Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

6336218590

BIOLOGY **0610/62**

Paper 6 Alternative to Practical **May/June 2016**

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 **12** printed pages.

DC (ST/JG) 112140/3

CAMBRIDGE International Examinations

[Turn over

1 Some students test the composition of three liquid food supplements.

(a) **(i)** State the chemical test the students would use to show that protein is present in a liquid sample of a food supplement.

....[1]

The students carried out this test for protein on liquid samples of food supplements **P**, **Q** and **R**.

Food supplements **P** and **R** contained protein.

(ii) Complete Table 1.1 to show the results from the students' tests for protein.

Table 1.1

food supplement	colour at start	colour at end
P		
Q		
R		

[2]

The students carried out a test for vitamin C on liquid samples of food supplements **P**, **Q** and **R**.

When iodine solution is mixed with starch, a blue-black colour is observed. Vitamin C stops this blue-black colour from forming.

Step 1 The students labelled a test-tube **P** and added 3 cm^3 of food supplement **P** to the test-tube.

Step 2 They added 1 cm^3 of starch solution to test-tube **P**.

Step 3 The students added iodine solution to the test-tube, one drop at a time. They counted the drops as they added them. They shook the test-tube gently after adding each drop and stopped adding drops when a blue-black colour remained.

A blue-black colour remained in **P** after **12** drops of iodine solution had been added.

Step 4 They repeated steps **1** to **3** with food supplements **Q** and **R**.

A blue-black colour remained in **Q** after **1** drop of iodine solution had been added.

A blue-black colour remained in **R** after **5** drops of iodine solution had been added.

Table 1.2 shows how the number of drops of iodine solution added relates to the vitamin C content of the food supplement.

Table 1.2

number of drops of iodine solution added	vitamin C content
1	none
2–3	low
4 or more	high

(b) Use the results of the students' experiments and the information in Table 1.2 to complete Table 1.3.

Table 1.3

food supplement	number of drops of iodine solution added	vitamin C content
P		
Q		
R		

[2]

The students carried out a test for reducing sugar on liquid samples of food supplements **P**, **Q** and **R**.

(c) **(i)** Name the solution used for the reducing sugar test.

....[1]

(ii) Give **one** safety precaution that should be used when carrying out this test.

....[1]

A positive result for the test for reducing sugar is the appearance of a brick-red colour.

The quicker the brick-red colour appears, the higher the concentration of reducing sugar.

Step 5 The students labelled a test-tube **P2** and added a sample of food supplement **P** to the test-tube.

Step 6 They added 2 cm^3 of the test solution to test-tube **P2**.

Step 7 The students repeated steps **5** and **6** with food supplements **Q** and **R**.

Step 8 They placed test-tubes **P2**, **Q2** and **R2** into hot water, and started a timer.

Step 9 The students observed the test-tubes carefully and noted the time when the brick-red colour appeared in each test-tube.

If there was no colour change after 180 seconds (3 minutes), the students recorded 'more than 180' as the result for that test-tube.

A brick-red colour appeared in test-tube **R2** after 25 seconds and in test-tube **P2** after 1 minute and 15 seconds.

No brick-red colour appeared in test-tube **Q2**.

(d) Complete Table 1.4 to show the students' results for the reducing sugar test.

Table 1.4

test-tube	time for brick-red colour to appear / s

[2]

(e) There is a source of error in step **5** of the method for the reducing sugar test.

(i) Identify this source of error.

....

....

....[1]

(ii) Suggest apparatus that could be used to minimise this source of error.

....[1]

(f) State **one** other source of error in the method used for the reducing sugar test.

Suggest how to improve the method to minimise this source of error.

error

....

....

improvement

....

....

....

[2]

(g) Table 1.5 shows the protein content of five foods.

Table 1.5

food	protein content of food / g per 100 g
maize	3.2
rice	7.1
potato	2.0
yam	1.5
sorghum	11.3

(i) Plot a graph of the data shown in Table 1.5.

[4]

(ii) It is recommended that a six-year-old child eats 20 g of protein per day.

Calculate the mass of sorghum a six-year-old child must eat each day to obtain 20 g of protein.

Show your working.

Give your answer to the nearest whole number.

.... g

[2]

[Total: 19]

2 Fig. 2.1 shows the apparatus used to measure the rate of water loss from the leaves of a plant.

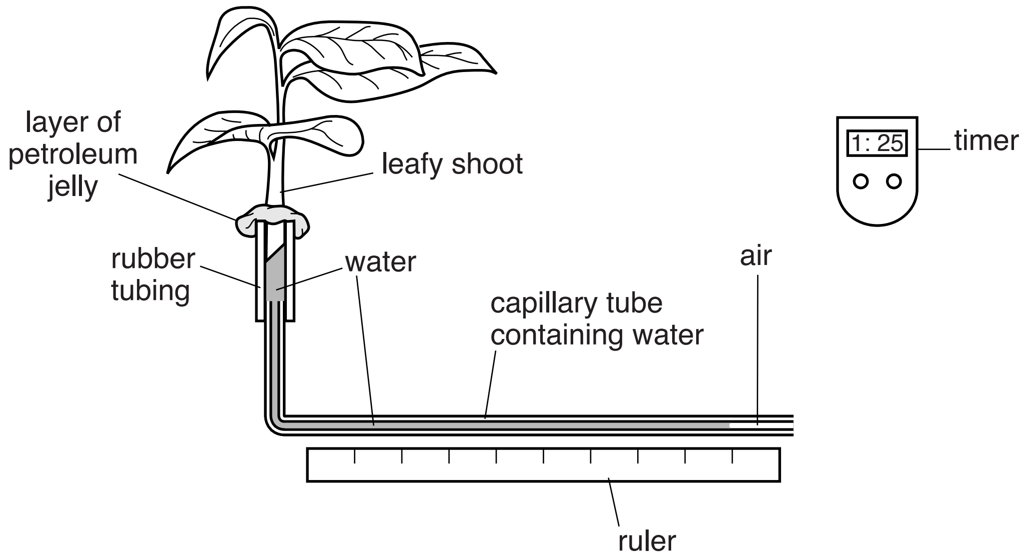

Fig. 2.1

(a) Suggest how a student might use the apparatus shown in Fig. 2.1 to calculate the **rate** of water loss from the leaves of a leafy shoot.

....

....

....

....

....[2]

The student used the apparatus shown in Fig. 2.1 to compare the rates of water loss from leaves in still and moving air.

(b) Suggest **one** piece of apparatus that the student could use to vary the air movement.

....[1]

(c) State **two** variables that the students should keep constant in this investigation.

1 ....

....

2 ....

....
[2]

Petroleum jelly is greasy and waterproof.

(d) Suggest the purpose of the petroleum jelly on the apparatus shown in Fig. 2.1.

....

....[1]

The student's results are shown in Fig. 2.2.

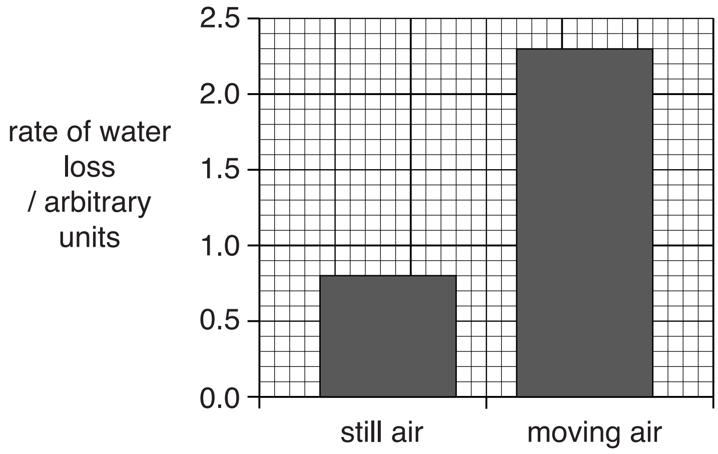

Fig. 2.2

(e) The rate of water loss is greater in moving air than still air.

Use Fig. 2.2 to calculate how many times greater the rate of water loss is in moving air.

Show your working.

Give your answer to the nearest whole number.

....

[2]

(f) Another student thinks that the apparatus in Fig. 2.1 does not measure water **loss** from the leaves.

Suggest why this student is correct.

....

....

....[1]

(g) Fig. 2.3 shows some laboratory apparatus.

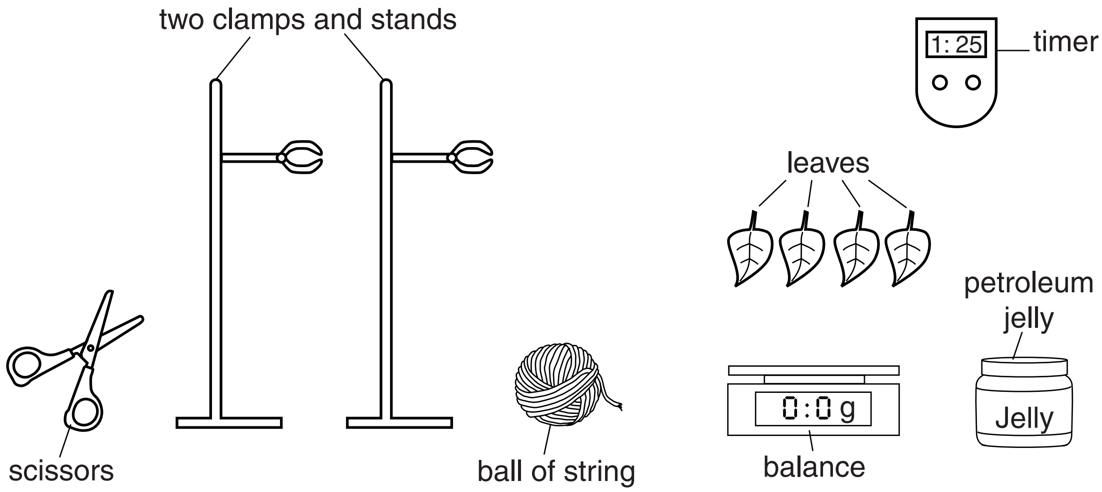

Fig. 2.3

Petroleum jelly is greasy and waterproof.

Describe, with the aid of a labelled diagram, how you could set up the apparatus shown in Fig. 2.3 to find out whether the upper or the lower surface of the leaves loses more water by evaporation.

....

....

....

....

....

....

....

....

....[6]

(h) Fig. 2.4 shows a section of a stem as seen under a light microscope.

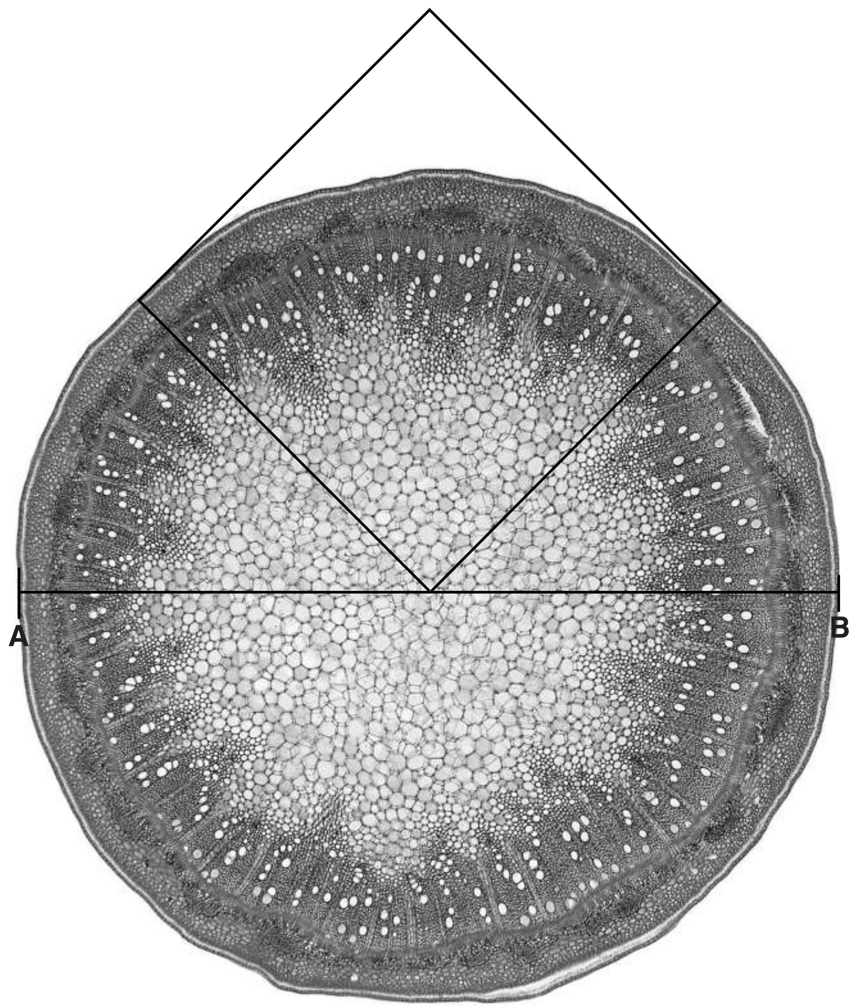

Fig. 2.4

Make a large drawing of the section of the stem contained in the square on Fig. 2.4 to show the different structures and layers.

Do not draw any individual cells.

[4]

(i) **(i)** The diameter of the stem in Fig. 2.4 is shown by the line **AB**.

Measure the length of **AB** on Fig. 2.4.

measured length of line **AB** .... mm [1]

(ii) The actual diameter of the stem is 7.5 mm.

The magnification of Fig. 2.4 can be calculated using the following equation:

$$\text{magnification} = \frac{\text{length of } \mathbf{AB}}{\text{actual diameter of stem}}$$

Calculate the magnification of Fig. 2.4 using the information above and your answer to **(i)**.

Show your working.

Give your answer to the nearest whole number.

magnification .... [1]

[Total: 21]