UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

BIOLOGY **5090/22**

Paper 2 Theory **October/November 2010**

1 hour 45 minutes

Candidates answer on the Question Paper.

No Additional Materials are required.

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 pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

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 in the spaces provided on the Question Paper.
Write an **E** (for Either) or an **O** (for Or) next to the number 8 in the Examiner's 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 **12** printed pages.

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Section A

Answer **all** the questions in this section.

Write your answers in the spaces provided.

1 Fig. 1.1 shows a vertical section through a human heart. The valves have not been shown.

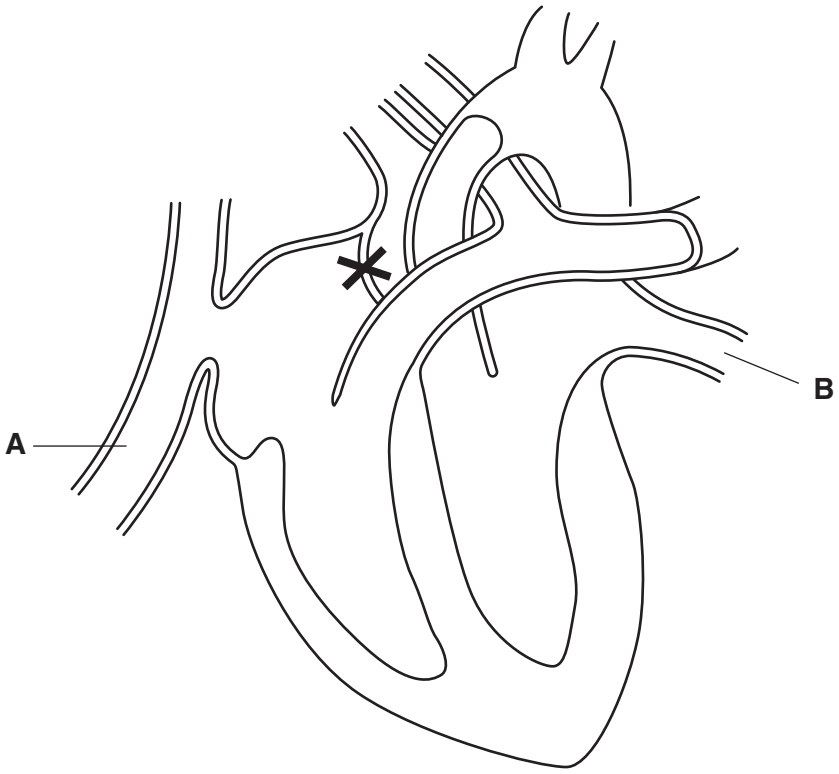


Fig. 1.1

(a) Identify structures **A** and **B** in Fig. 1.1.

A .....

B ..... [2]

(b) Complete Fig. 1.1 by drawing the valves to show how they control the direction of blood flow through the heart. [4]

(c) On Fig. 1.1, draw arrows to show the direction of blood flow into, through and out of the heart. [2]

Some people have a condition known as 'a hole in the heart'. This allows a connection between the left and right atrium at point **X** in Fig. 1.1.

(d) Suggest two problems this might cause.

1. .....

2. .....[2]

[Total: 10]

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2 Similar crops were grown on the same farm over a five-year period.
Fig. 2.1 shows the effect on the number of insects present on the crops when an insecticide is used in each of the five years.

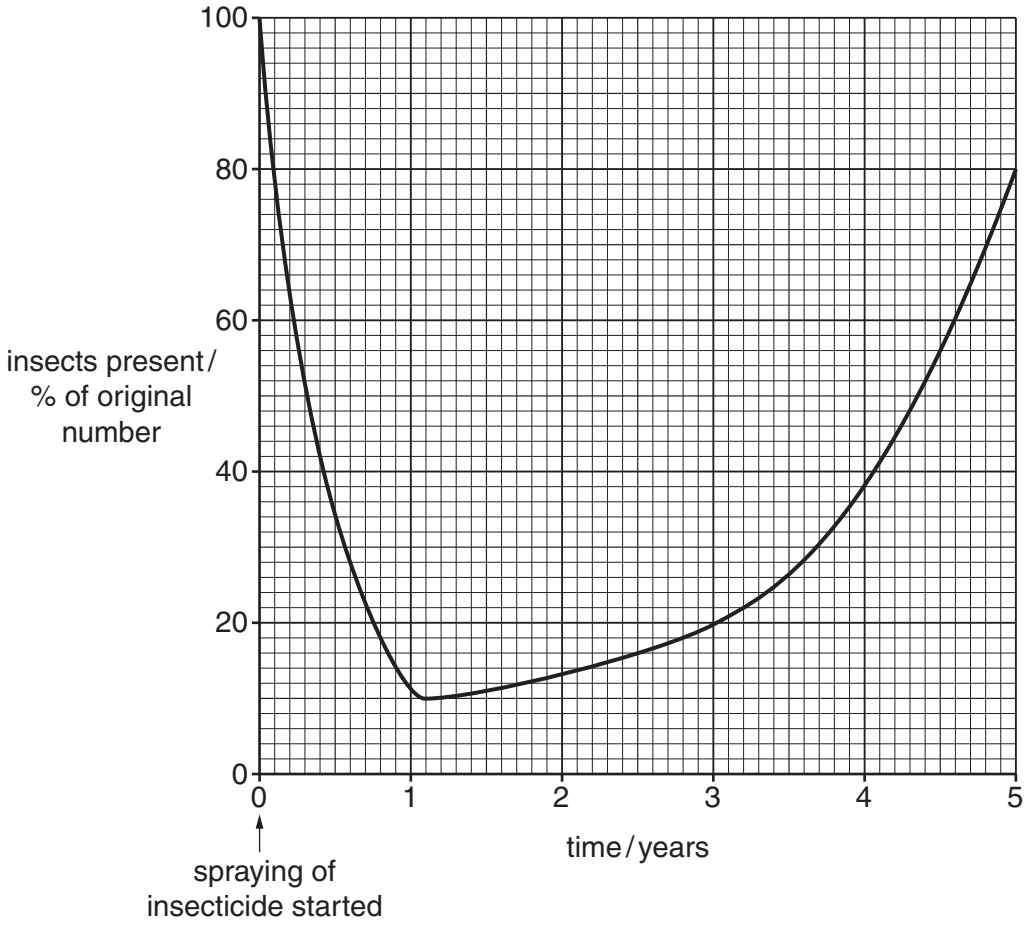


Fig. 2.1

(a) State **one** way an insect might be

(i) helpful to the crops .....

(ii) harmful to the crops. .....[2]

(b) Explain why the percentage of insects began to rise in the second year until almost reaching its original level.

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.....[5]

(c) Suggest three methods of improving the yield from the crops without the use of an insecticide.

1. .....

2. .....

3. .....[3]

[Total: 10]

3 Fig. 3.1 shows a water plant, bladderwort, that lives under water in a small lake. The bladderwort traps then digests small water animals such as water fleas.

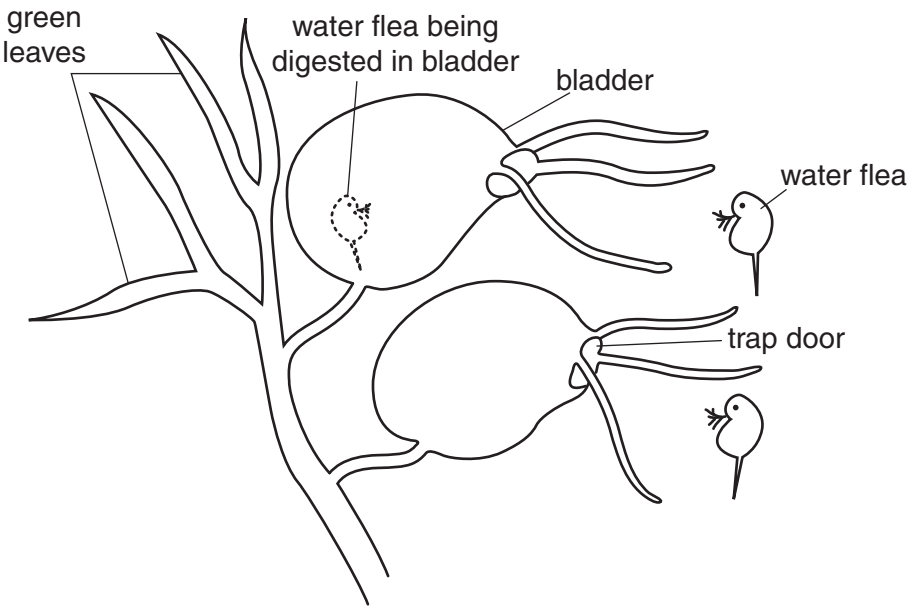


Fig. 3.1

(a) (i) State the process by which the plant is likely to obtain its carbohydrates.

.....[1]

(ii) Suggest how the raw materials for this process are made available to the plant.

.....

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.....[4]

The plant is able to supplement its nitrogen requirements by absorbing products from the digested water fleas.

(b) (i) Name an enzyme the plant must produce in its bladder in order to allow it to carry out this process.

.....[1]

(ii) Name the chemicals absorbed by the bladder after digestion and suggest how the plant uses them.

name .....

use .....

.....[3]

(c) State the form in which nitrogen-containing chemicals are absorbed by a plant growing on land.

.....[1]

[Total: 10]

4 In some tropical plants, such as a mangrove, seeds have already germinated before they leave the parent plant.
Fig. 4.1(a) shows, in section, one of these germinated seeds still attached to the stem of its parent.
Fig. 4.1(b) shows a growing seedling after it has left the parent plant.

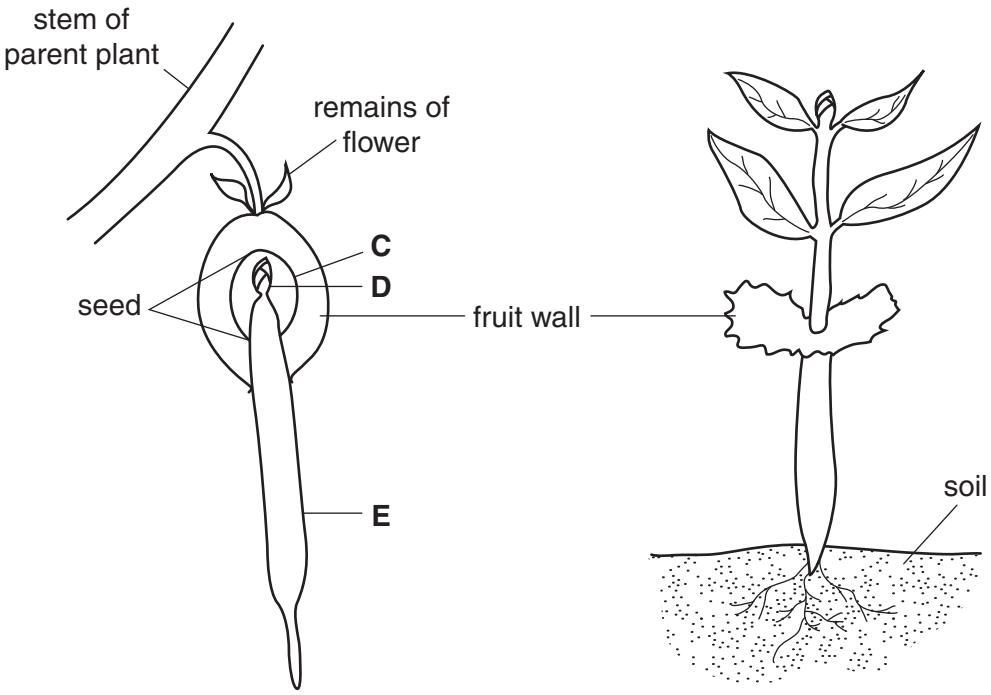


Fig. 4.1(a) **Fig. 4.1(b)**

(a) (i) Identify the structures **C** and **D** in Fig. 4.1(a).

C .....

D ..... [2]

(ii) State the part of the embryo from which structure **E** has developed.

.....[1]

(b) The air temperature is suitable for germination of the seed on the parent plant. Suggest how the embryo obtains the **other** requirements for germination.

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.....[4]

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(c) Suggest and explain how the genetic make-up of the seedling compares with that of the parent plant.

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.....[4]

[Total: 11]

5 Fig. 5.1 shows a computerised image taken through the thorax (chest) of a person lying on their back.

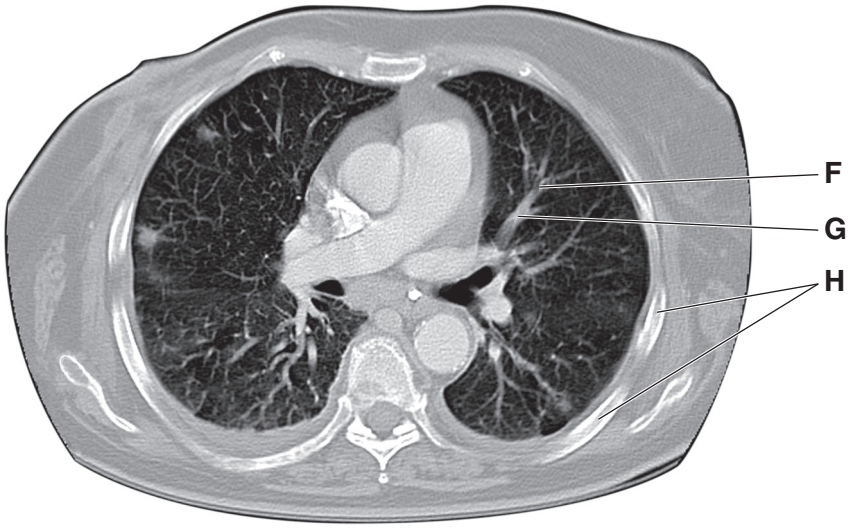


Fig. 5.1

(a) Draw a line on Fig. 5.1 to show the position of the chest wall if the person breathes in deeply. [1]

(b) Identify the structures **F**, **G**, **H** in Fig. 5.1.

F .....

G .....

H ..... [3]

(c) Explain the part played by structures **H** when the person breathes in.

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.....[5]

[Total: 9]

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Section B

Answer **all** the questions, including questions 6, 7 and 8 **Either** or 8 **Or**.

Write your answers in the spaces provided.

6 **(a)** Explain what is meant by a *hormone*.

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.....[4]

(b) Give an example of a hormone and describe how it is involved in maintaining constant conditions within the human body.

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.....[6]

[Total: 10]

7 **(a)** Describe the characteristics of bacteria.

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.....[4]

(b) Explain how bacteria can be used in biotechnology to manufacture a useful product.

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.....[6]

[Total: 10]

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8 **Either** Using an example to illustrate each process, describe how substances move into and out of cells.

....[10]

[Total: 10]

8 Or Describe how a developing fetus in the uterus obtains and uses its metabolic requirements and gets rid of its waste products.

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[Total: 10]

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Fig. 5.1 Neil Borden; Science Photo Library.

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