



ADVANCED SUBSIDIARY GCE
BIOLOGY
 Transport

2803/01

Candidates answer on the question paper

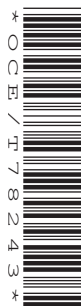
OCR Supplied Materials:
 None

Other Materials Required:

- Electronic calculator
- Ruler (cm/mm)

Monday 1 June 2009
Afternoon

Duration: 45 minutes



Candidate Forename		Candidate Surname	
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Centre Number						Candidate Number				
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INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided, however additional paper may be used if necessary.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is **45**.
- 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 calculation.
- This document consists of **12** pages. Any blank pages are indicated.

FOR EXAMINER'S USE

Qu.	Max.	Mark
1	3	
2	5	
3	11	
4	13	
5	9	
6	4	
TOTAL	45	

Answer **all** the questions.

- 1 Both mammals and plants can have transport systems containing various types of tubular vessel.

Complete the table below by placing a tick (✓) or a cross (✗) in the appropriate boxes.

feature	mammal	plant
the contents of the tubular vessels are pumped round the system by an organ		
the tubular vessels form a nutrient transport system		
some of the tubular vessels are living and some are dead		

[3]

[Total: 3]

- 2 Fig. 2.1 shows cross sections of two types of blood vessel, labelled **A** and **B**, from the mammalian blood system.

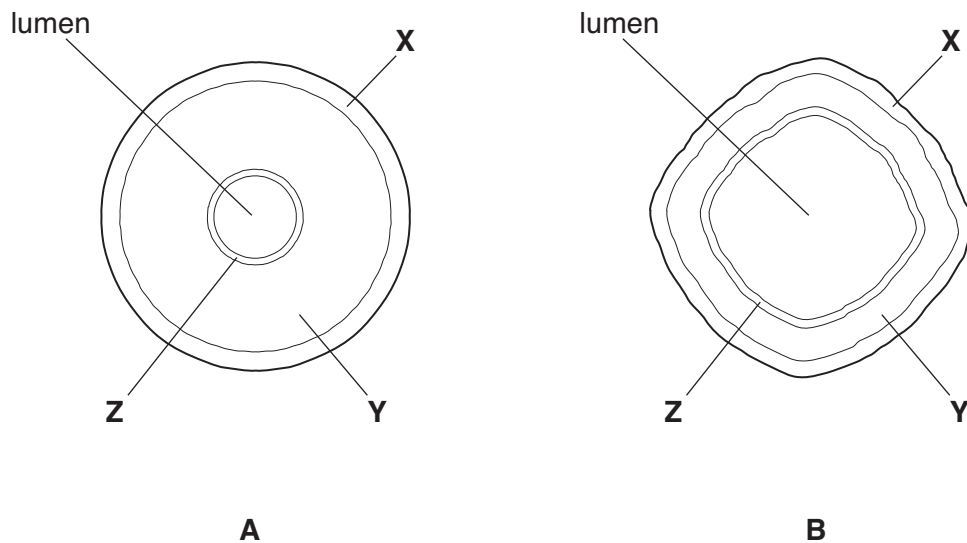


Fig. 2.1

- (a) With reference to Fig. 2.1, name the types of blood vessel labelled **A** and **B**.

A

B [1]

- (b) **Z** is known as the tunica intima.

State the name of the surface layer of cells in **Z** that lines the lumen.

..... [1]

(c) Describe briefly the structure of layers **X** and **Y**.

X

.....

Y

..... [3]

[Total: 5]

- 3 (a) The mammalian circulatory system is described as a closed double circulation.

Fig. 3.1 is a simplified plan of a closed double circulatory system.

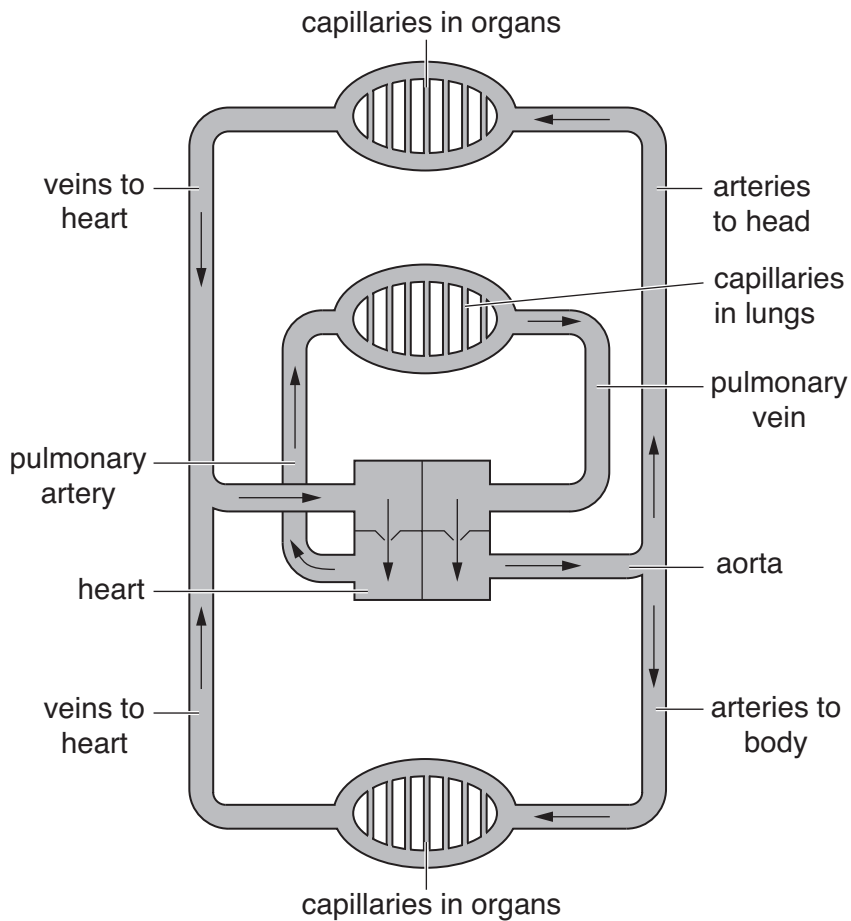


Fig. 3.1

- (i) Using the information in Fig. 3.1 to help you, explain what is meant by the term *closed double circulation*.

.....

.....

.....

.....

..... [3]

- (ii) Suggest **two** advantages of the double circulation shown in Fig. 3.1.

1

.....

2

..... [2]

- (b) Fig. 3.2 shows some features of the external and internal structure of the mammalian heart and associated blood vessels.

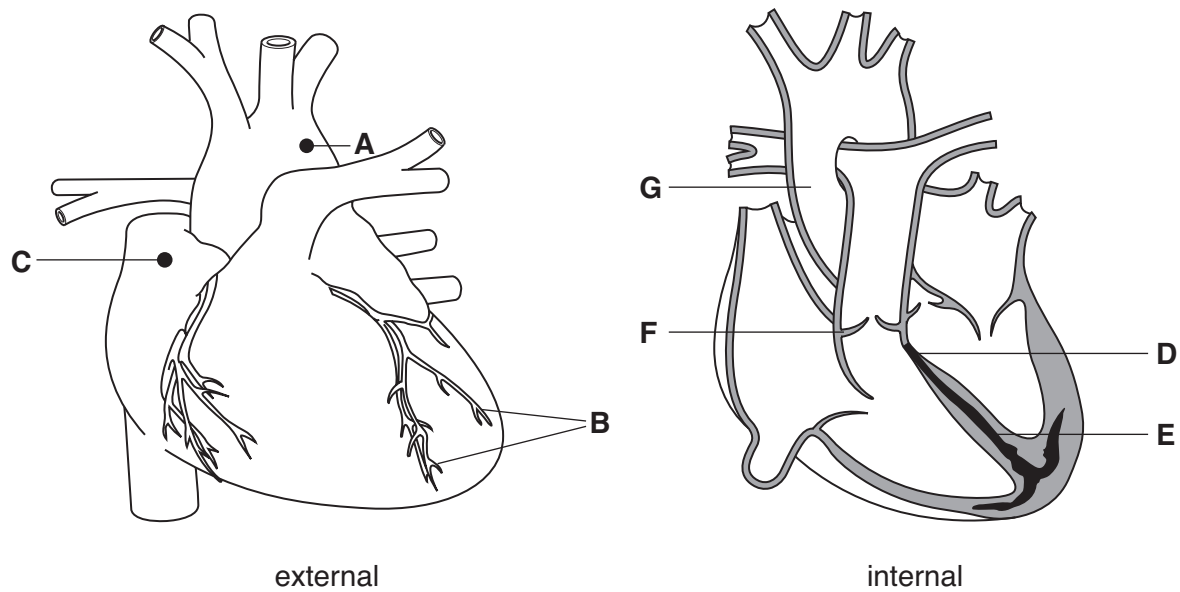


Fig. 3.2

Table 3.1 below lists some functions of parts of the heart.

Table 3.1

function	letter
contracts to force blood into a ventricle	P
stops impulses crossing the septum between the atria and the ventricles	Q
acts as a pacemaker	R
carries blood away from the heart to the body	S
conducts impulses to the apex of the heart	T
relays the impulses to the septum between the ventricles	U

Complete the following table by:

- identifying each of the features listed, using an appropriate letter from Fig. 3.2
- matching a function to the feature, using the appropriate letter from Table 3.1.

The first one has been done for you.

feature	letter on Fig. 3.2	letter in Table 3.1
aorta	G	S
sino-atrial node		
atrio-ventricular node		
Purkyne fibres		

[6]

[Total: 11]

Turn over

4 Fig. 4.1 shows the outline of some cells from the phloem of a dicotyledonous plant.

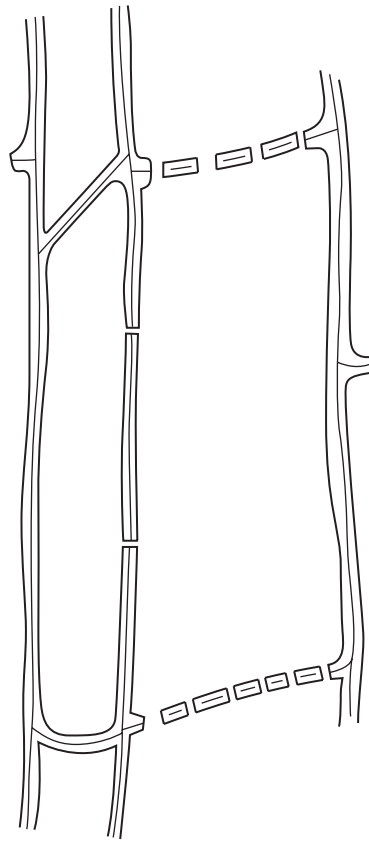


Fig. 4.1

(a) (i) Label the following structures on the diagram using label lines:

sieve tube sieve pore companion cell plasmodesma [4]

(ii) Draw and label **a nucleus** or **nuclei** where appropriate on Fig. 4.1. **[1]**

(b) Name the carbohydrate that is transported in phloem.

..... **[1]**

[6]

Quality of Written Communication [1]

[Total: 13]

- 5 Table 5.1 compares the mean red blood cell count of a group of people when they were living at sea level and after they had spent several weeks at an altitude of 5000 metres.

Table 5.1

altitude/m	number of red blood cells/ 10^{12} dm^{-3}
0	4.85
5000	6.15

- (a) Calculate the % increase in red blood cells after spending several weeks at an altitude of 5000 metres.

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

Answer =% [2]

- (b) A company advertises a programme to athletes which involves living and training at altitude in order to improve their performance.

Explain why the performance of an athlete would be expected to improve as a result of such altitude training.

.....

.....

.....

.....

.....

..... [3]

- (c) Fig. 5.1 shows the effect of two different partial pressures of carbon dioxide on the oxygen dissociation curve for haemoglobin.

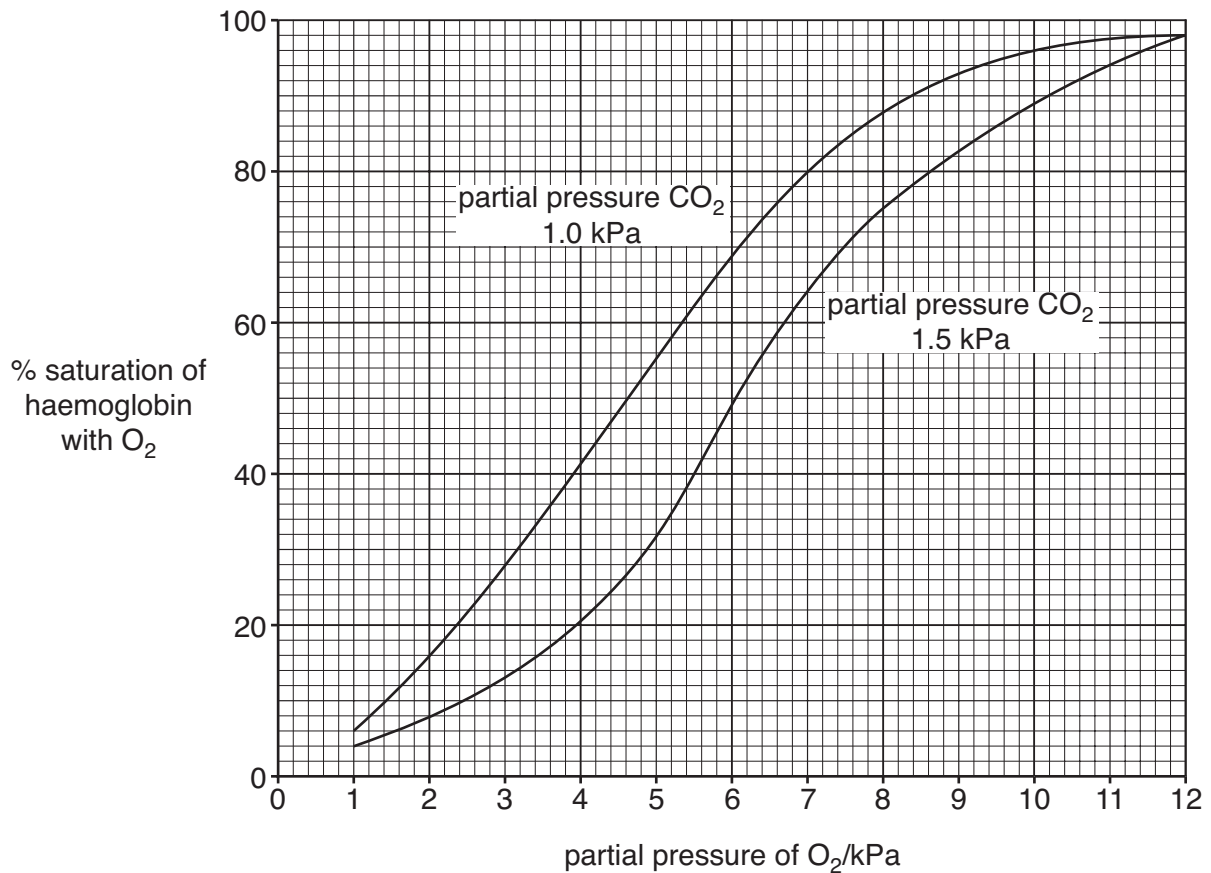


Fig. 5.1

With reference to Fig. 5.1,

- (i) name this effect of carbon dioxide on the oxygen dissociation curve for haemoglobin;

..... [1]

- (ii) outline how this effect ensures more efficient delivery of oxygen to the tissues when exercising.

.....

.....

.....

.....

..... [3]

[Total: 9]

- 6 Fig. 6.1 is a plan diagram of a transverse section of a leaf from *Nerium oleander*, a plant adapted to survive in dry areas.

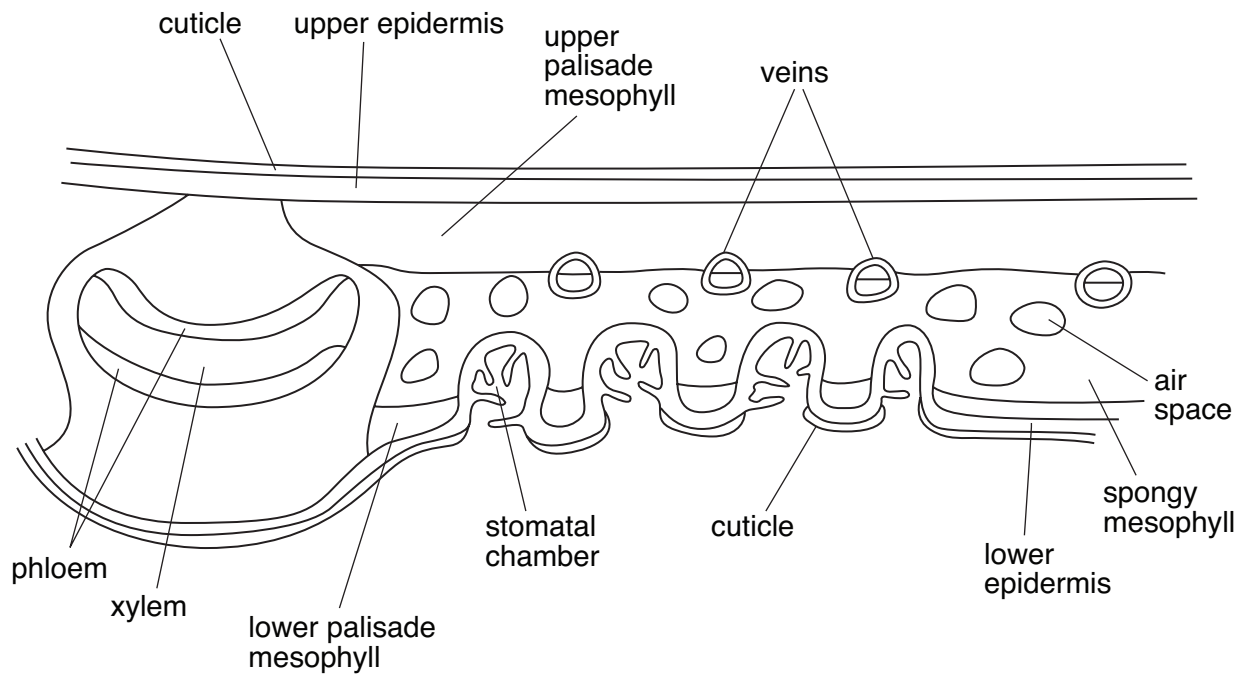


Fig. 6.1

Fig. 6.2 shows the lower epidermis that lines the stomatal chambers in greater detail.

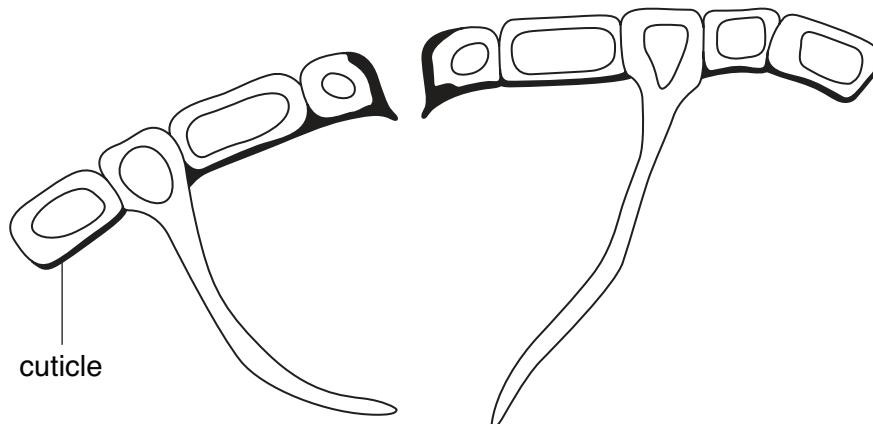


Fig. 6.2

Explain how the following features shown in Fig. 6.1 and Fig. 6.2 help the plant to survive in dry areas.

cuticle

.....

.....

.....

.....

stomatal chambers

.....

.....

.....

..... [4]

[Total: 4]

END OF QUESTION PAPER

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