

Centre Number	Candidate Number	Name
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UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
General Certificate of Education Ordinary Level

**BIOLOGY**

**5090/02**

Paper 2 Theory

October/November 2006

**1 hour 45 minutes**

Candidates answer on the Question Paper.  
Additional Materials: Answer Paper

**READ THESE INSTRUCTIONS FIRST**

Write your Centre number, candidate number and name on all the work you hand in.  
Write in dark blue or black pen.  
You may use a soft pencil for any diagrams, graphs or rough working.  
Do not use staples, paper clips, highlighters, glue or correction fluid.

**Section A**

Answer **all** questions.  
Write your answers in the spaces provided on the question paper.

**Section B**

Answer **all** the questions including questions 6, 7 and 8 **Either** or 8 **Or**.  
Write your answers on the separate answer paper provided.  
Write an **E** (for Either) or an **O** (for Or) next to the number 8 in the grid below to indicate which question you have answered.

You are advised to spend no longer than one hour on Section A and no longer than 45 minutes on Section B.  
At the end of the examination, fasten all your work securely together.  
The number of marks is given in brackets [ ] at the end of each question or part question.

FOR EXAMINER'S USE	
Section A	
Section B	/
6	
7	
8	
<b>Total</b>	

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



**Section A**

Answer **all** questions in this section.

Write your answers in the spaces provided.

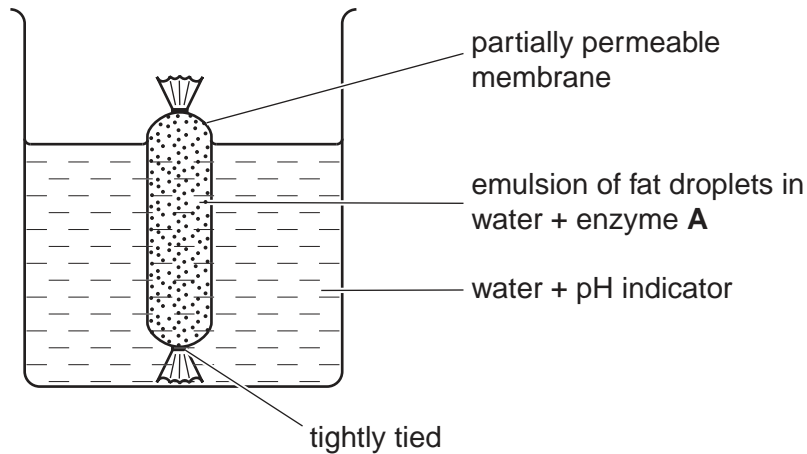
- 1 (a) Describe how the products of fat digestion enter a person's blood.

.....

.....

.....[4]

Fig. 1.1 shows apparatus at the start of an experiment to investigate the digestion of an emulsion of fat droplets in water by enzyme **A**.



**Fig. 1.1**

The pH indicator is green in a pH of 7, blue when the pH is above 7 and red when it is below 7. The apparatus is kept at 40°C for 20 minutes during which time the indicator changes from green to red.

- (b) (i) State the identity of enzyme **A**. .....

- (ii) Explain why the apparatus was kept at 40°C.

.....

.....[2]

- (c) Name the products of digestion of the emulsion by enzyme **A**.

.....[2]

(d) Describe the processes which led to the change in pH.

.....

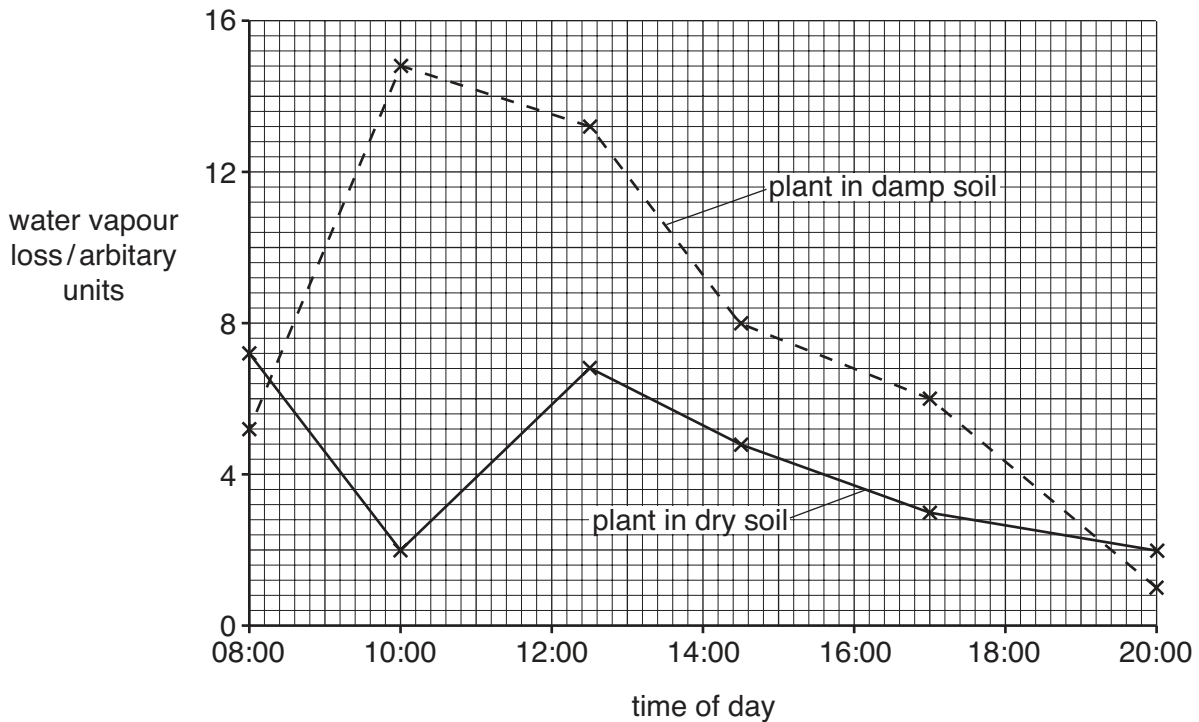
.....

.....

.....[3]

[Total: 11]

- 2 Fig. 2.1 shows a comparison of water vapour loss by a plant growing in damp soil and a plant growing in dry soil.



**Fig. 2.1**

- (a) (i) State the term for the loss of water vapour by a plant.

.....[1]

- (ii) State the time of day when the total water vapour loss from the two plants taken together is the greatest.

.....[1]

**(b) (i)** Explain the rise in the rate of water vapour loss between 08:00 and 10:00 by the plant in damp soil.

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

**(ii)** Suggest why the rate of water vapour loss from the plant in dry soil decreased during the same period of time.

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

**(c)** Suggest why the temperature of the plant in dry soil may be higher at mid-day than that of the plant in damp soil.

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

[Total: 10]

- 3 Fig. 3.1 shows how a blocked blood vessel in the heart can be by-passed using an artificial blood vessel.

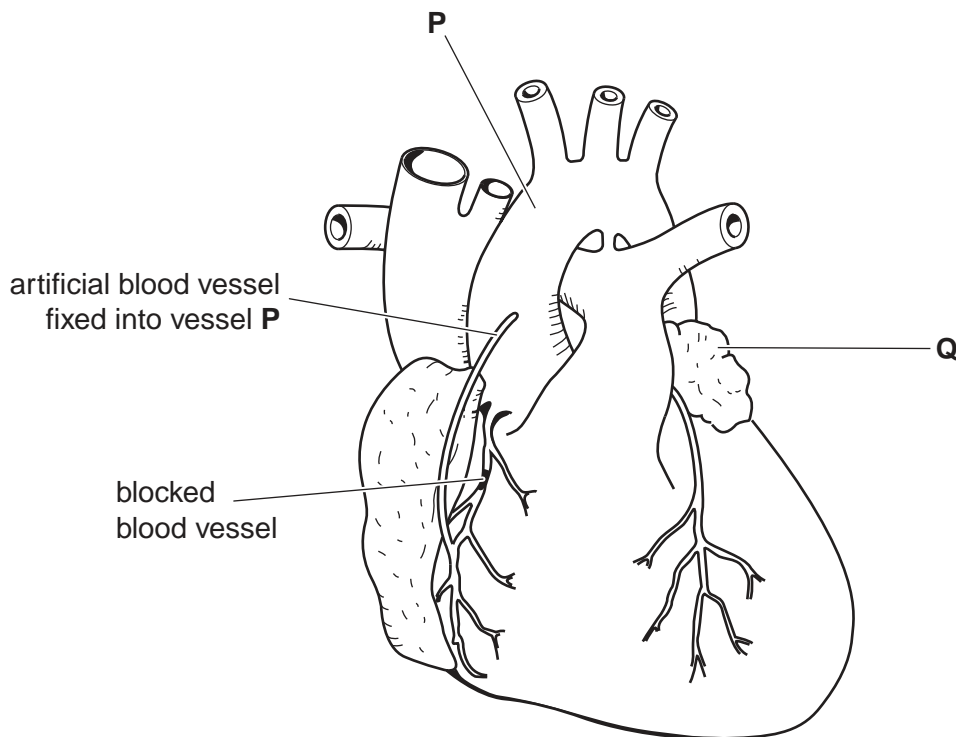


Fig. 3.1

- (a) (i) Name the blocked blood vessel. ....[2]

- (ii) Identify structures P and Q on Fig. 3.1.

P .....

Q ..... [2]

- (b) Sometimes, instead of an artificial blood vessel being used for the graft, a vein is taken from elsewhere in the patient's body.

Suggest two ways in which a vein might not be as suitable for carrying blood to the heart muscle as the blood vessel in the heart before it became blocked.

1 .....

2 ..... [2]

(c) Fig. 3.2 shows the same blood vessel, as in (a)(i) but this time the blockage is being treated with the use of a 'stent'.

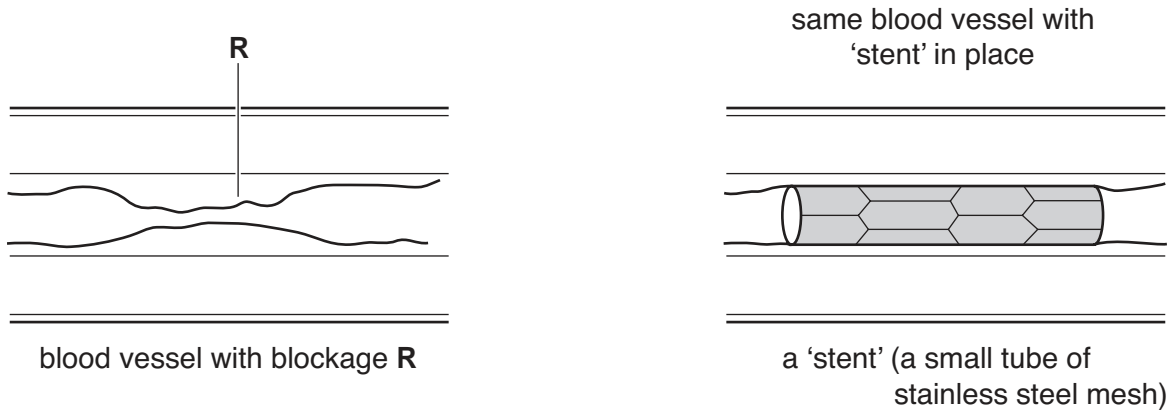


Fig. 3.2

(i) Name two components of the material that is causing the blockage at R.

1 .....

2 ..... [2]

(ii) Suggest and explain why patients are given 'anti-platelet' drugs before inserting the stent.

.....

.....

..... [2]

[Total: 10]

- 4 Dry mass is the mass of all chemicals, excluding water, present in a structure or organism.

Some seeds were placed in an incubator at 25 °C and left to germinate and grow in the dark for 5 days.

Table 4.1 shows dry mass in samples of the resulting seedlings.

**Table 4.1**

	day 0	day 1	day 2	day 3	day 4	day 5
whole seeds / g	225	210	208	206	175	155
food store / g	200	183	180	168	129	96
radicle and plumule only / g	2	4	5	15	23	36

- (a) (i) Water is needed for germination. State another condition necessary for germination.

.....[1]

- (ii) Name the food storage region in a seed.

.....[1]

- (iii) Explain why the total mass of the food storage region together with the radicle and plumule is always less than the mass of the whole seedling.

.....[1]

- (b) Explain the changes in mass over the first five days of

- (i) the food storage region,

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

- (ii) the radicle and plumule.

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



(c) If the seedlings were exposed to light from day 2 to day 5, suggest and explain what would happen to the dry masses of

(i) the food storage region,

.....  
.....

(ii) radicle and plumule.

.....  
.....

[4]

[Total: 11]

5 Fig. 5.1 shows the development of a zygote into a fetus.

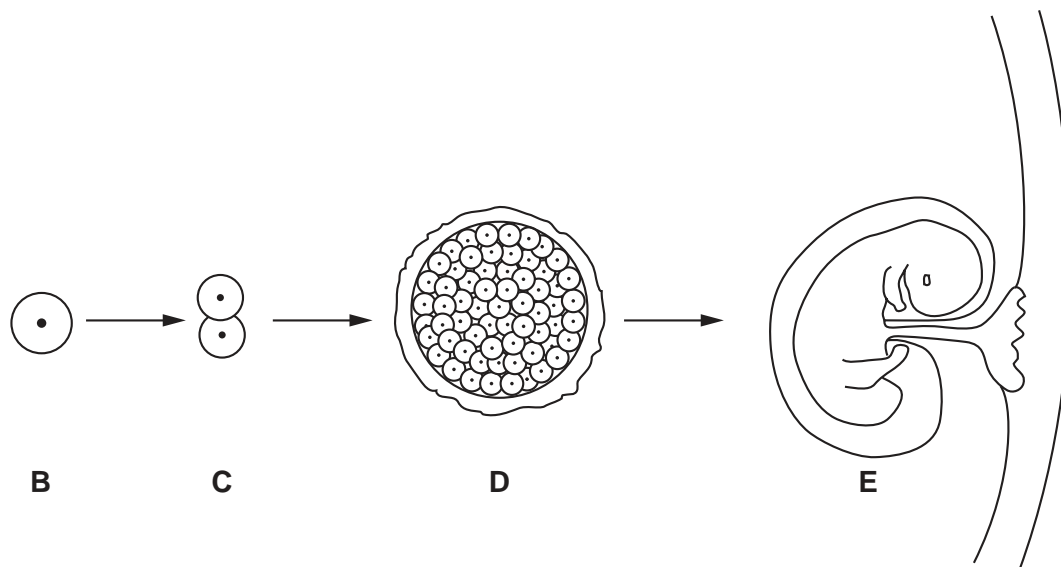


Fig. 5.1

(a) State whereabouts in the female reproductive system structure **C** would be found.

.....[1]

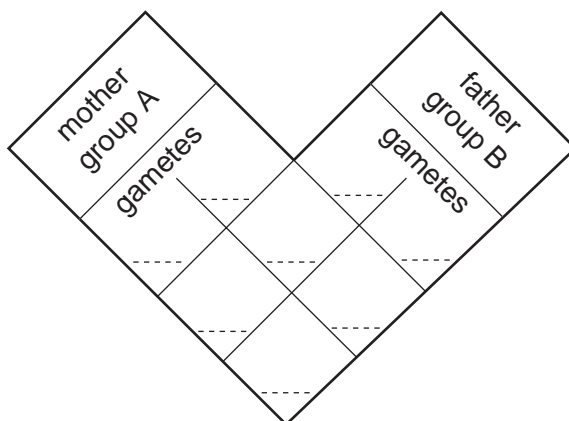
(b) Name the type of cell division occurring in Fig. 5.1.

.....[1]

(c) Describe what happens to structure **D** to enable it to continue to develop into a fetus.

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

(d) If the embryo's mother had blood group A and its father had blood group B, complete the grid below to show how the embryo could have blood group O. Use  $I^A$ ,  $I^B$  and  $I^o$  to represent the alleles and clearly indicate any embryo that has blood group O.



[4]

[Total: 8]

**Section B**

Answer **three** questions.

Question **8** is in the form of an **Either/Or** question. Only one part should be answered.

Write your answers on the separate answer paper provided.

- 6 (a)** State the differences between osmosis and active transport. [3]
- (b)** Describe an example of active transport in
- (i)** a plant and
- (ii)** a human being.

In each case, explain the importance of the transported substances. [7]

[Total: 10]

- 7 (a)** Describe the events that occur after the body temperature falls that will return the body temperature to its normal level. [7]
- (b)** Explain what is meant by control by 'negative feed back'. [3]

[Total: 10]

Answer only **Question 8 Either** or **Question 8 Or**.

- 8 Either (a)** Explain how mosquitoes are able to transmit diseases that affect humans. [5]
- (b)** Describe the cause, symptoms and treatment of syphilis. [5]

[Total : 10]

- 8 Or (a)** Describe the part played by artificial selection in the production of a **named** economically important plant or animal. [6]
- (b)** With reference to a **named** example, explain why asexual reproduction in plants is of commercial importance. [4]

[Total: 10]

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Fig. 3.1                      © British Heart Foundation.

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