

**OXFORD CAMBRIDGE AND RSA EXAMINATIONS**

**Advanced Subsidiary GCE**

**BIOLOGY**

Transport



**2803/01**

Monday

**5 JUNE 2006**

Morning

45 minutes

Candidates answer on the question paper.

Additional materials:

Electronic calculator

Ruler (cm/mm)

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 provided on the question paper.
- Pencils may be used for diagrams or graphs only.
- Read each question carefully before starting your answer.
- Do not write in the bar code. Do not write in the grey area between the pages.
- **DO NOT WRITE IN THE AREA OUTSIDE THE BOX BORDERING EACH PAGE. ANY WRITING IN THIS AREA WILL NOT BE MARKED.**

**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                  | 10        |      |
| 2                  | 9         |      |
| 3                  | 5         |      |
| 4                  | 11        |      |
| 5                  | 10        |      |
| <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 is a diagram of a cross section of an organ from a dicotyledonous plant showing some of the tissues.

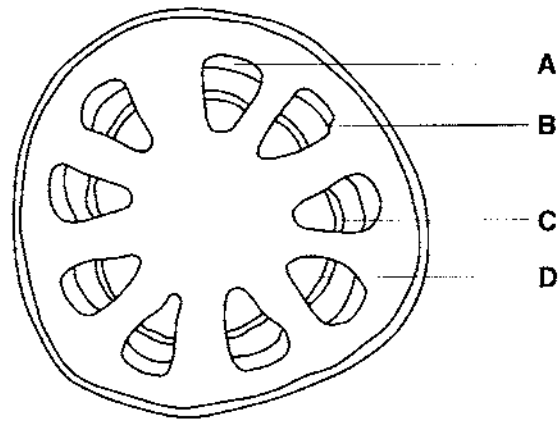


Fig. 1.1

- (a) (i) Name the plant organ shown in Fig. 1.1.

..... [1]

- (ii) State which of the regions **A** to **D** is phloem tissue.

..... [1]

- (b) From the list below, circle the carbohydrate that is transported in phloem.

auxin    fructose    glucose    glycine    glycogen    starch    sucrose    [1]



(c) Phloem is responsible for the transport of carbohydrate in plants. Fig. 1.2 shows the structure of the cells in phloem.

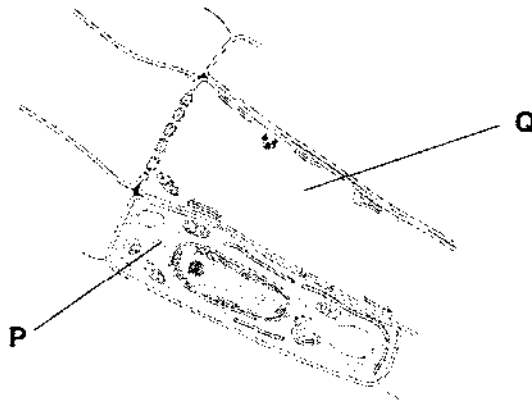


Fig. 1.2

(i) Name the cells P and Q in Fig. 1.2.

P .....

Q ..... [2]

(ii) Outline how P and Q are involved in the transport of carbohydrate in phloem.

.....

.....

.....

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.....

.....

..... [3]

(d) Carbohydrate moves from regions of plants called sources to regions called sinks.

Explain how, at different times, the same plant root may be a source or a sink.

.....

.....

.....

.....

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.....

.....

.....

.....

..... [2]

[Total: 10]

[Turn over



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2 (a) Fig. 2.1 shows some mammalian blood vessels in cross section.

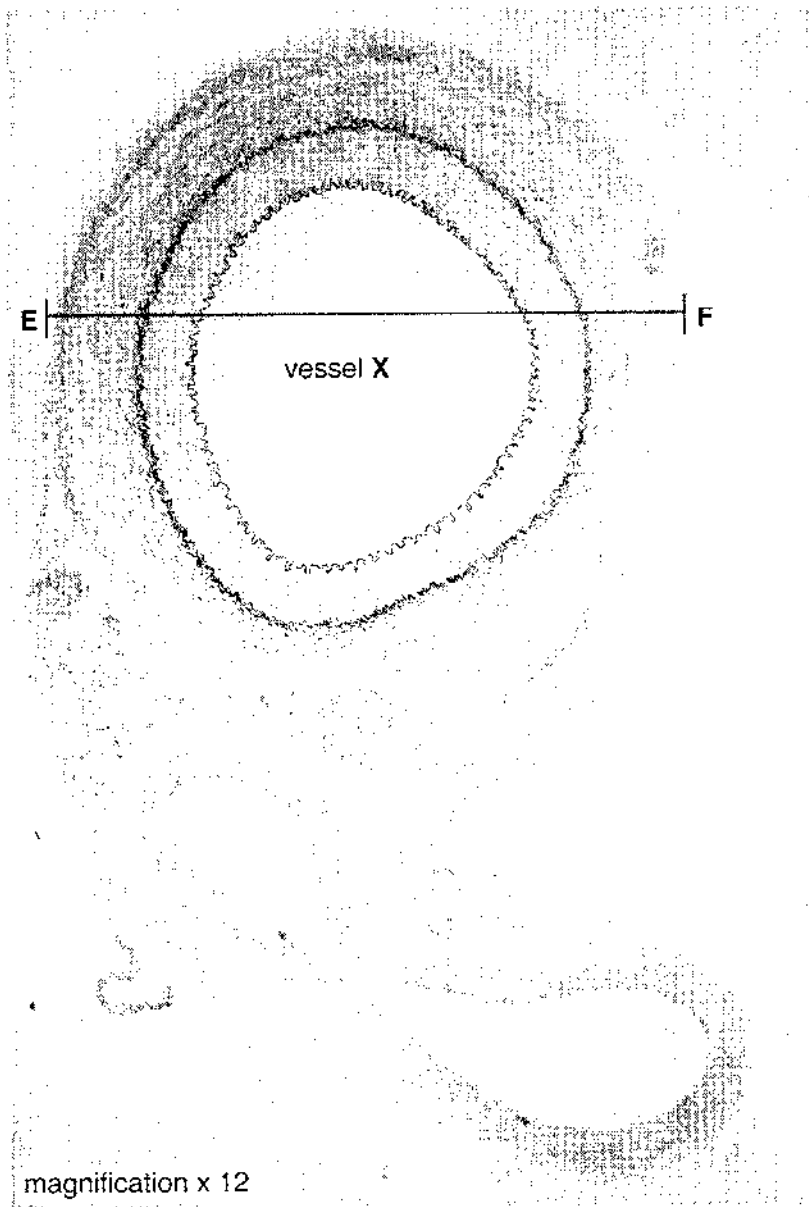


Fig. 2.1

Vessel X is an artery. Its magnification is given on Fig. 2.1.

Calculate the actual width of the vessel in mm between points E and F. Show your working and express your answer to the nearest whole number.

Answer = ..... mm [2]



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- 3 Complete the following passage on water uptake by the root using the most appropriate word or words.

Water moves from the soil to the xylem in the root down a ..... gradient.

The root hairs provide a large surface area for water uptake and once water has been taken up it crosses to the xylem by two pathways. The ..... pathway goes via the cell walls but is blocked at the ..... by the ..... . The other route involves the water crossing cell membranes by the process of osmosis and entering the cytoplasm. This is called the ..... pathway.

[5]

[Total: 5]



4 Table 4.1 contains information about various components of the mammalian circulatory system.

Table 4.1

|                       | blood in aorta | tissue fluid | lymph | blood in vena cava |
|-----------------------|----------------|--------------|-------|--------------------|
| red blood cells       | many           |              | none  | many               |
| white blood cells     |                | some         | some  | many               |
| glucose concentration | high           | high         |       | high               |
| pressure              | high           | low          | low   |                    |

(a) (i) Complete each of the shaded boxes in Table 4.1 with the most appropriate word. [4]

(ii) Explain the differences recorded in the table for glucose and pressure.

glucose .....

.....

.....

.....

pressure .....

.....

.....

.....

..... [4]

(b) The blood also contains hydrogen carbonate ions ( $\text{HCO}_3^-$ ). Describe how these ions are formed in the blood.

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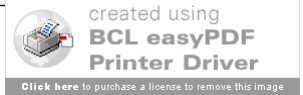
..... [3]

[Total: 11]

[Turn over



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5 Fig. 5.1 shows an external view of a human heart as seen from the front.

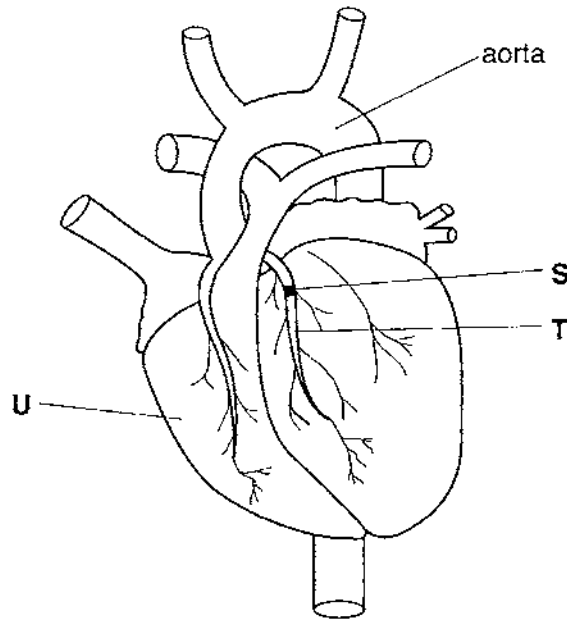


Fig. 5.1

(a) (i) Name the structures T and U.

T .....

U ..... [2]

(ii) Suggest the consequences of a blockage at point S as shown on Fig. 5.1.

.....

.....

.....

..... [2]

[Turn over





(b) Figs. 5.2 and 5.3 are diagrams to show the internal structure of the heart and its associated circulatory system in a simplified form. Fig. 5.2 represents the system for a mammal and Fig. 5.3 that for a frog (an amphibian).

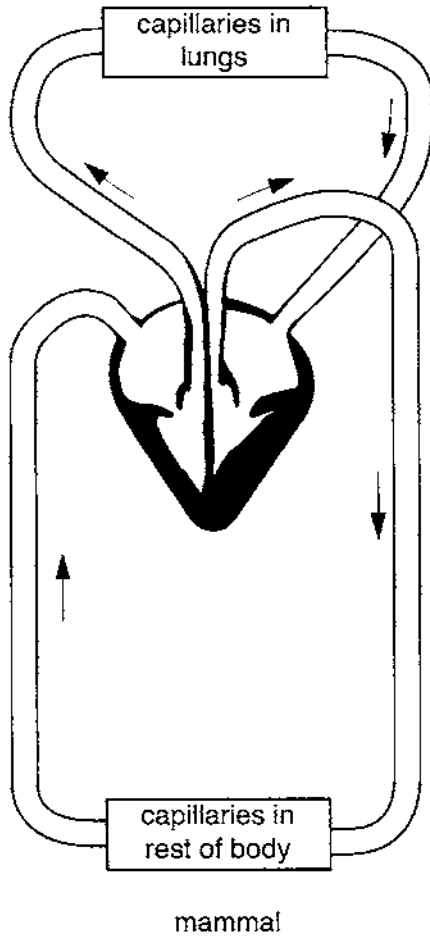


Fig. 5.2

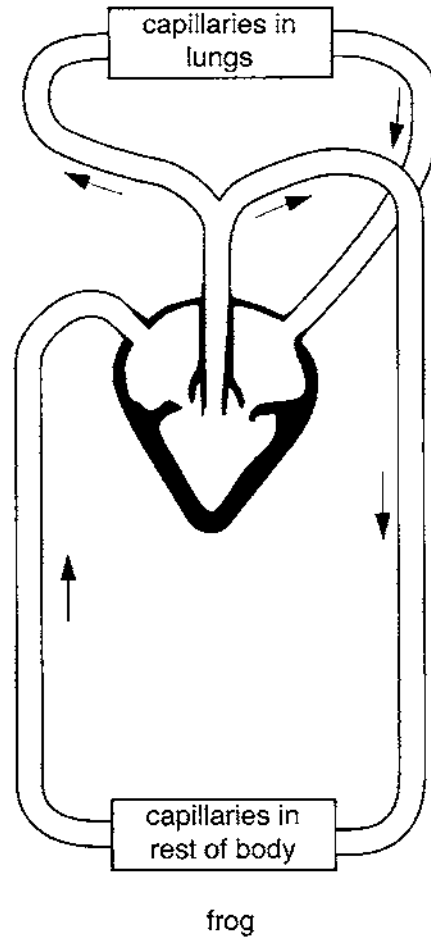


Fig. 5.3

Both systems are described as closed systems. The mammalian system is also described as a complete double circulation but the frog as a partial double circulation.

(i) State what is meant by a closed system.

.....

..... [1]



