Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

BIOLOGY **0610/61**

Paper 6 Alternative to Practical **October/November 2014**

1 hour

Candidates answer on the Question Paper.

No Additional Materials are required.

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 IN ANY BARCODES.

Answer **all** questions.

Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **10** printed pages and **2** blank pages.

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1 Yeast, *Saccharomyces cerevisiae*, is used in bread-making.

Some students mixed flour, sugar and a yeast suspension to make bread dough and investigate the rate at which the dough rises.

- 25 g of wheat flour and 1 g of sugar were weighed and placed in a beaker.
- 25 cm^3 of yeast suspension was added to the flour and sugar.
- The mixture was stirred with a glass rod until it formed a smooth paste. This was the bread dough.
- The narrow opening of three clean 20 cm^3 syringes was sealed as shown in Fig.1.1.
- 5 cm^3 of the dough was poured into each of the syringes.
- The syringes were placed vertically in a test-tube rack, as shown in Fig. 1.1.

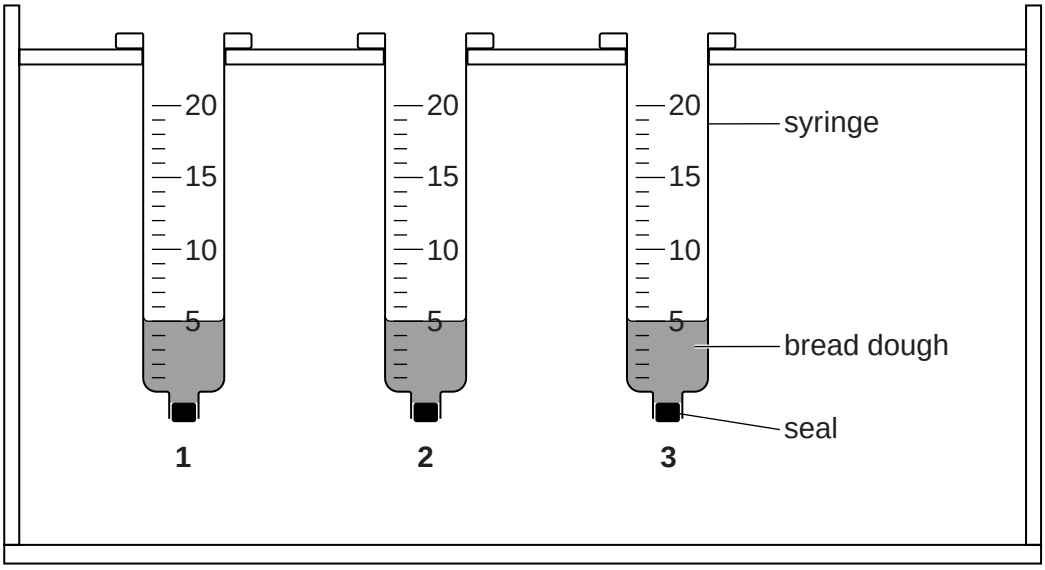


Fig. 1.1

- After 5 minutes, the volume of the dough in each syringe was measured and recorded.
- The volume of the dough in each syringe was then measured and recorded every 5 minutes for a total of 20 minutes.

Fig. 1.2. shows the appearance of the three syringes after 5, 10, 15 and 20 minutes.

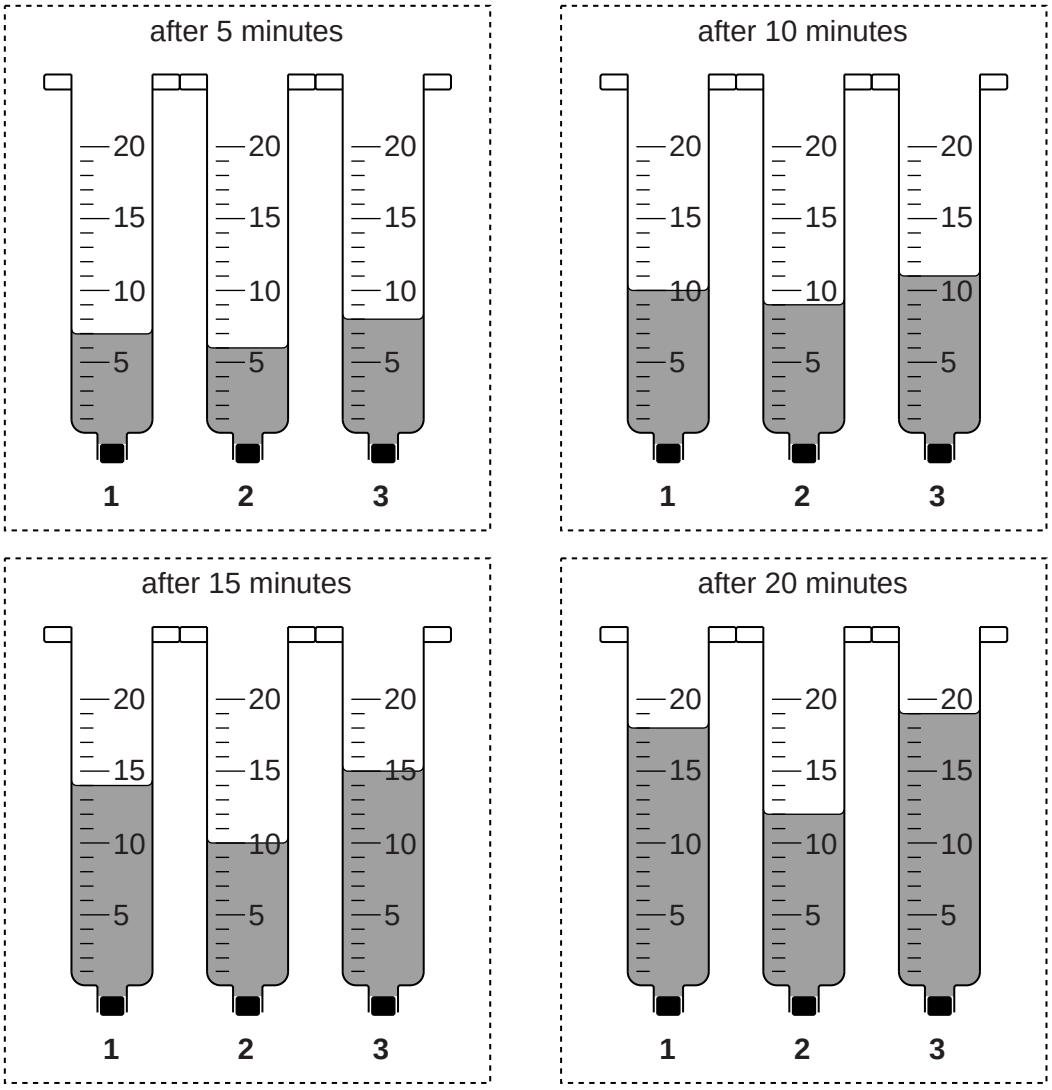


Fig. 1.2

(a) Prepare a table to record the results of the investigation shown in Fig. 1.1 and Fig. 1.2.

Read the volume of the dough in each syringe and record it in your table.

[6]

(b) (i) Give a reason why **three** syringes were used.

.....

.....[1]

(ii) Identify the syringe in which the results may be anomalous and explain your choice.

.....

.....[1]

(iii) Calculate the average volume of the bread dough in the three syringes after 20 minutes.

Show your working.

Give your answer to the nearest whole number.

.....cm^3 [1]

(c) Some students used the same method described in part **(a)** to investigate the effect of temperature on the volume of bread dough.

They used three 50 cm^3 syringes at each of seven temperatures.

The starting volume in each syringe was 5 cm^3.

Their results are recorded in Table 1.1.

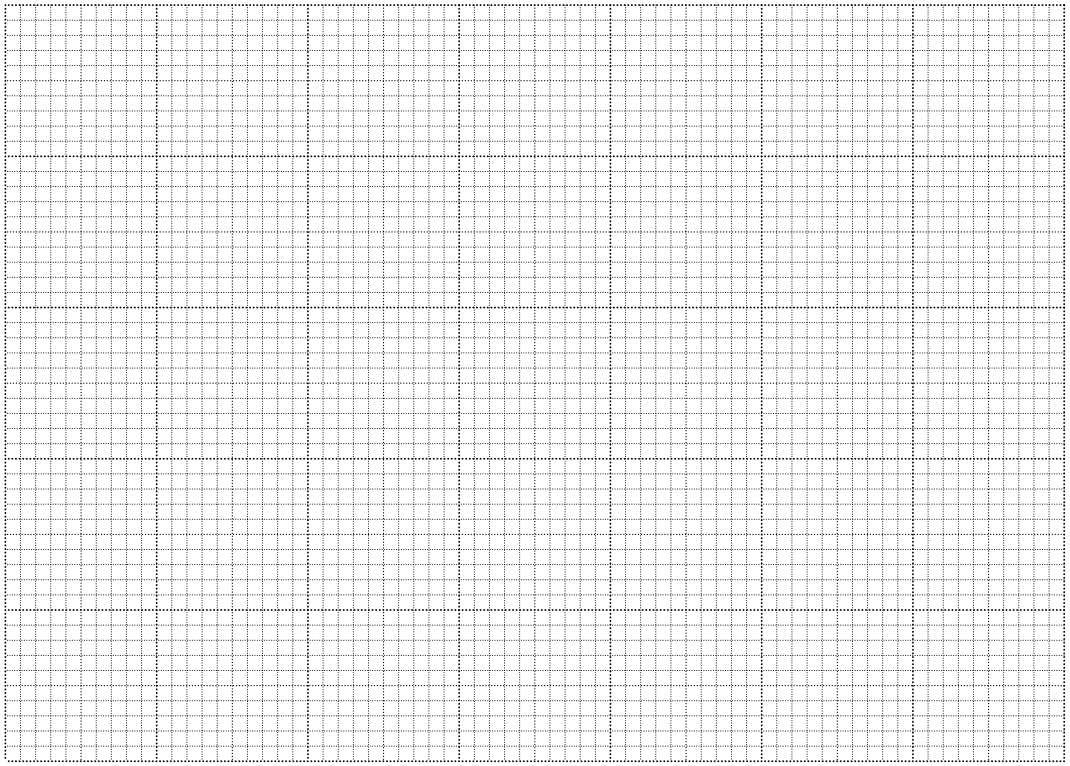
Table 1.1

temperature / °C	average volume of bread dough after 20 minutes / cm^3	average increase in volume / cm^3
10	6	1
20	10	5
30	20	15
40	35	.....
50	47	42
60	30	25
70	7	2

(i) Calculate the average increase in volume at 40 °C.

Write your answer in the space in Table 1.1. [1]

(ii) Use the data in Table 1.1 to plot a graph of the average increase in volume of bread dough against temperature.



[4]

(iii) Describe the results shown by the graph.

.....

.....

.....

.....[2]

(iv) Suggest what the students could conclude from this investigation about the effect of temperature on the activity of yeast.

.....

.....[1]

[Total: 17]

2 Fig. 2.1 shows two leaves, **R** and **S**, from different plants.

R **S**

actual size

Fig. 2.1

(a) (i) Make a large drawing of **R** to show:

- the shape of the leaf
- the arrangement of the veins in the leaf.

Label the main vein (midrib).

[4]

(ii) Draw a line across the widest part of **R** in Fig. 2.1. Measure, in millimetres, the distance and record your result. Include your units.

distance across the widest part of **R** .....

Draw a line across the widest part of your drawing, measure the distance (in millimetres) and record your result. Include your units.

distance across widest part of drawing of **R**.....[3]

(iii) Calculate the magnification of your drawing.

Show your working.

Give your answer to the nearest whole number.

magnification × .....[2]

(b) (i) Complete Table 2.1 by recording two **visible** differences, other than colour, between leaves **R** and **S**.

Table 2.1

R	S
1.....	....
2.....	....

[2]

(ii) State, with a reason, which of the leaves, **R** or **S**, is from a monocotyledon.

.....

.....[1]

(c) Some students were provided with two leaves, **V** and **W**, from different plants. In an investigation into water loss, the students recorded the mass of each of these leaves every 5 minutes for 60 minutes.

(i) The humidity did not change during the investigation.

State **two** other variables that should be kept constant during the investigation.

Describe how each variable could be kept constant.

1. variable .....

method of keeping constant .....

.....

2. variable .....

method of keeping constant .....

.....[4]

The results are shown in Table 2.2.

Table 2.2

time / min	mass of **V** / g	mass of **W** / g
0	5.2	7.5
5	4.8	7.2
10	4.0	6.5
15	5.5	6.0
20	3.2	5.5
25	2.9	5.1
30	2.8	4.3
35	2.7	4.0
40	2.4	3.6
45	2.2	3.2
50	1.8	3.0
55	1.8	2.9
60	1.8	2.7

(ii) The students assumed that the change in mass was due to water loss.

Describe how the students could show that **water** is lost from the leaves.

.....

.....

.....

.....

.....

.....[3]

(iii) Describe **two** similarities and **two** differences in the pattern of water loss of leaf **V** and leaf **W**.

similarities

1 .....

.....

2 .....

.....

differences

1 .....

.....

2 .....

.....[4]

[Total: 23]

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