EXAMINATIONS COUNCIL OF ESWATINI
Eswatini General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

BIOLOGY **6884/03**

Paper 3 Practical Test **October/November 2023**

1 hour 15 minutes

Candidates answer on the Question Paper.

Additional Materials: As listed in Confidential Instructions.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name in the spaces provided.
Write your answers 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 **7** printed pages and **1** blank page.

1 Plants containing chlorophyll manufacture the carbohydrate during photosynthesis. Starch is a carbohydrate.

carbon dioxide + water $\xrightarrow{\text{chlorophyll}}$ carbohydrate + oxygen

The starch was removed from leaves of different green plants, **A** and **B**, by destarching them.

The leaves were then exposed to light for 6 hours as part of an investigation into whether light is necessary for photosynthesis.

You are provided with the two destarched leaves from plants **A** and **B**.

(a) Describe and explain what you would have done to destarch the leaves.

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.....

.....

..... [3]

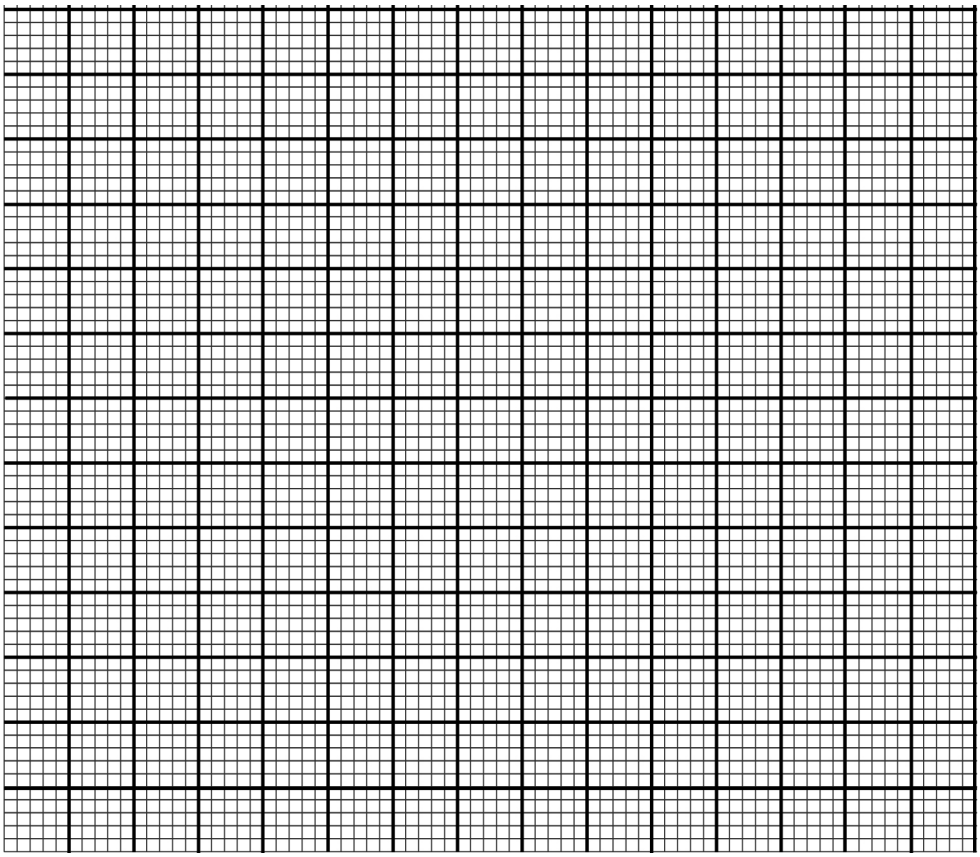
(b) Carefully study the leaves using a hand lens.

Complete the table by describing **two visible** differences between leaf **A** and leaf **B**.

leaf **A**	leaf **B**

[2]

(c) (i) Place leaf **A** on the grid provided and, while holding it in place, carefully draw round its edge.



[1]

(ii) Explain how you would use the outline you have drawn to calculate the surface area of the whole of this leaf **A**.

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.....

.....

..... [3]

Note: For this question you will need hot water. Raise your hand to draw the attention of your Supervisor. Handle the beaker of hot water carefully.

(d) Using forceps, hold leaf **A** in the hot water. Immediately observe both surfaces of the leaf. Then use forceps to remove the leaf from the hot water and place it on a white tile. Describe and explain what you observed when the leaf was placed in the hot water.

.....

.....

.....

.....

..... [4]

[Turn over

(e) You have been provided with some glassware and solutions.

The leaf you dipped in hot water had been destarched then left in the light.

(i) Describe a test you can do using only the materials that have been provided to discover whether the leaf **A** has photosynthesised while being in the light.

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.....

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.....

.....

..... [4]

(ii) Describe how you would ensure that the test you have described was carried out safely.

.....

..... [1]

(iii) Carry out the test you have described and record the result and your conclusion.

result .....

conclusion .....

..... [2]

[Total: 20]

2 A student wished to examine the internal structure of a mammalian kidney. She cut the kidney in half along its length.

Fig. 2.1 is a photograph of the cut surface of the kidney she studied.

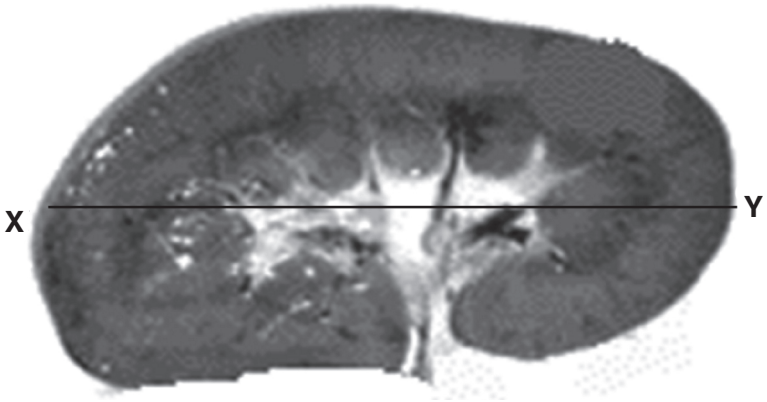

Fig. 2.1

(a) (i) In the space below, make a drawing of the kidney as it appears in Fig. 2.1.

[4]

(ii) On **your drawing**, use label lines to identify the medulla (**M**) and the first part of the ureter (**U**). [2]

[Turn over

(b) (i) On the photograph in Fig. 2.1, identify the line labelled **X–Y**.

Measure and record the length of this line.

length of line **X–Y** ..... mm [1]

(ii) **On your own drawing**, draw a line in the same position as **X–Y**. [1]

(iii) Measure and record the length of the line you have drawn on your drawing.

length of drawing ..... mm [1]

(iv) Use your measurements in **(b)(i)** and **(b)(iii)** to calculate the magnification of your drawing compared to the photograph in Fig. 2.1.

Give your answer to 1 decimal place.

magnification ..... [2]

(c) The student wanted to investigate the effect of placing a piece of kidney and a piece of lung from the same mammal in warm water. She used the following procedure:

cut a piece of kidney 20 × 20 × 20 mm and placed it in boiling tube **C**

cut a piece of lung 20 × 20 × 20 mm and placed it in boiling tube **D**

pour 15 cm^3 of water at 40 °C into each boiling tube

leave both boiling tubes for 10 minutes.

The boiling tubes after 10 minutes are shown in Fig. 2.2.

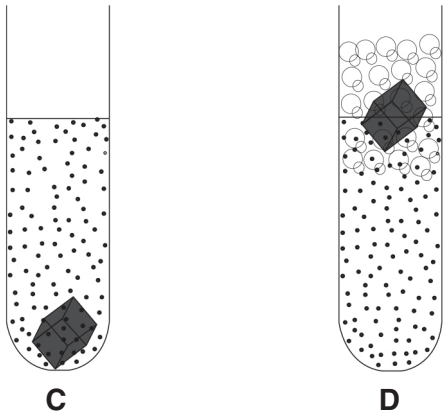

Fig. 2.2

(i) Describe **one** observable difference between boiling tubes **C** and **D** in Fig. 2.2 apart from bubbles and suggest an explanation for what has caused the difference.

difference .....

.....

explanation .....

..... [2]

(ii) State the variables that were controlled in this investigation into the effect of placing pieces of kidney and lung in warm water.

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.....

..... [4]

(iii) State why it is important to control variables in a scientific investigation.

..... [1]

(iv) The student extended the investigation to determine which gas was present in the bubbles seen in Fig. 2.2. She collected samples of the gas to test them.

Describe how you would carry out tests to determine if the gas responsible for the bubbles was carbon dioxide or oxygen. State the positive results for each gas.

gas	test	positive result
carbon dioxide		
oxygen		

[2]

[Total: 20]

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