Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

0409259109

BIOLOGY **0610/52**

Paper 5 Practical Test **May/June 2016**

1 hour 15 minutes

Candidates answer on the Question Paper.

Additional Materials: As listed in the Confidential Instructions.

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.

For Examiner's Use	
1	
2	
Total	

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.

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Read through all the questions on this paper carefully before starting work.

1 You are going to test the composition of three liquid food supplements: **P**, **Q** and **R**.

Use the eye protection provided.

Read through steps 1 to 5 before starting the experiment.

(a) You will test the three food supplements, **P**, **Q** and **R**, for vitamin C.

Only **two** of the food supplements contain a high amount of vitamin C.

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

Step 1 Label a test-tube **P** and add 3 cm^3 of food supplement **P** to the test-tube.

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

Step 3 Add iodine solution to test-tube **P**, one drop at a time. Count the drops as you add them. Gently shake the test-tube from side to side after adding each drop. Stop adding drops when a blue-black colour remains **or** when you have added 20 drops of iodine solution.

Step 4 Record the number of drops added in Table 1.2.

Step 5 Repeat steps **1** to **4** with food supplements **Q** and **R**.

Table 1.1 shows how the number of drops of iodine solution added relates to the vitamin C content of the food supplement.

Table 1.1

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

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(i) Use your results and the information in Table 1.1 to complete Table 1.2.

Table 1.2

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

[2]

(ii) There is a source of error in step **3** of the method for the vitamin C test.

Identify this source of error **and** suggest why it is a source of error in the experiment.

.....

.....

.....

..... [2]

(b) (i) You will now test the food supplements, **P**, **Q** and **R**, to find their reducing sugar content.

A positive result for the test for reducing sugar is a colour change from blue.

The quicker the colour changes, the higher the concentration of reducing sugar.

Read through steps 6 to 11 before starting the experiment.

Step 6 Label a test-tube **P2** and add 3 cm^3 of food supplement **P** to the test-tube.

Step 7 Add 3 cm^3 of the reducing sugar test solution to test-tube **P2**.

Step 8 Repeat steps 6 and 7 with food supplements **Q** and **R**.

Step 9 Raise your hand to request a beaker of hot water.

Step 10 Place test-tubes **P2**, **Q2** and **R2** into the beaker of hot water, and **immediately** start the timer.

Step 11 Observe the test-tubes and in Table 1.3 record the time as soon as the colour changes from blue.

If there is no colour change after 180 seconds (3 minutes), stop timing and record ‘more than 180’ as the result for that test-tube.

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Table 1.3

test-tube	time for colour change / s

[3]

(ii) Name the solution used to test for reducing sugars.

..... [1]

(c) State **one** 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]

(d) Some students carried out the test for protein on food supplements **P**, **Q** and **R**.

(i) State the chemical test you would use to show that protein is present.

..... [1]

(ii) Food supplements **P** and **R** contain protein. Food supplement **Q** does not contain protein.

Complete Table 1.4 to show the results from the students' tests for protein.

Table 1.4

food supplement	colour at start	colour at end
P		
Q		
R		

[2]

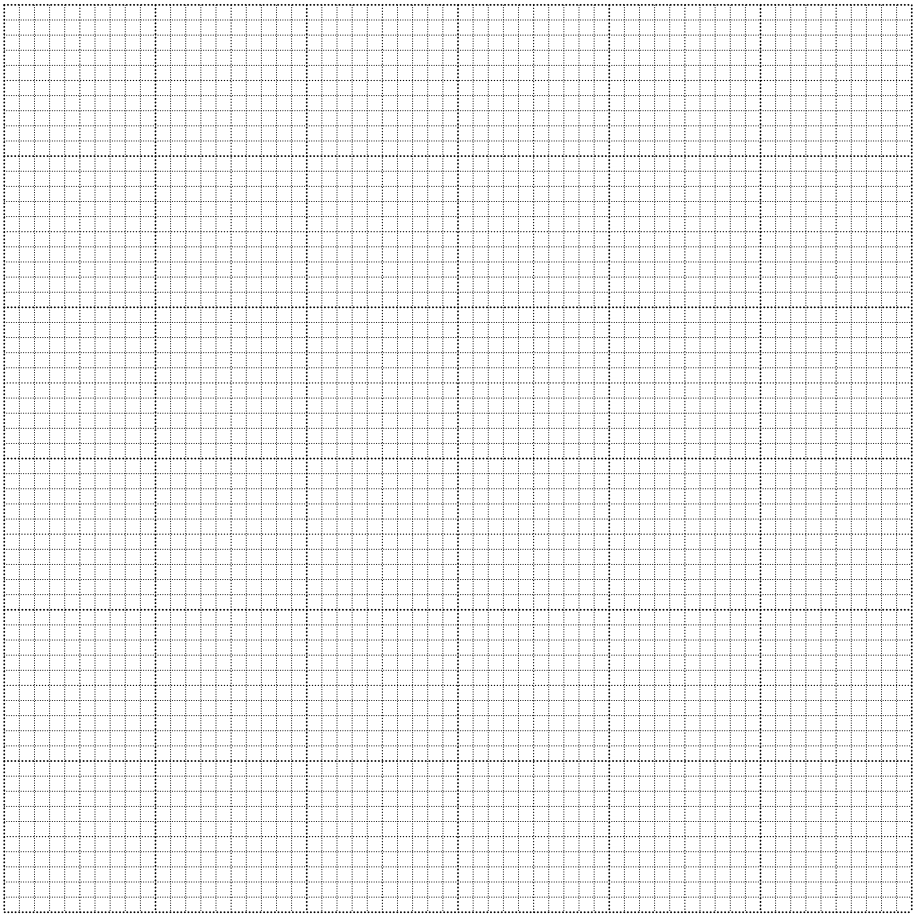
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(e) Table 1.5 shows the protein content of five foods.

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]

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

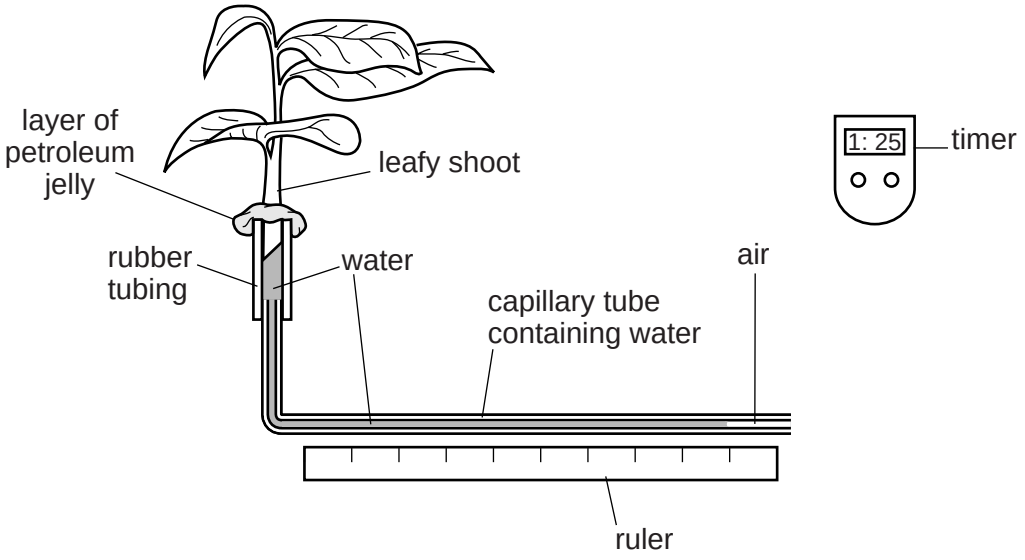


Fig. 2.1

(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 student 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.

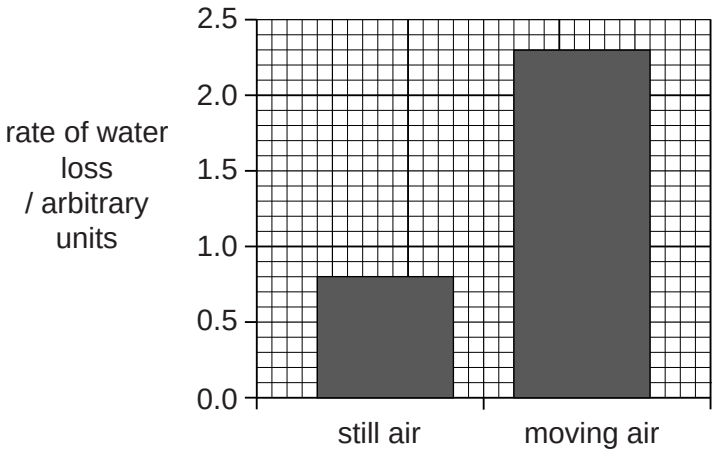


Fig. 2.2

(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 than still air.

Show your working.

Give your answer to one decimal place.

.....

[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]

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(g) Fig. 2.3 shows some laboratory apparatus.

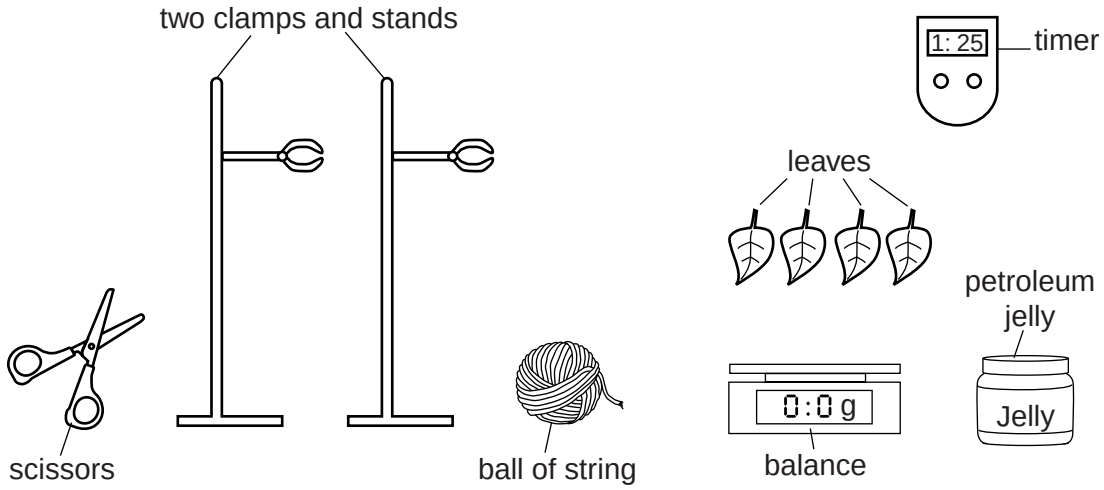


Fig. 2.3

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.

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..... [6]

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

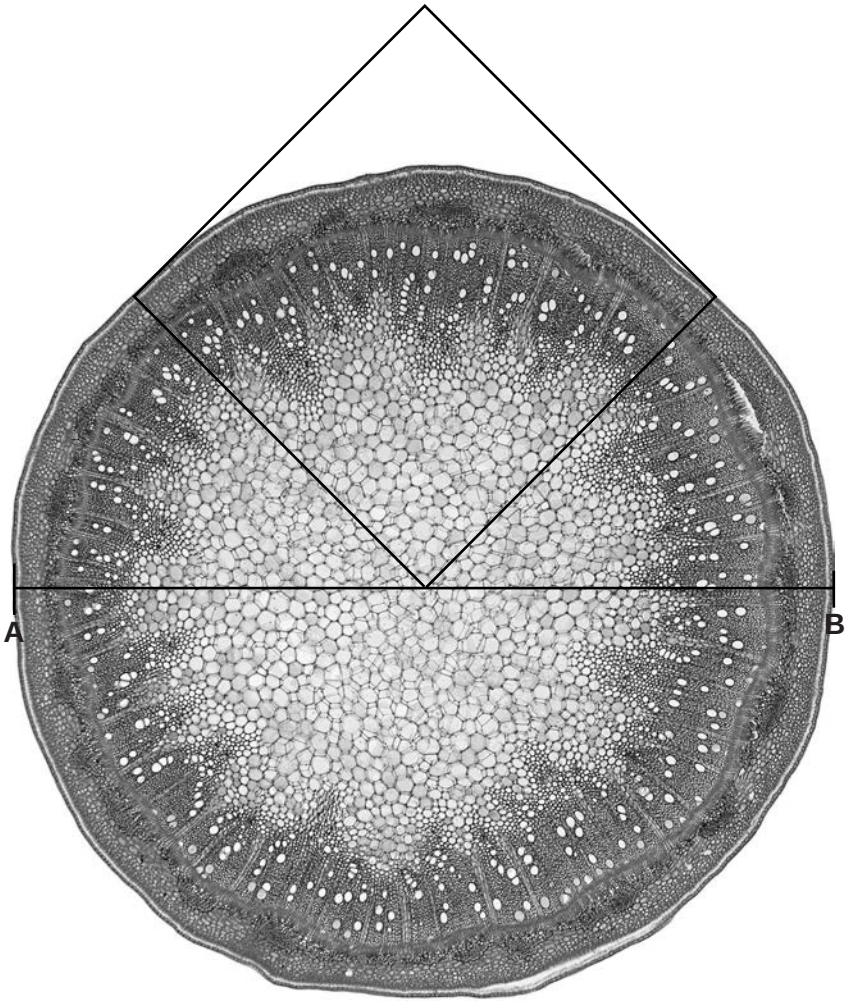


Fig. 2.4

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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]

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