



**OXFORD CAMBRIDGE AND RSA EXAMINATIONS**

**Advanced Subsidiary GCE**

**BIOLOGY**

**2803/01**

**Transport**

Tuesday

**8 JUNE 2004**

Morning

45 minutes

Candidates answer on the question paper.

Additional materials:

Electronic calculator

Ruler (cm/mm)

Candidate Name	Centre Number	Candidate Number										
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**TIME** 45 minutes

**INSTRUCTIONS TO CANDIDATES**

- Write your name in the space above.
- Write your Centre number and Candidate number in the boxes above.
- Answer **all** the questions.
- Write your answers, in blue or black ink, in the spaces provided on the question paper.
- Read each question carefully before starting your answer.

**INFORMATION FOR CANDIDATES**

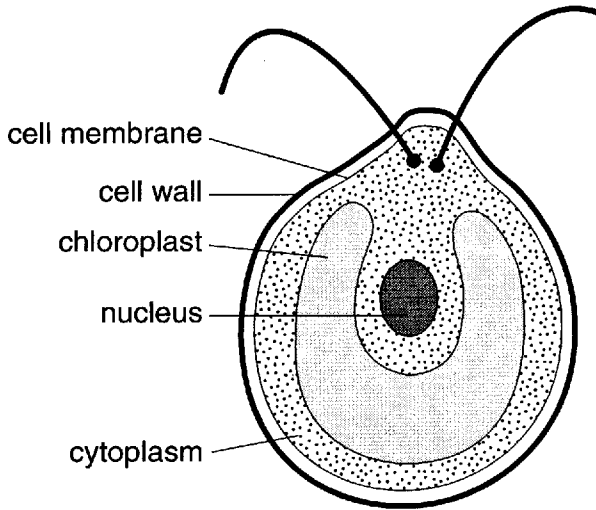
- The number of marks is given in brackets [ ] at the end of each question or part question.
- You will be awarded marks for the quality of written communication where this is indicated in the question.
- You may use an electronic calculator.
- You are advised to show all the steps in any calculations.

<b>FOR EXAMINER'S USE</b>		
Qu.	Max.	Mark
1	7	
2	12	
3	18	
4	8	
<b>TOTAL</b>	<b>45</b>	

**This question paper consists of 11 printed pages and 1 blank page.**

Answer **all** the questions.

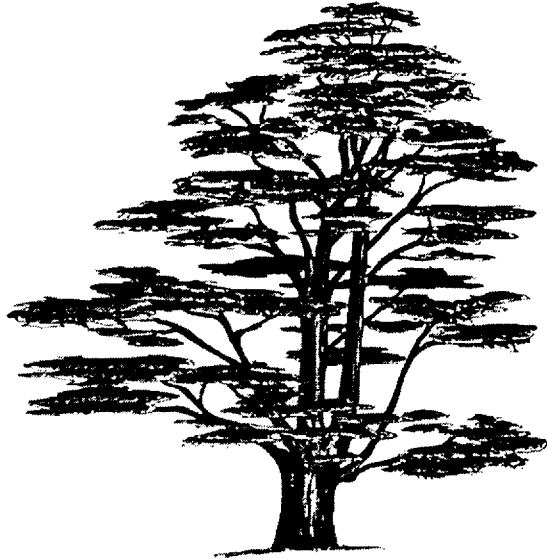
- 1 Fig. 1.1 shows the structure of a single-celled organism called *Chlamydomonas* which shares many features with plant cells. Fig. 1.2 shows a cedar tree. The cells of both organisms need water to carry out their metabolic functions.



5  $\mu$ m

*Chlamydomonas*

**Fig. 1.1**



5 m

cedar tree

**Fig. 1.2**

- (a) (i) *Chlamydomonas* lives in fresh water ponds.

Explain how single-celled organisms like *Chlamydomonas* obtain water from their external environment.

.....  
.....  
.....  
.....[2]

- (ii) Sea water contains a much higher percentage of salts than the fresh water in which *Chlamydomonas* lives.

Suggest the changes that would take place in the *Chlamydomonas* cell if it were transferred to sea water.

.....  
.....  
.....  
.....  
.....[2]

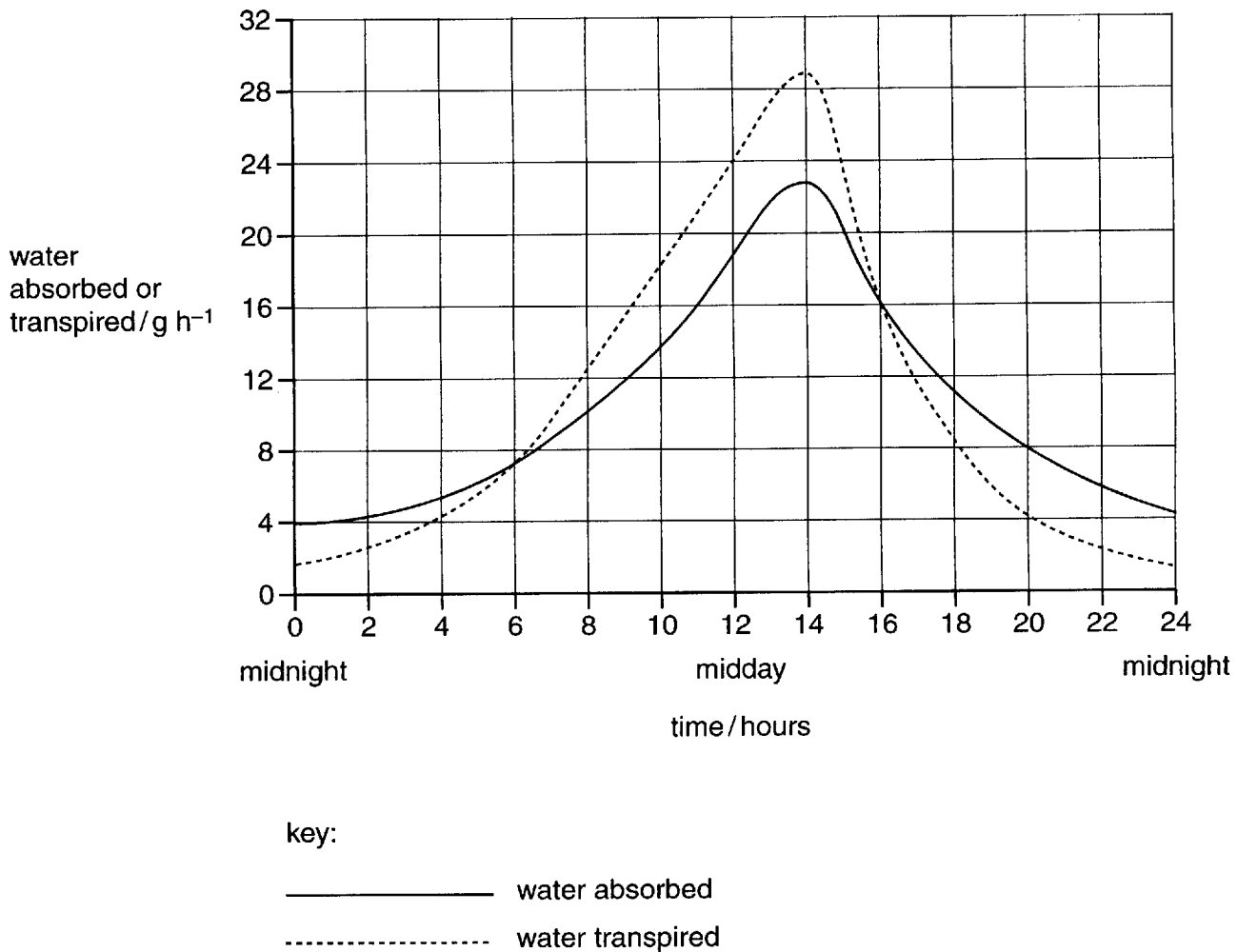
- (b) *Chlamydomonas* has no water transport system whereas the tree shown in Fig. 1.2 has a well developed system for water transport.

Explain why a large multicellular organism like a tree needs a water transport system whilst *Chlamydomonas* does not.

.....  
.....  
.....  
.....[3]

[Total: 7]

- 2 Fig. 2.1 shows the results of an investigation to compare rates of transpiration and water absorption by a plant during a hot day in summer. There was no shortage of soil water available to the plant throughout the investigation, which was carried out over 24 hours starting at midnight.



**Fig. 2.1**

- (a) (i) Define the term *transpiration*.

.....

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.....

..... [2]

- (ii) Using Fig. 2.1, describe how the rate of transpiration varied over the 24 hour period **and** compare it with the rate of water absorption.

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.....  
.....[4]

- (iii) Calculate the percentage of the 24 hour day in which the rate of water absorption exceeds the rate of transpiration.

Show your working and **give your answer to the nearest whole number.**

Answer ..... % [2]

- (b) Explain how transpiration results in the movement of water up a plant stem.

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.....  
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.....  
.....[4]

[Total: 12]

- 3 Fig. 3.1 is a simple diagram of a mammalian heart and associated blood vessels as seen in front (ventral) view.

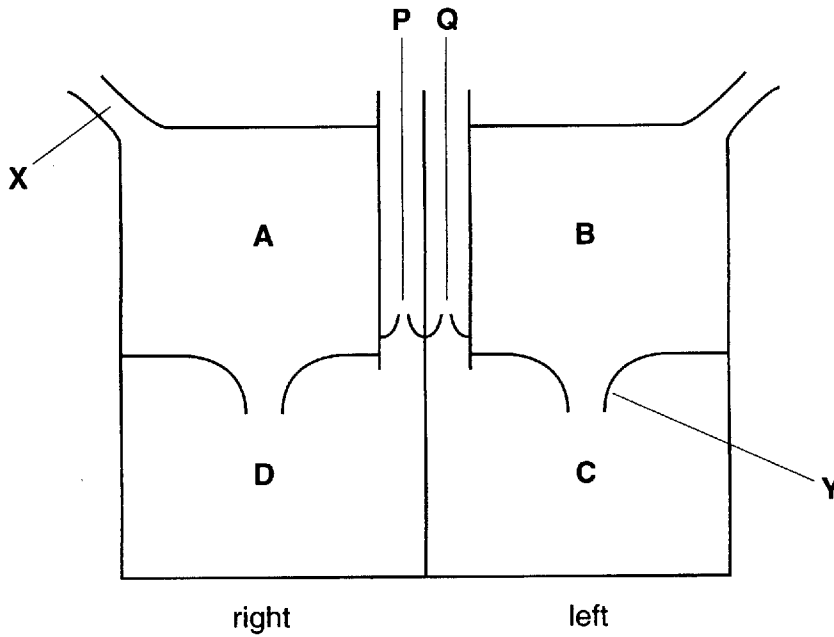


Fig. 3.1

- (a) (i) Draw arrows on Fig. 3.1 to show the direction of blood flow through the **left** side of the heart. [1]

- (ii) State the name of vessel **X** and valve **Y**.

vessel **X** .....

valve **Y** ..... [2]

- (iii) Explain why there are valves at **P** and **Q**.

.....  
 .....  
 .....  
 .....  
 ..... [2]









- (b) The synthesis of red blood cells is stimulated by the hormone erythropoetin (EPO) which is secreted by the kidneys. Some long distance athletes have been known to take a course of EPO as part of a training programme.

Suggest why some athletes have taken erythropoetin.

.....

.....

.....

.....

.....

.....[2]

[Total: 8]

**END OF QUESTION PAPER**

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*Copyright acknowledgements:*

Q.1 Fig. 1.2      Picture of tree from *GCSE Biology*, p305 fig. 4, by D. G. MacKean, published by John Murray, 1986.  
(ISBN 0 7195 4281 2)

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