

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	
Total	

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**.

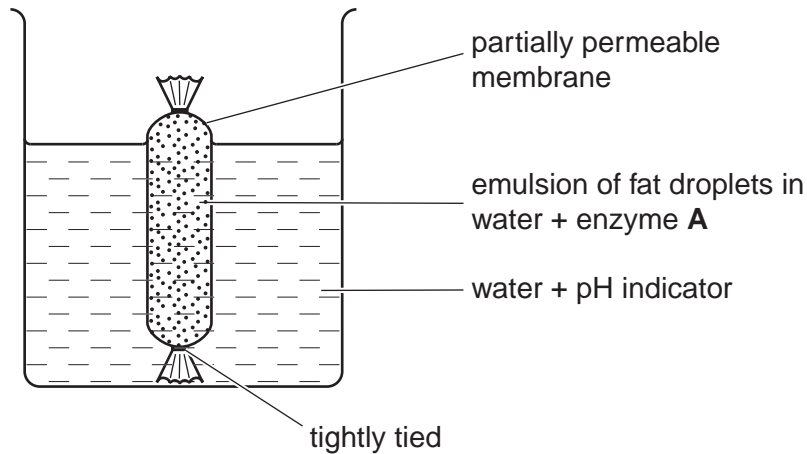


Fig. 1.1

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.

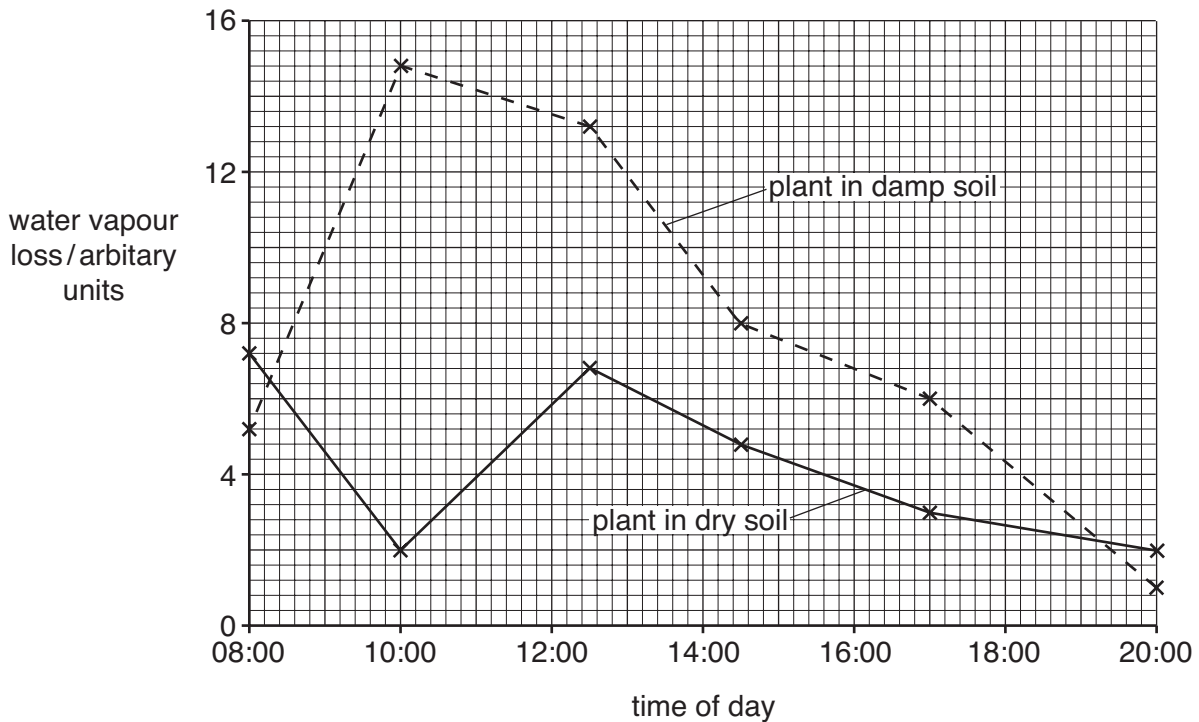


Fig. 2.1

- (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.

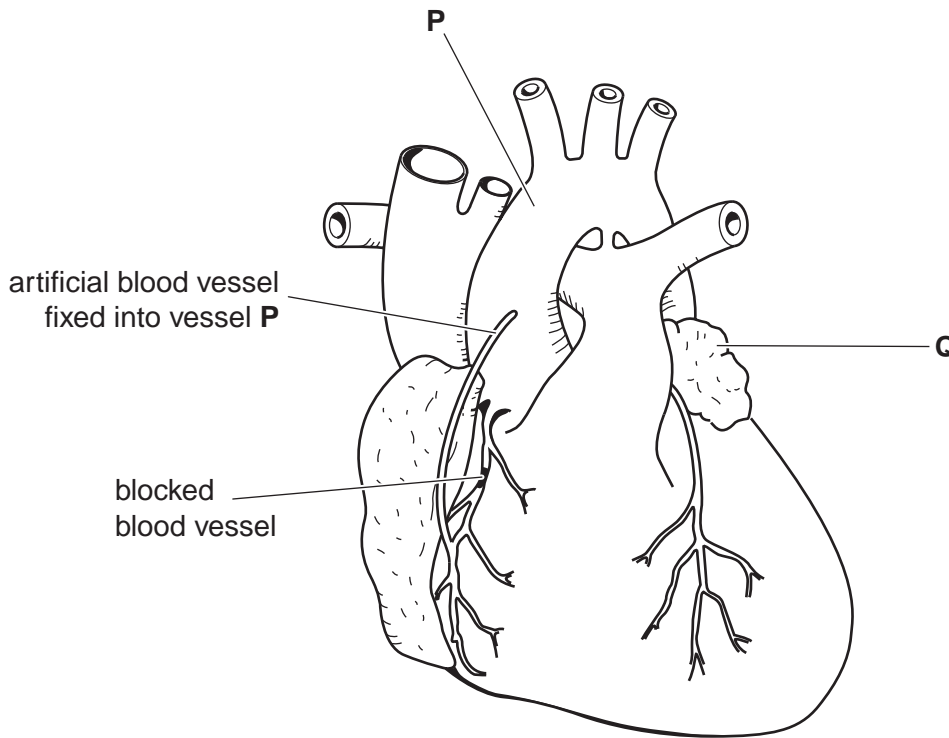


Fig. 3.1

(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'.

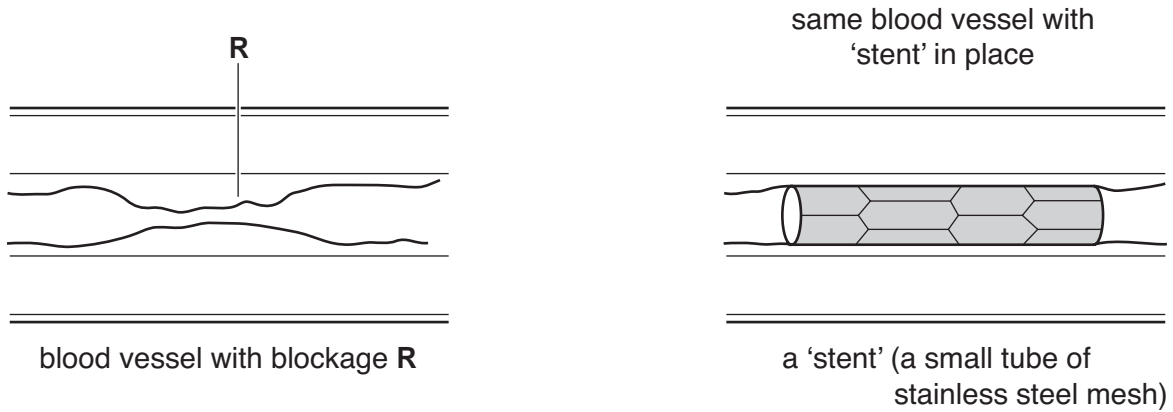


Fig. 3.2

(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.

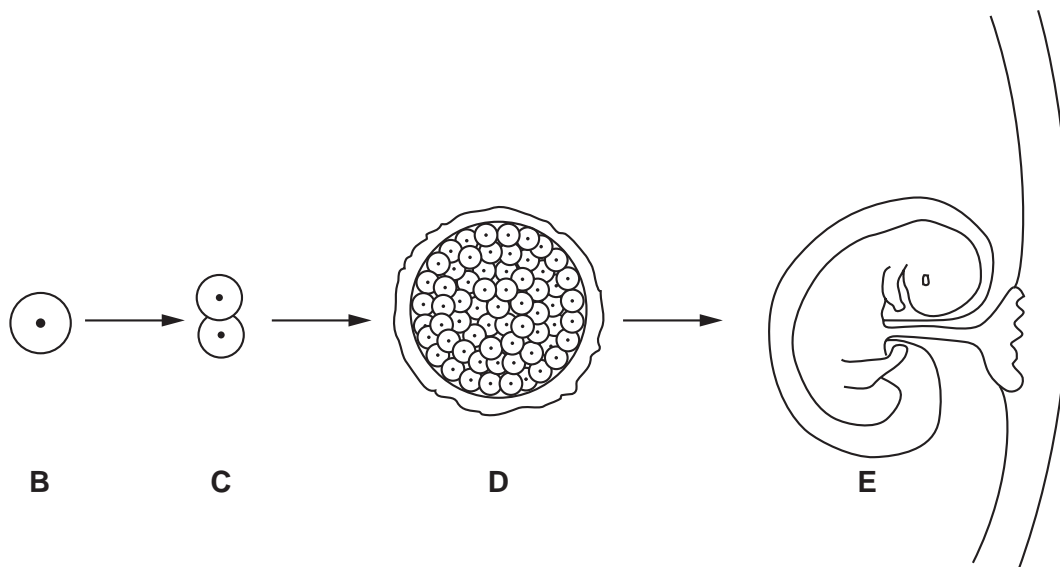


Fig. 5.1

(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.

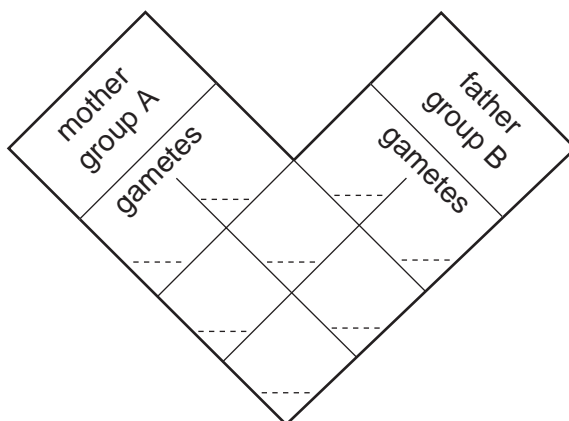
.....[1]

(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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