OCR
RECOGNISING ACHIEVEMENT

OXFORD CAMBRIDGE AND RSA EXAMINATIONS
Advanced Subsidiary GCE

BIOLOGY 2803/01

Transport

Monday **2 JUNE 2003** Morning 45 minutes

Candidates answer on the question paper.
Additional materials:
Electronic calculator

Candidate Name	Centre Number	Candidate Number

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 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 stages in any calculations.

FOR EXAMINER'S USE		
Qu.	Max.	Mark
1	10	
2	10	
3	5	
4	14	
5	6	
TOTAL	45	

This question paper consists of 8 printed pages.

Registered Charity Number: 1066969
[Turn over

Answer **all** the questions.

1 **(a)** Fig. 1.1 shows a transverse section of a plant organ and Fig. 1.2 shows a xylem vessel element from one of the tissues **A**–**D** shown in this organ.

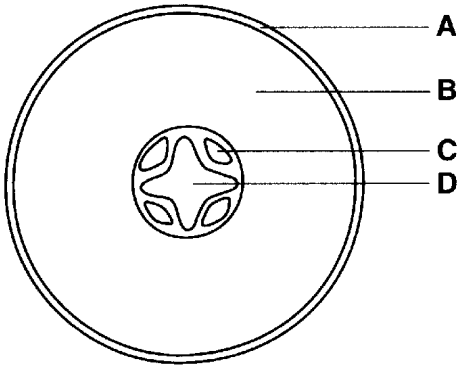

Fig. 1.1

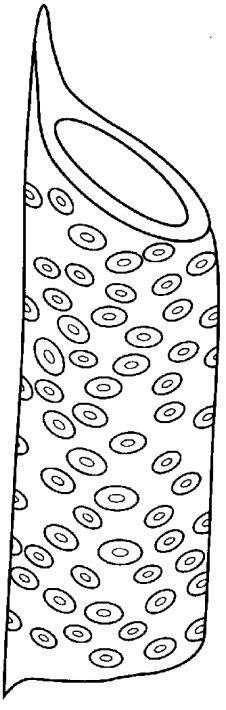

Fig. 1.2

(i) Name the organ shown in Fig. 1.1.

.....[1]

(ii) State in which of the tissues, **A**–**D**, xylem vessel elements are found.

.....[1]

(iii) Describe how xylem vessel elements are adapted for their function.

.....

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.....[3]

(b) The water potential of the soil in a field where wheat was growing successfully was measured and found to be –40 kPa.

(i) State which of the following water potential values is most likely to be found in the cell sap of the root hairs of these plants.

–40 kPa. –60 kPa. –20 kPa. –10 kPa.

Answer .....kPa [1]

(ii) What effect would flooding with seawater have on the water potential of the soil?

.....[1]

(iii) Explain what would happen to the wheat plants in the soil as a result of this change in water potential.

.....

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.....

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.....[3]

[Total: 10]

[Turn over

For Examiner's Use

2 **(a)** During the cardiac cycle the pressure in the different chambers of the heart varies in a regular pattern.

State in which one of the four chambers of the heart

(i) the highest pressure is generated;

.....[1]

(ii) the greatest change in pressure occurs.

.....[1]

(b) Fig. 2.1 shows the changes in blood pressure during one cardiac cycle.

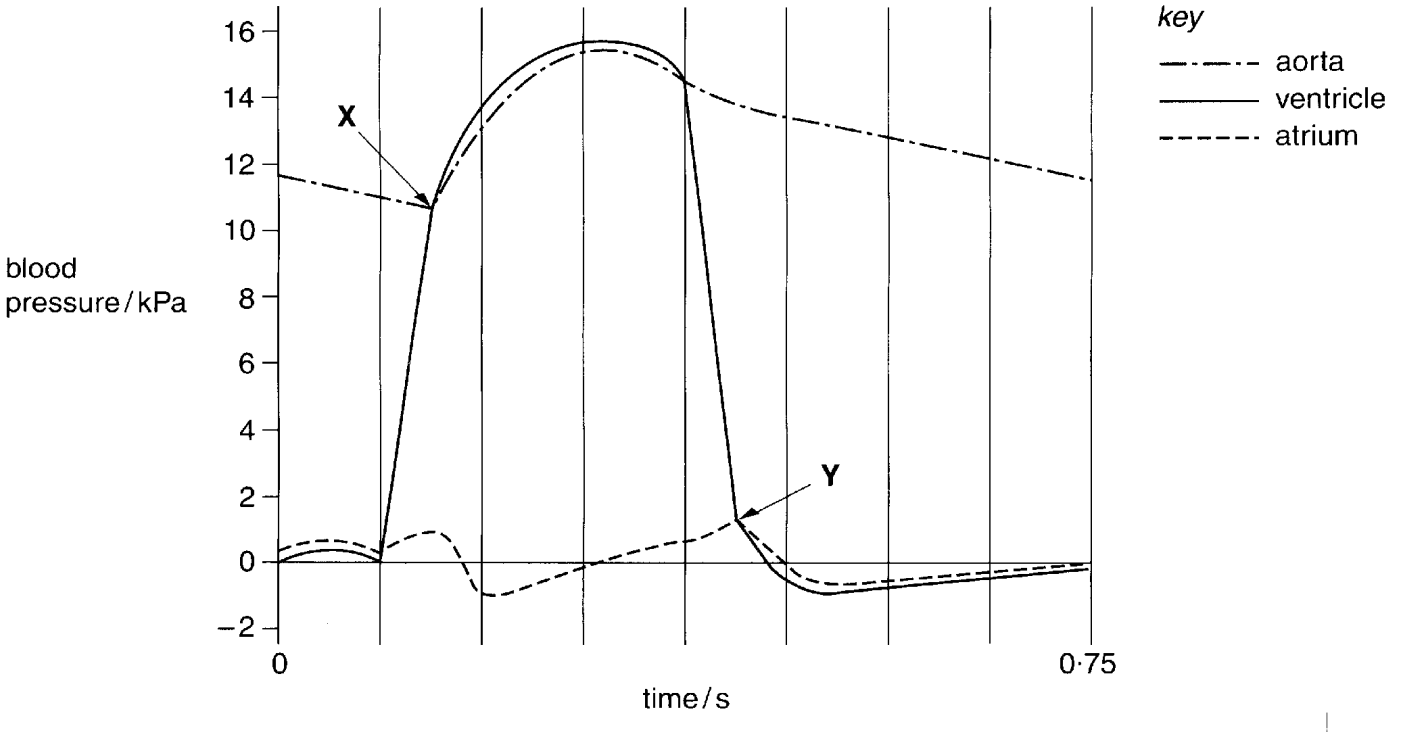

Fig. 2.1

(i) Use the information in Fig. 2.1 to calculate the heart rate in beats per minute. Show your working.

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Answer ..... beats per minute [2]

For Examiner's Use

(ii) Explain what is happening at **X** and **Y** on Fig. 2.1.

X .....

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.....[3]

Y .....

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.....[3]

[Total: 10]

3 Complete the following passage using the most appropriate word or words.

Some plants, such as cacti, inhabit dry areas. These plants of dry areas are known as ..... . Reduction of water loss by the process of ..... can be achieved by employing a variety of adaptations. In some species the leaves are needle-like, which reduces the ..... ratio, whilst in others the epidermis is covered by a thick layer of ..... . In order to conserve the greatest amount of water, many species shut their stomata during the ..... . [5]

[Total: 5]

[Turn over

For Examiner's Use

4 **(a)** Fig. 4.1 is a photomicrograph of a human blood smear.

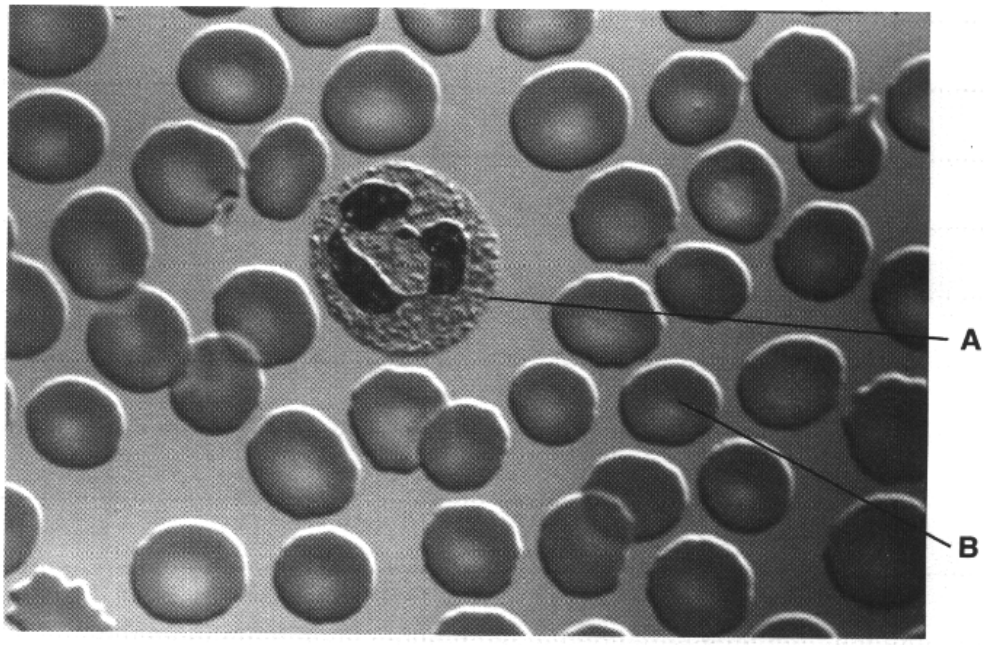

Fig. 4.1

(i) Cell type **A** is a white blood cell. Name this type of white blood cell, giving a reason for your identification.

name .....

reason .....

.....[2]

(ii) State what will happen to the numbers of cell type **B** if a person spends a long time at high altitude.

.....[1]

(iii) Explain the significance of this change in numbers of cell type **B.**

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.....[4]

For Examiner's Use

(b) In this question, one mark is available for the quality of written communication.

The mammalian blood system transports gases and unloads them in appropriate regions of the body.

Describe how the transport and unloading of **oxygen** occurs. Include in your answer a description of the mechanism of the Bohr effect.

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.....[6]

Quality of Written Communication [1]

[Total: 14]

For Examiner's Use

5 Fig. 5.1 shows the structures involved in gaseous exchange in mammals.

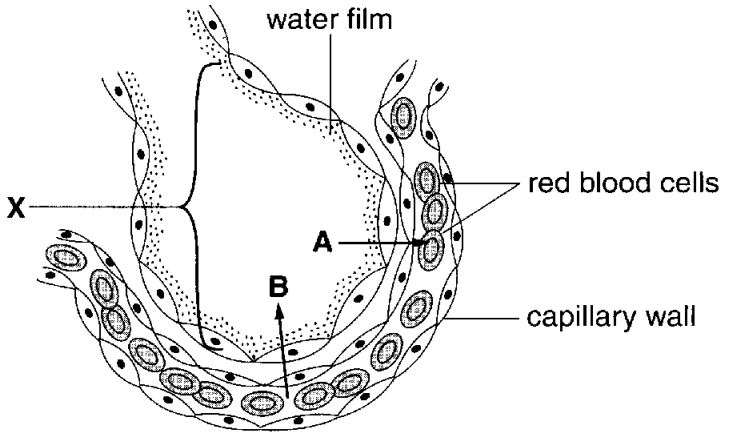

Fig. 5.1

(a) (i) Name the structure **X**. .....[1]

(ii) Name the process by which gases cross the gas exchange surface.

.....[1]

(iii) **A** and **B**, on Fig. 5.1, show the directions taken by gases crossing the gas exchange surface.

Name the gases moving in directions **A** and **B**.

direction **A** .....

direction **B** .....[1]

(b) Structure **X**, shown in Fig. 5.1, is very delicate. The surface tension of the water film shown in the diagram would cause **X** to collapse if it were not for a substance in the film that lowers the surface tension. This substance is secreted in the fetal lungs late in pregnancy. Premature babies sometimes display breathing difficulties, a condition known as Respiratory Distress Syndrome. Without treatment, premature babies may become exhausted.

Suggest the cause of this condition and suggest why premature babies may become exhausted.

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.....[3]

[Total: 6]