Your Science Online

Cambridge IGCSE Biology 0610 style

TRANSPORT IN PLANTS

Topic practice paper (exam style)

CANDIDATE NAME	
CLASS	
DATE	

50 minutes

You will need: a pen, a pencil, a ruler and a calculator.

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes or in the margins.
- You may use a calculator.
- You should show all your working and use appropriate units.

INFORMATION

- The total mark for this paper is 45.
- The number of marks for each question or part question is shown in brackets [ ].
- Questions or parts marked **[Extended]** are for Extended-tier candidates. Core candidates may leave them out (Core total: 32 marks).
- Topics: xylem and phloem, root hair cells, the pathway of water, transpiration, potometers, wilting and translocation.

For teacher's use	
Question	**Mark**
1	
2	
3	
4	
5	
Total	

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1 Fig. 1.1 shows a transverse section through the stem of a flowering plant.

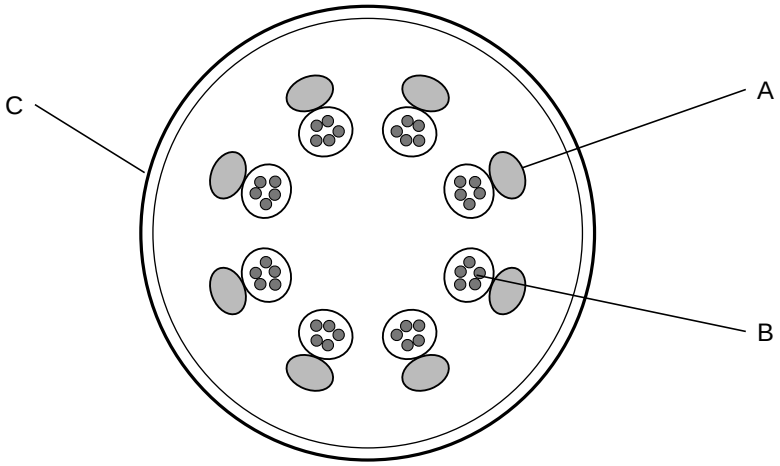

Fig. 1.1

(a) Name the tissues labelled **A** and **B**.

A ..... B .....

[2]

(b) State **one** function of tissue **B**.

..... [1]

(c) Name **two** substances transported by tissue **A**.

1 ..... 2 .....

[2]

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(d) Fig. 1.2 shows a root hair cell.

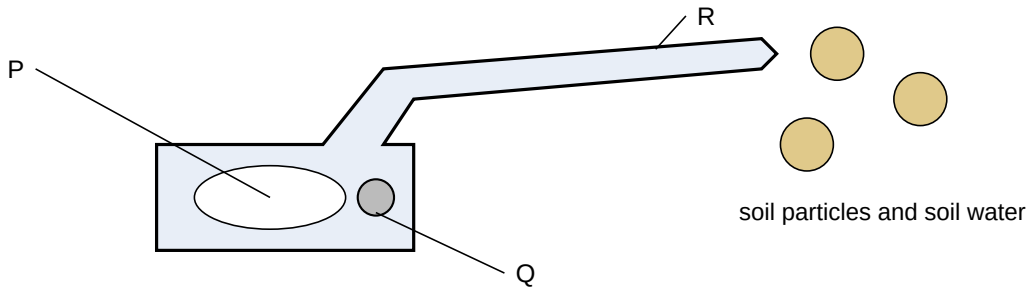

Fig. 1.2

(i) Name the part labelled **Q**.

..... [1]

(ii) Water enters the root hair cell from the soil. Explain how.

.....

..... [2]

[Extended] (iii) Explain how the shape of part **R** helps the cell to absorb water.

..... [1]

2 A student puts a celery stalk with leaves into a beaker of water containing a red dye. After 24 hours, the student cuts across the stalk. Fig. 2.1 shows the cut surface.

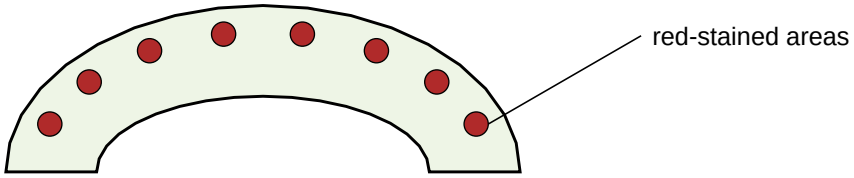

Fig. 2.1

(a) Name the tissue that has been stained red.

..... [1]

(b) The dye reaches the leaves. The student sees red lines in the leaves. Name these red lines.

..... [1]

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(c) Water travels from the soil to the leaves. Put these cells and tissues in the correct order, starting from the soil.

root cortex cells mesophyll cells root hair cells xylem

soil > ..... > ..... > ..... > .....

[2]

(d) The student repeats the experiment beside an open window on a warm, windy day. Predict how this changes the time taken for the dye to reach the leaves. Give a reason.

.....

..... [2]

(e) State **two** variables the student should keep the same when comparing the two experiments.

1

.....

2

..... [2]

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3 This question is about transpiration.

(a) Define the term *transpiration*.

.....

..... [2]

(b) Fig. 3.1 shows a potometer. As the shoot takes up water, the air bubble moves along the capillary tube.

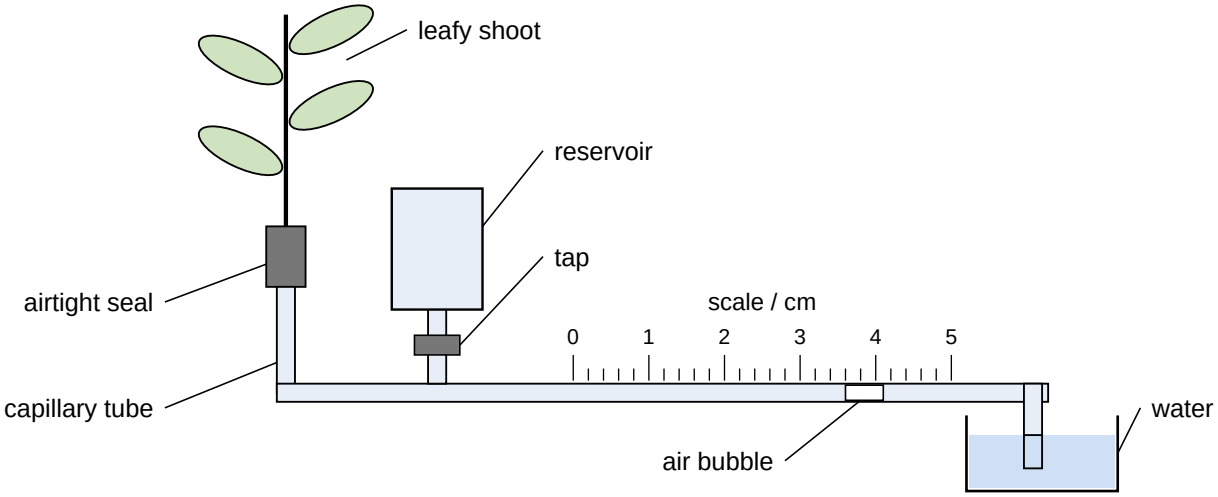

Fig. 3.1

A potometer measures water uptake, not water loss. Suggest why these may not be exactly the same.

..... [1]

A student uses the potometer at different temperatures. Table 3.1 shows the distance the bubble moves in 5 minutes.

temperature / °C	10	15	20	25	30	35
distance in 5 min / mm	10	14	19	25	30	33
rate / mm per min	2.0	2.8	3.8		6.0	6.6

Table 3.1

(c) Calculate the rate at 25 °C. Write your answer in Table 3.1.

[1]

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(d) On the grid in Fig. 3.2, plot the rates from Table 3.1 against temperature. Draw a smooth curve of best fit.

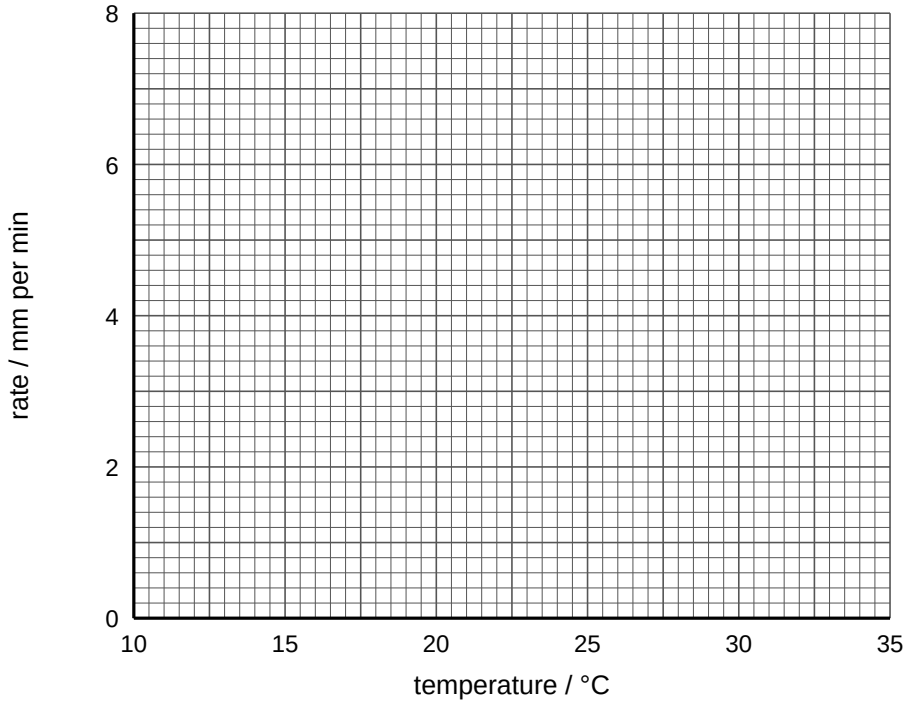

Fig. 3.2

[3]

(e) Describe the effect of temperature on the rate of water uptake shown by your graph.

.....

..... [2]

(f) ***[Extended]*** Explain why the rate of transpiration increases as the temperature increases.

.....

.....

..... [2]

(g) State **one** precaution the student should take when setting up the potometer, so that the results are valid.

..... [1]

(h) Suggest how the student can move the bubble back to the start of the scale between readings.

..... [1]

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4 Fig. 4.1 shows a section through part of a leaf.

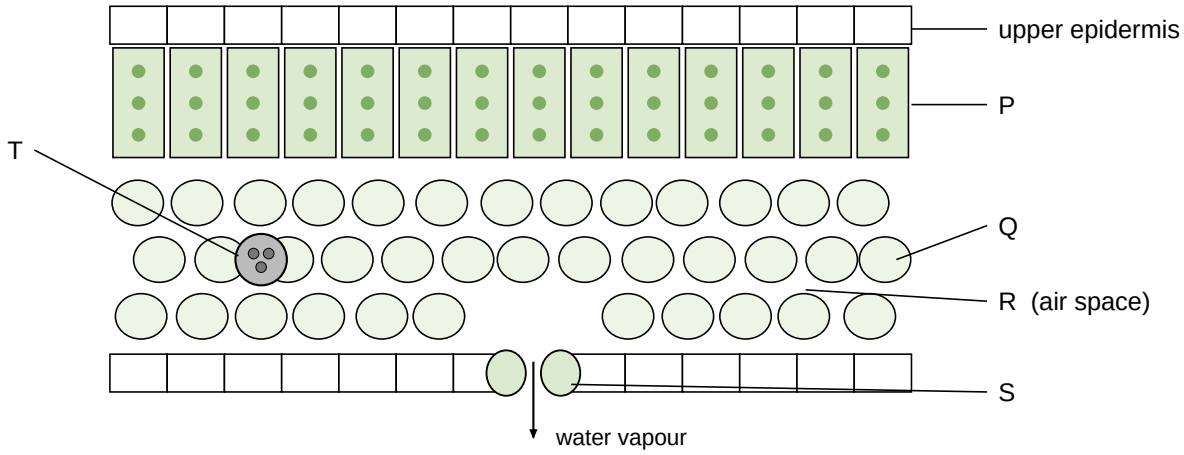

Fig. 4.1

(a) Use letters from Fig. 4.1 to identify:

(i) a stoma (the pore between two guard cells) .....

(ii) the tissue that brings water into the leaf .....

[2]

(b) Describe how water leaves the leaf. Use the words **evaporates**, **air spaces** and **diffuses** in your answer.

.....

.....

..... [3]

(c) ***[Extended]*** Explain why the rate of transpiration is lower when the air is very humid.

.....

..... [2]

(d) ***[Extended]*** On a hot day a plant loses water faster than it takes it up. Explain why the plant wilts.

..... [1]

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5 ***[Extended]*** This question is about how substances move through a plant.

(a) Define the term *translocation*.

.....

..... [2]

(b) Table 5.1 lists parts of a potato plant. For each part, write **source** or **sink** for sucrose.

part of plant	source or sink
leaf in bright light	
growing root tip	
tuber (storage organ) in summer, filling with starch	
tuber in spring, as new shoots grow	

Table 5.1

[2]

(c) Explain how water moves up the xylem from the roots to the leaves. Use the term **transpiration pull** in your answer.

.....

.....

.....

..... [3]

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END OF PAPER

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