OCR
RECOGNISING ACHIEVEMENT

OXFORD CAMBRIDGE AND RSA EXAMINATIONS
Advanced Subsidiary GCE

HUMAN BIOLOGY 2856

Blood, Circulation and Gaseous Exchange

Monday **6 JUNE 2005** Morning 1 hour

Candidates answer on the question paper.
Additional materials:
Electronic calculator
Ruler (cm/mm)

Candidate Name	Centre Number	Candidate Number

TIME 1 hour

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.

FOR EXAMINER'S USE		
Qu.	**Max.**	**Mark**
1	9	
2	8	
3	9	
4	14	
5	10	
6	10	
TOTAL	60	

This question paper consists of 14 printed pages and 2 blank pages.

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For Examiner's Use

Answer all the questions.

1 Fig. 1.1 shows a light micrograph of a blood smear taken by a laboratory worker.

Fig. 1.1

(a) Name cells A and B.

A .....

B ..... [2]

(b) Explain why blood is classed as a tissue.

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..... [2]

(c) Describe how a blood smear, such as that shown in Fig. 1.1, is prepared for viewing under a light microscope.

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..... [5]

[Total: 9]

2 Haemoglobin is a protein molecule made from four long chains of amino acids.

(a) In the space below, draw the generalised structure of an amino acid.

[2]

(b) **(i)** Name the **two** groups that occur in all amino acids.

1 .....

2 ..... [2]

(ii) State the name of the bond formed between two amino acids.

..... [1]

(iii) Name the type of reaction that would break the chemical bond between the two amino acids.

..... [1]

(c) State **two** differences between the **secondary** and **tertiary** structure of the protein chains in haemoglobin.

1 .....

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2 .....

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..... [2]

[Total: 8]

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For Examiner's Use

3 **(a)** Table 3.1 shows some of the components of blood and tissue fluid. Complete the table using the words *present* or *absent*.

Table 3.1

	components of blood and tissue fluid	
	blood	tissue fluid
red blood cells	present	
white blood cells		present
water		present
plasma proteins	present	

[4]

(b) Fig. 3.1 shows a simplified diagram of a capillary and the surrounding tissue fluid.

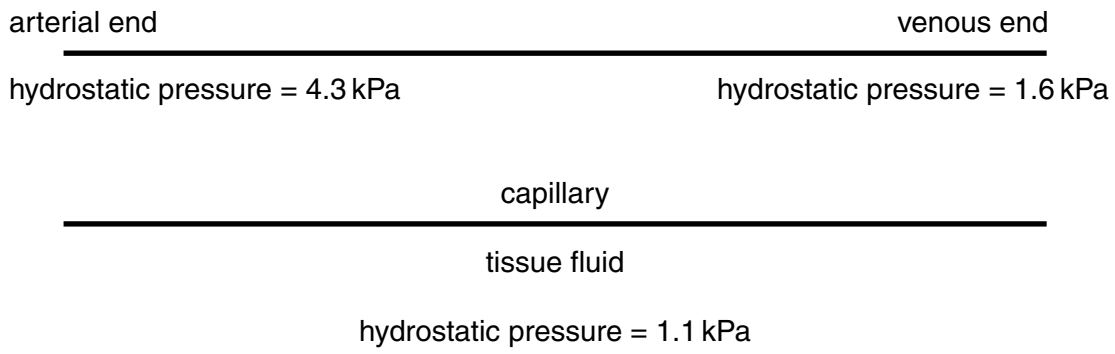

Fig. 3.1

On Fig. 3.1, indicate with an arrow the direction of blood flow. [1]

(c) Using the information in Fig. 3.1, explain in terms of water potential, the **net** movement of fluid between the capillary and the tissue fluid.

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..... [4]

[Total: 9]

For Examiner's Use

4 **(a)** Fig. 4.1 gives information about the relative thickness of the walls of three chambers of the heart;

- left ventricle
- right ventricle
- right atrium.

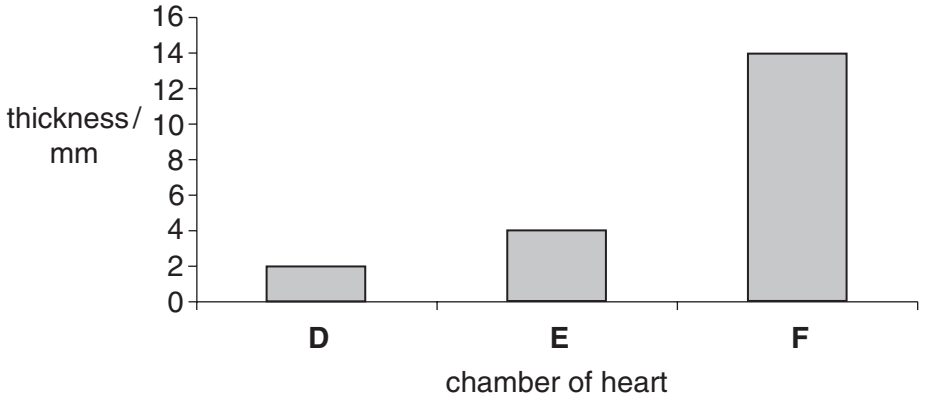

Fig. 4.1

(i) State which of these three chambers are identified by the letters **D**, **E** and **F**.

D .....

E .....

F ..... [3]

(ii) Explain, with reference to its function, why the wall of chamber **F** is much thicker than the walls of chambers **D** and **E**.

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..... [3]

One of the most valuable tools used for studying the heart and identifying heart abnormalities, is the electrocardiogram (ECG). Fig. 4.2 shows an ECG trace obtained from a healthy person.

A graph has been removed due to third party copyright restrictions

Details:

A graph showing an ECG trace obtained from a healthy person

Fig. 4.2

(b) Describe the electrical activity in the heart during the P wave and the QRS complex:

(i) during the P wave,

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(ii) during the QRS complex.

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..... [4]

(c) When an ECG is being carried out, various precautions must be taken to ensure accurate results. One such precaution may be telling the person to sit still during the procedure.

Explain why this is important.

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..... [2]

(d) The ECG does not identify all abnormalities of the heart.

Suggest **one** condition that it will not diagnose and explain why.

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..... [2]

[Total: 14]

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[Turn over

5 • There are 62 000 preventable deaths in the United Kingdom every year because of poor blood pressure control.

• If high blood pressure (hypertension) was controlled to a target pressure of 150/90 mmHg, 21 000 deaths from strokes and 41 000 deaths from heart attacks could be prevented.

• More than one third of non-fatal strokes and heart attacks would also be prevented so that the total reduction in strokes and heart attacks would be 120 000 per year.

(a) Outline how hypertension may contribute to the development of coronary heart disease (CHD).

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..... [3]

(b) In this question, one mark is available for the quality of spelling, punctuation and grammar.

Describe how a sphygmomanometer is used to measure blood pressure **and** how the results are interpreted.

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.....[6]

Quality of Written Communication [1]

[Total: 10]

For Examiner's Use

6

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Q1. CIE Science Diagrams For Examiners. 2140005. Version 1.0. 2001. CD ROM
Fig. 4.2 www.hertmed.com/literature/journal2.htm
Q6. www.ash.org.uk

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