EXAMINATIONS COUNCIL OF SWAZILAND
Swaziland General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

BIOLOGY **6884/04**

Paper 4 Alternative to Practical **October/November 2018**

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 all the work you hand in.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
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 **8** printed pages and **4** blank pages.

1 **(a)** The enzyme phenolase causes the flesh of apples to turn brown when exposed to air.

An investigation is carried out to find out conditions that promote browning on the cut surface of apples.

An apple is cut into three equal pieces. Two of the pieces are placed in beakers of water **A** and **B** at two different temperatures as shown in Fig. 1.1.

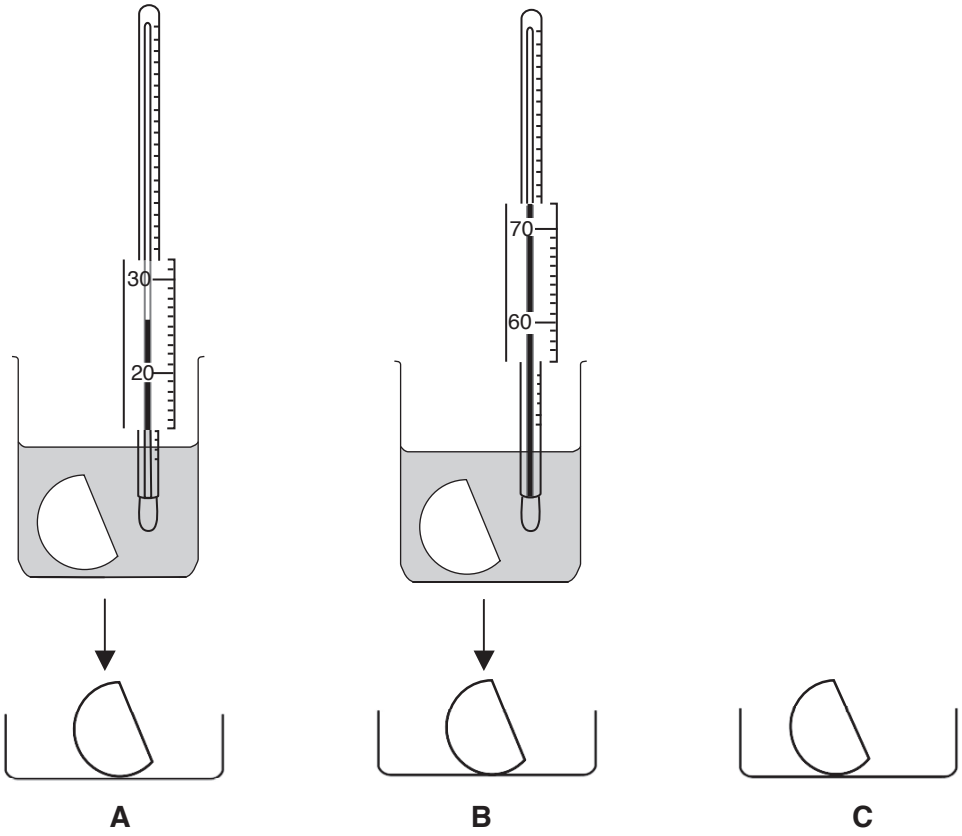


Fig. 1.1

(i) Read and record the temperature of the water in the beakers labelled **A** and **B**.

temperature of water in **A** .....

temperature of water in **B** ..... [1]

(ii) The pieces of apple are removed from the beakers after 30 seconds and placed in corresponding petri dishes labelled **A** and **B**.

The third piece of apple is placed directly into a third petri dish labelled **C**.

After ten minutes it is observed that **A** has turned brown, **B** has not changed colour and **C** has turned brown.

Draw a suitable table to record the observations in the space provided below.

[3]

(iii) State a reason for leaving the investigation for 10 minutes before the observation is recorded.

.....

..... [1]

(iv) Explain the effect of dipping the apple into hot water.

.....

.....

..... [2]

(v) Explain the purpose of including the apple piece **C** in this investigation.

.....

.....

..... [2]

(vi) The reaction that causes browning in apples occurs when the pH is between 5 and 7.

A piece of apple is placed in a solution of vinegar and it does not change colour.

Suggest and explain why there is no browning in the piece of apple.

.....

.....

..... [2]

[Turn over

(vii) Describe how you can modify the investigation to compare the rate of browning in different fruits.

.....

.....

.....

.....

.....

.....

..... [4]

(b) A piece of apple is cut into two equal cubes of 1 cm^3.

One cube is placed into a test-tube labelled **E** containing Benedict's solution.

The other cube is chopped into small pieces and placed into a test-tube labelled **F** which also contains Benedict's solution.

Test-tubes **E** and **F** are placed in a hot water bath at the same time. The solution in test-tube **E** turned brick red after 43 seconds.

The solution in test-tube **F** turned brick red after 76 seconds.

(i) State the importance of using a water bath to heat the test-tubes. [1]

(ii) Explain the effects, on the rate of reaction, of chopping the cube in test-tube **F**.

.....

.....

.....

..... [4]

[Total: 20]

2 **(a)** A cucumber is cut into two equal slices **G** and **H**. The cut surfaces of the two slices are blot-dried first and salt is then sprinkled on the cut surface of slice **G**.

The slices **G** and **H** are left for 10 minutes.

After 10 minutes the salt has dissolved on the surface of slice **G** and the slice is seen to be covered with a lot of water and slice **H** has no water.

(i) Suggest the reason for blot-drying the cut surfaces of the cucumber.

.....

..... [2]

(ii) Explain the effect of putting salt on the cucumber.

.....

.....

.....

.....

.....

..... [4]

(iii) Suggest and explain what will happen to the size of slice **G** if it is left for a long time with the salt.

.....

..... [1]

(iv) State **two** ways in which the reliability of the investigation can be improved.

1 .....

2 ..... [2]

(b) Fig. 2.1 shows a cross section of a cucumber.

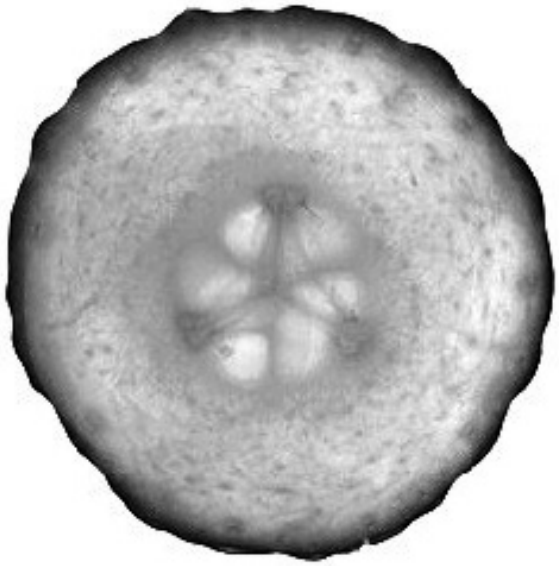


Fig. 2.1

(i) Draw a diagram of the cross section of the cucumber in Fig. 2.1.

[2]

(ii) Label on your diagram using a line and name the part which develops from the ovules. [1]

(c) In an investigation, equal sized samples of carrot, celery, cucumber and potato are immersed in distilled water for 20 minutes.

Table 2.1 shows the results.

Table 2.1

	initial length / mm	final length / mm	change in length / mm
cucumber	70	72	2
celery	70	**(i)**	3
potato	70	75	5
carrot	70	71	1

(i) Calculate the final length for the celery.

..... [1]

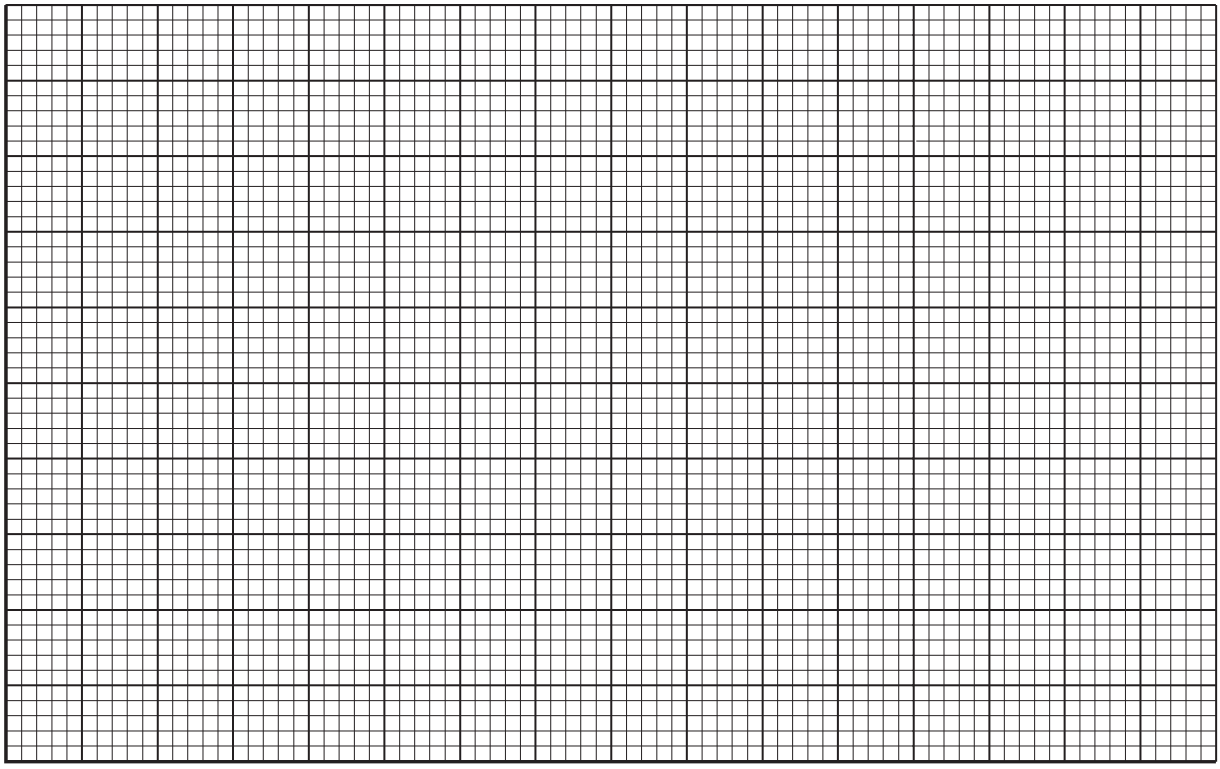
(ii) Explain why the change is greatest in the potato.

.....

.....

..... [2]

(iii) Plot on the grid, a bar chart of the change in length for each sample in Table 2.1.



[4]

(iv) Predict the final length of the cucumber sample if it is boiled in water before the experiment.

..... [1]

[Total: 20]

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