table 1.1

test-tube	time/min	observation	conclusion
A	0	blue/black	
B	2	blue/black	
C	4	dark blue	
D	6	blue	
E	8	brown	
F	10	brown	

(b) Suggest an advantage of using the starch as a powder when preparing the starch solution.

.....

..... [2]

(c) Explain the importance of shaking the mixture gently in steps **(a)(ii)** and **(iv)**.

.....

..... [1]

(d) Explain the observation between 8 minutes and 10 minutes.

.....

.....

..... [2]

(e) State the purpose of test-tube **A** in the investigation.

..... [1]

(f) Name **one** independent variable in this experiment.

..... [1]

(g) State **two** measures that have been taken to make the experiment a fair test.

1 .....

2 ..... [2]

(h) State a conclusion that can be drawn from this investigation.

.....

..... [1]

(i) Describe how the reliability of the results can be increased.

.....

..... [2]

(j) Predict and explain the observation that would be made at 10 minutes if boiled amylase solution was used.

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.....

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..... [3]

(k) Describe how the investigation could be modified to determine the optimum pH for the amylase enzyme.

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.....

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..... [4]

[Total: 22]

[Turn over

2 **(a)** Fig. 2.1 shows 5 dicotyledonous leaves labelled **G** to **M**.

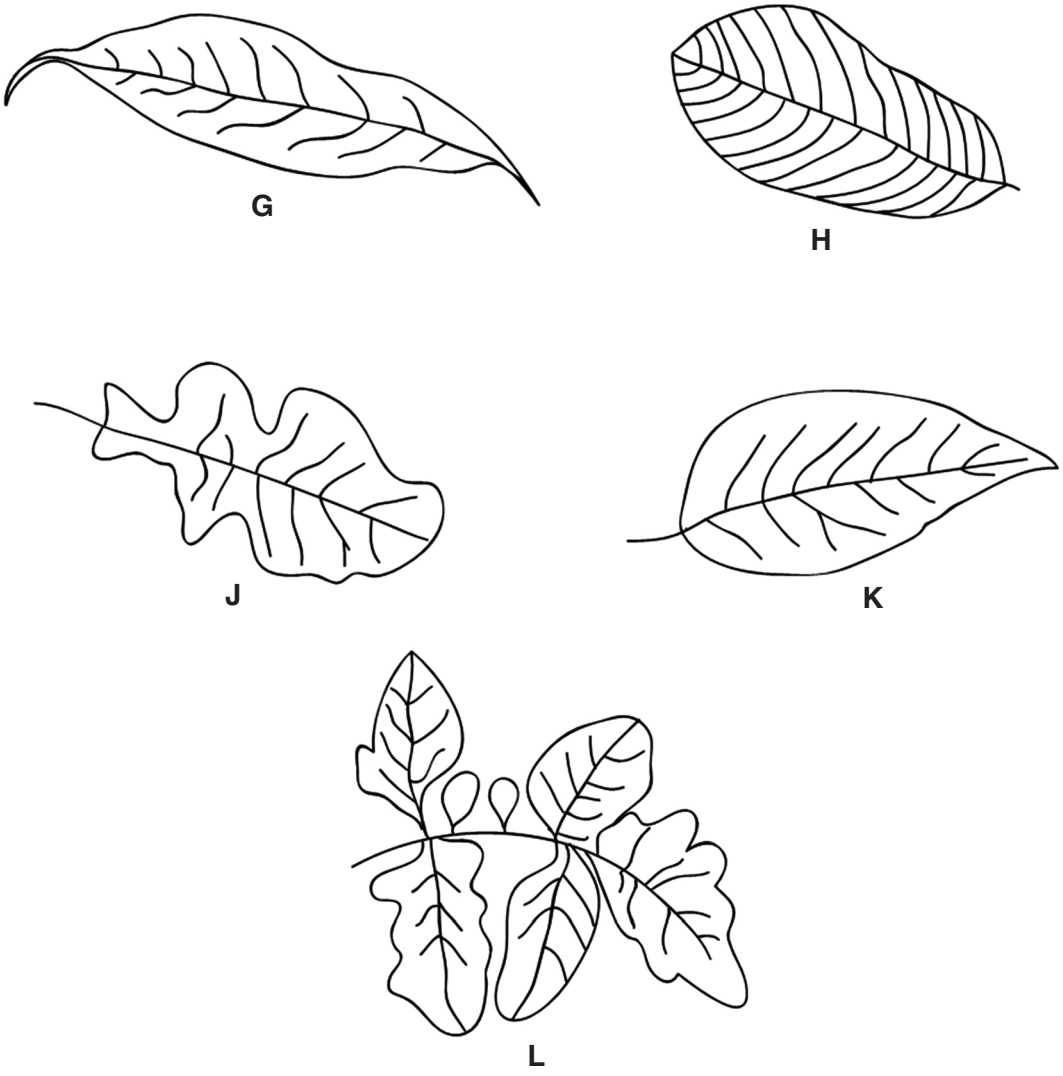

Fig. 2.1

(i) Use the following dichotomous key to identify and name the leaves **G** to **L**.

1	**(a)**	lobed …….....	go to 2
	(b)	not lobed …….....	go to 3
2	**(a)**	made of leaflets ….....	*Solanum lycopersicum*
	(b)	with no leaflets ……..…….....	*Brassica oleracea*
3	**(a)**	narrow with jagged margins ....…….....	*Prunus persica*
	(b)	broad with smooth margins	go to 4
4	**(a)**	stalk long	*Persea americana*
	(b)	stalk short	*Psidium guajava*

G .....

H .....

J .....

K .....

L ..... [5]

(ii) State **two** visible features that identify the leaves as dicotyledons.

1 .....

2 ..... [2]

(iii) Make a large drawing of leaf **J** and label the vascular bundle.

[3]

(iv) Measure the length of leaf **J** in **2(a)** and the length of your drawing in **2(a)(iii)**.

length of leaf **J** .....

length of your drawing..... [1]

Indicate on your drawing where you have taken the measurement.

Calculate the magnification of your drawing.

..... [2]

(b) (i) Leaf **K** is more dark green and shiny on the upper surface than on the lower surface.

Explain why leaf **K** is darker green and shinier on its upper surface than on the lower surface.

.....

.....

.....

.....

..... [3]

(ii) When leaf **K** is completely immersed in warm water more bubbles appear on the lower surface of the leaf than the upper surface.

Explain this observation.

.....

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..... [2]

[Total: 18]

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