

Centre Number	Candidate Number	Name
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CAMBRIDGE INTERNATIONAL EXAMINATIONS  
International General Certificate of Secondary Education

**BIOLOGY**

**0610/03**

Paper 3

October/November 2003

**1 hour 15 minutes**

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 any **two** questions.  
Write your answers on the separate answer paper provided.

At the end of the examination,

1. fasten all your work securely together;
2. enter the numbers of the Section B questions you have answered in the grid below.

The number of marks is given in brackets [ ] at the end of each question or part question.

For Examiner's Use	
<b>Section A</b>	
<b>Section B</b>	/
<b>Total</b>	

If you have been given a label, look at the details. If any details are incorrect or missing, please fill in your correct details in the space given at the top of this page.

Stick your personal label here, if provided.

This document consists of **9** printed pages and **3** blank pages.

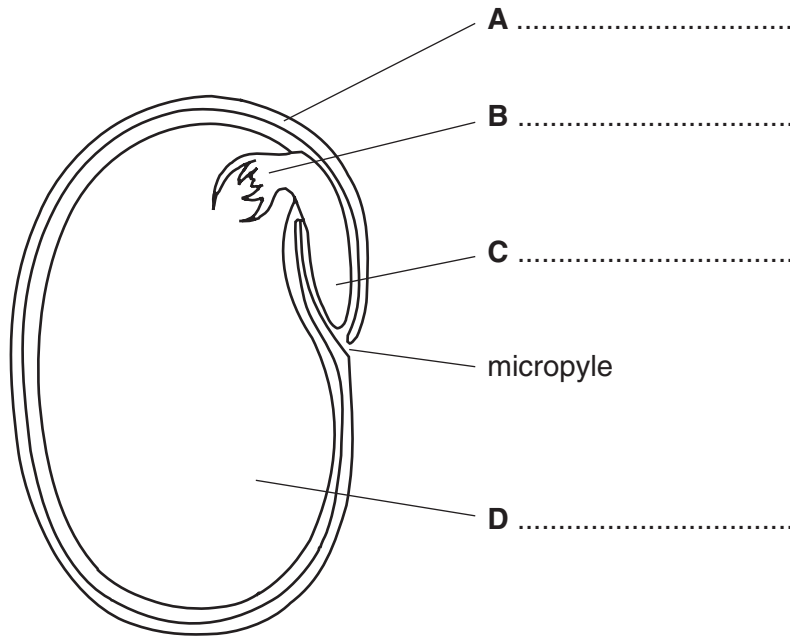


**Section A**

Answer **all** the questions.

Write your answers in the spaces provided.

1 Fig. 1.1 shows a longitudinal section through a broad bean seed.



**Fig. 1.1**

(a) On Fig. 1.1, label parts **A**, **B**, **C** and **D**. [4]

(b) Name the part of the flower in which the seed was formed.  
.....[1]

(c) Broad bean flowers are pollinated by insects such as bees.  
(i) Describe the function of bees in pollination.  
.....  
.....  
.....[2]

(ii) State two structural adaptations you would expect to find in a flower, such as a broad bean, that would attract bees.  
1. ....  
2. ....[2]

(iii) The activity of bees usually results in cross-pollination.  
Explain why cross-pollination may be an advantage to a species of plant.

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

(d) The micropyle is shown on Fig. 1.1.  
Describe the role of the micropyle in

(i) fertilisation;

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

(ii) germination.

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

(e) The carbohydrate stored inside the broad bean seed is mainly starch.

What must happen to the starch before the seed can use it for growth?

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

[Total : 15]

- 2 Table 2.1 shows the total carbohydrate, starch and fibre content of some vegetables.

**Table 2.1**

vegetable	total carbohydrate g / 100 g	starch g / 100 g	fibre g / 100 g
beans	15.1	9.3	3.5
broccoli	1.1	trace	2.3
cabbage	4.1	0.1	2.4
carrots (boiled)	4.9	0.2	2.5
chick peas	18.2	16.6	4.3
onions	3.7	trace	0.7
peas (frozen, boiled)	9.7	4.7	5.1
potato (boiled)	17.0	16.3	1.2
sweet potato (boiled)	20.5	8.9	2.3
tomatoes (raw)	3.1	trace	1.0

- (a) **Name** the chemical elements present in a carbohydrate.

.....[1]

- (b) State which vegetable in Table 2.1 contains

- (i) the highest proportion of total carbohydrate;

.....[1]

- (ii) the highest proportion of fibre.

.....[1]

- (c) Total carbohydrate is calculated as the sum of starch and sugars in the vegetable.

- (i) Name the vegetable that contains the highest proportion of sugar per 100 g vegetable.

.....[1]

- (ii) Calculate the amount of sugar present in 500 g of the vegetable named in (i).  
Show your working.

*Amount of sugar* .....[2]

(d) Potatoes can be cooked in oil (fat) or water.

(i) Suggest and explain how the energy content of the potato would change if cooked in oil.

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

(ii) Suggest why potatoes cooked in water may be considered to be a healthier food than potatoes cooked in oil.

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

(e) 100 g of frozen peas provide 17.0 mg of vitamin C, which represents 25% of the recommended daily allowance (RDA).

(i) Calculate the mass of peas a person would need to eat to achieve the RDA. Show your working.

.....[1]

(ii) Name **one** other good food source of vitamin C.

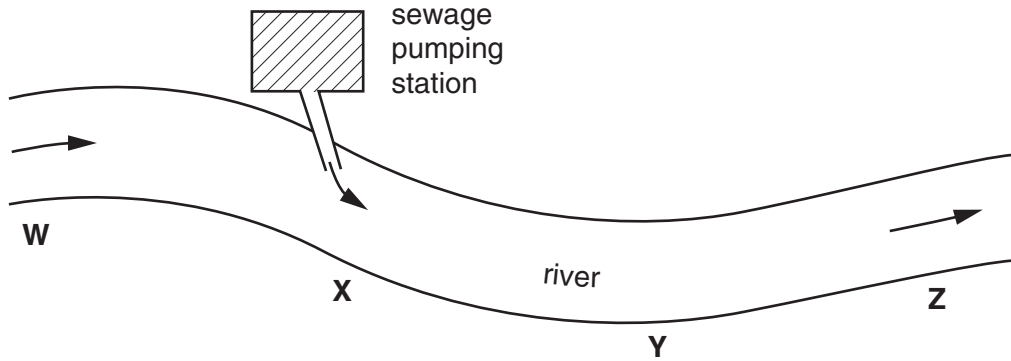
.....[1]

(iii) State the symptoms of a deficiency of vitamin C.

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

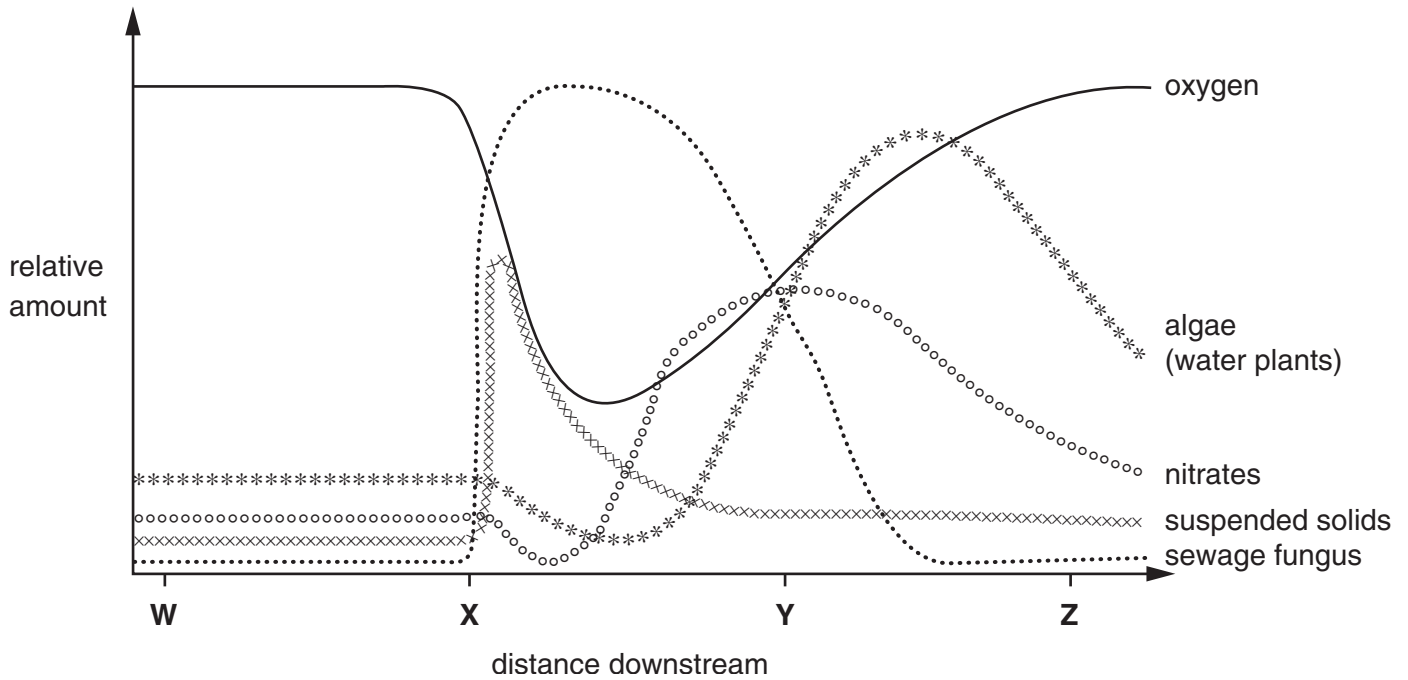
[Total : 14]

- 3 Fig. 3.1 shows part of a river into which sewage is pumped. The river water flows from **W** to **Z**, with the sewage being added at **X**.



**Fig. 3.1**

Some of the effects of adding sewage to the river are shown in Fig. 3.2.



**Fig. 3.2**

- (a) Describe the changes in the levels from **W** to **Z** of

- (i) nitrates;

.....

.....

..... [2]

(ii) suspended solids.

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

(b) Suggest why the level of oxygen

(i) drops at X;

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

(ii) increases again towards Z.

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

(c) Suggest two reasons why levels of algae drop

(i) when sewage is added to the river;

1. ....  
2. ....[2]

(ii) towards Z.

1. ....  
2. ....[2]

(d) A farm at Z used herbicides on the field next to the river.

Suggest why this could cause further problems in the river.

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

[Total : 11]

**Section B**

Answer any **two** questions.

Write your answers on the separate answer paper provided.

4 (a) Describe and explain, with reference to the ribs, intercostal muscles and diaphragm, the process of exhalation (breathing out). [7]

(b) By means of a table with suitable headings, compare the composition of inhaled and exhaled air, stating the reasons for similarities and differences. [8]

[Total : 15]

5 (a) (i) Construct a food chain with **four** named organisms. [3]

(ii) Using appropriate biological terms, describe and explain the flow of energy through your chosen food chain. [8]

(b) With reference to a suitable example for each, outline the need for conservation of

(i) a **named** species  
and

(ii) a **named** habitat. [4]

[Total : 15]

6 (a) Describe the function of the immune system, including antibody production and phagocytosis. [9]

(b) Outline the problems of organ transplantation and how they can be overcome. [6]

[Total : 15]



- 7 (a) With reference to a suitable example, define the term *tissue*. [3]
- (b) Identify parts **A**, **B**, **C** and **D** shown on Fig. 7.1 and describe their main features and functions.

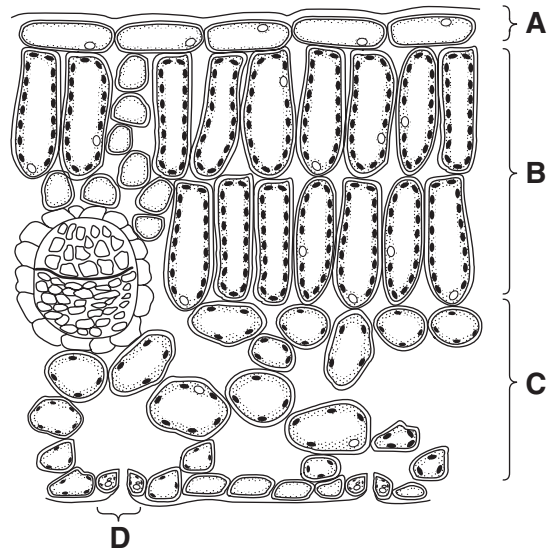


Fig. 7.1

[12]

[Total : 15]





