



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE
NAME

CENTRE
NUMBER

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BIOLOGY

0610/22

Paper 2 Core

May/June 2011

1 hour 15 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 or graphs.

Do not use staples, paper clips, highlighters, glue or correction fluid.

DO NOT WRITE IN ANY BARCODES.

Answer **all** questions.

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 | |
|--------------------|--|
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Total | |

This document consists of **14** printed pages and **2** blank pages.



1 A remote-controlled submarine gathered a sample of mud from the bottom of the sea.

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Fig. 1.1 shows an apparatus that was set up to investigate if the mud contained any living organisms.

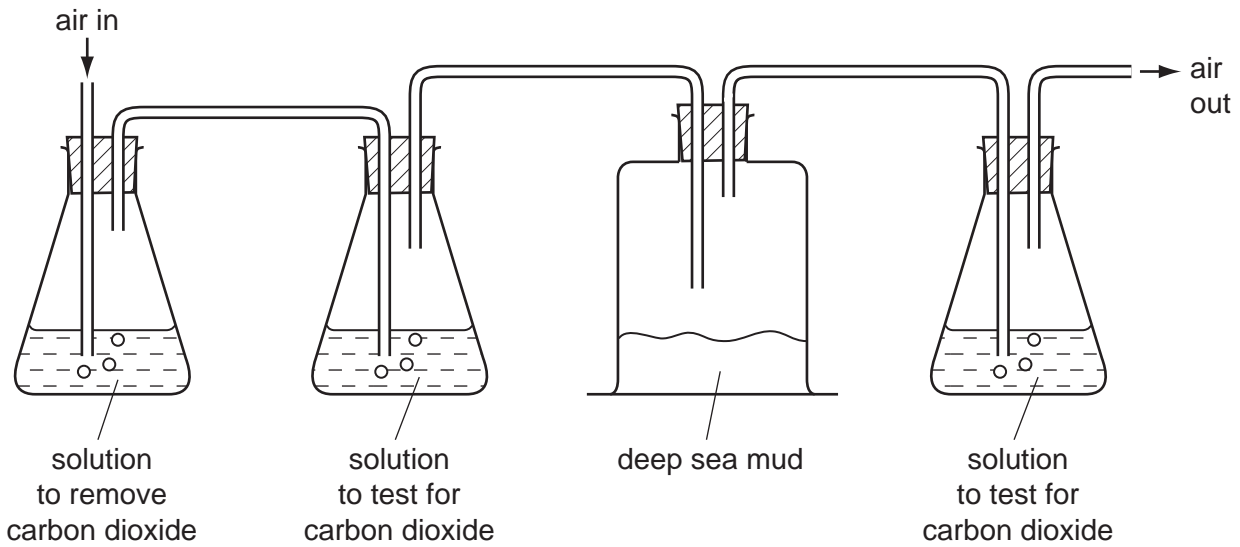


Fig. 1.1

(a) (i) Name a solution that could be used to test for carbon dioxide.

..... [1]

(ii) Carbon dioxide was detected coming from the mud.

Suggest the two characteristics of living organisms that could be linked to this observation.

1.
2. [2]

(b) List three other characteristics of living organisms.

1.
2.
3. [3]

[Total: 6]

2 (a) Table 2.1 gives the daily energy requirements of some different people.

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Table 2.1

| activity of 25 year old adult | daily energy requirement / kJ |
|-------------------------------|-------------------------------|
| very active male | 14 700 |
| average male | 11 550 |
| breastfeeding female | 11 300 |
| average female | 9450 |

(i) Suggest **two** reasons for the difference in energy needed by the average female and the average male in Table 2.1.

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

(ii) Suggest an explanation for the difference in energy needed by the average female and the breastfeeding female in Table 2.1.

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

(b) Table 2.2 gives the daily protein requirements of some different people.

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Table 2.2

| person | age / years | daily protein requirement / g |
|----------------------|-------------|-------------------------------|
| pregnant female | 25 | 85 |
| breastfeeding female | 25 | 100 |
| average female | 25 | 64 |
| male | 11 - 15 | 70 |
| female | 11 - 15 | 58 |

(i) Suggest explanations for the difference in the protein needs shown in Table 2.2, of the average female compared with the pregnant female and the breastfeeding female.

.....

.....

.....

.....

.....

.....

..... [3]

(ii) Suggest **two** reasons for the difference in protein needed by a male aged 11 – 15 years compared with a female of the same age in Table 2.2.

.....

.....

.....

..... [2]

(c) The average female needs a higher iron intake in her diet than the average male. Suggest a reason for this.

.....

..... [1]

[Total: 10]

3 (a) Fig. 3.1 shows a section through the skin.

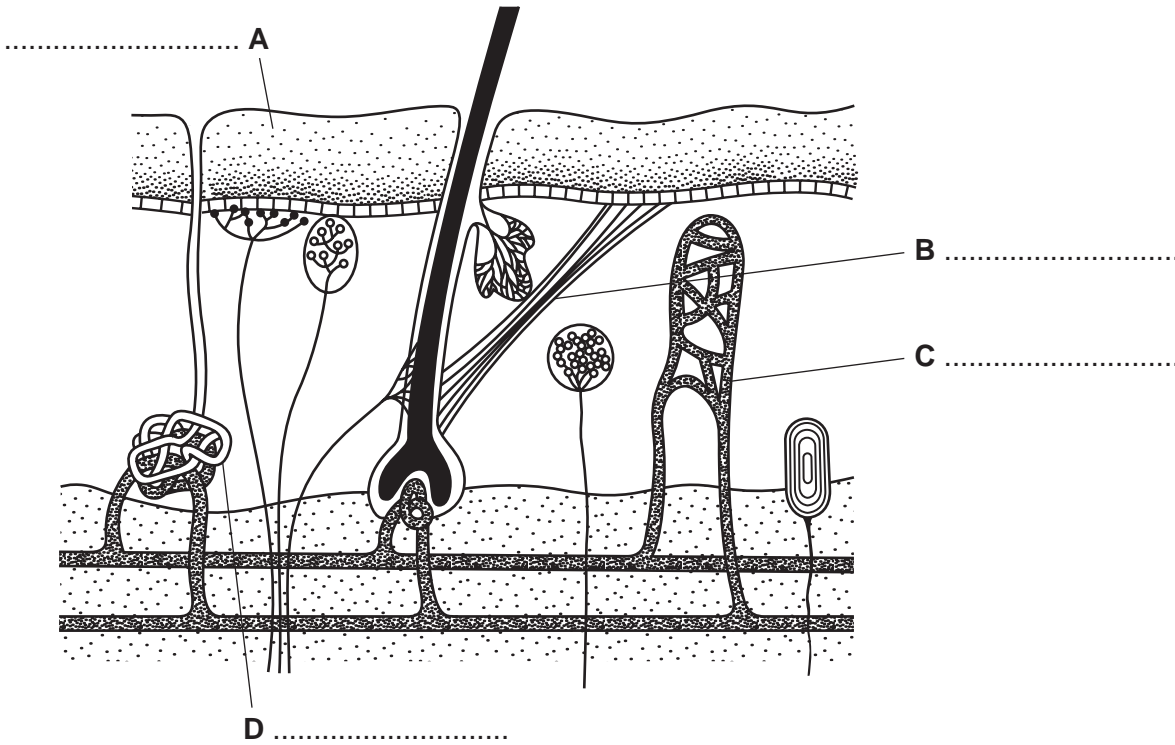


Fig. 3.1

(i) On Fig. 3.1 label structures A, B, C and D.

Write your answers on Fig. 3.1. [4]

(ii) State two types of stimuli that the skin is able to detect.

- 1.
- 2. [2]

(b) Explain how sweat glands assist in the control of body temperature.

.....

.....

.....

.....

.....

..... [3]

[Total: 9]

4 Fig. 4.1 shows a section through the female reproductive and other systems.

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Use

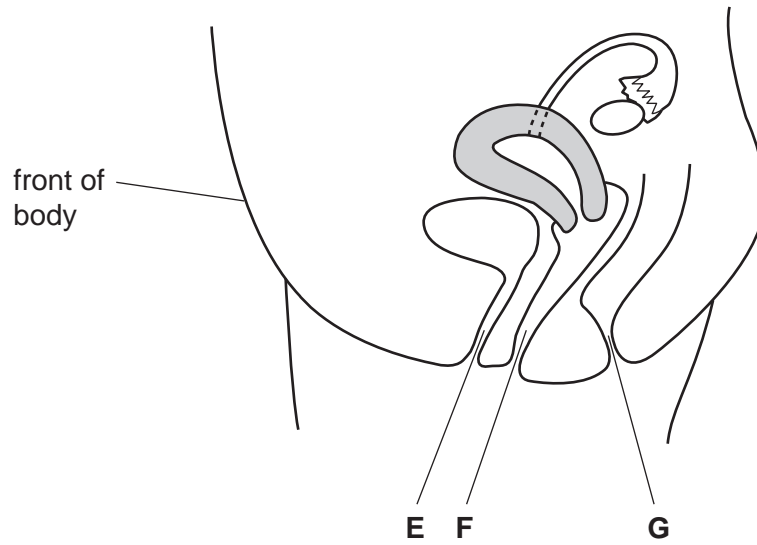


Fig. 4.1

(a) (i) Name the structures labelled **E**, **F** and **G**.

E

F

G [3]

(ii) Explain the roles of the ovaries and the oviducts in reproduction.

ovaries

.....

.....

.....

oviducts

.....

.....

..... [4]

(b) Humans use a variety of methods of birth control.

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(i) State what has to be carried out in the body of a female to surgically sterilise her.

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

(ii) Another method of birth control is the femidom that may prevent pregnancy. State what else may be prevented by using the femidom.

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

(iii) Name and explain **one** chemical method of birth control.

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

[Total: 11]

5 (a) Two types of variation, continuous and discontinuous, occur in living organisms.

Complete Table 5.1 about the two types of variation.

For
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Use

Table 5.1

| | continuous variation | discontinuous variation |
|----------------------------------|----------------------|-------------------------|
| example of variation in humans | | |
| factors that influence variation | | |

[4]

(b) State the meaning of the terms *gene* and *allele*.

gene

.....

allele

..... [2]

(c) Nuclei can be diploid or haploid.

Compare these **two** types of nuclei.

.....

.....

.....

.....

.....

..... [3]

[Total: 9]

6 Calcium ions are cycled in ecosystems.

Fig. 6.1 represents a calcium cycle.

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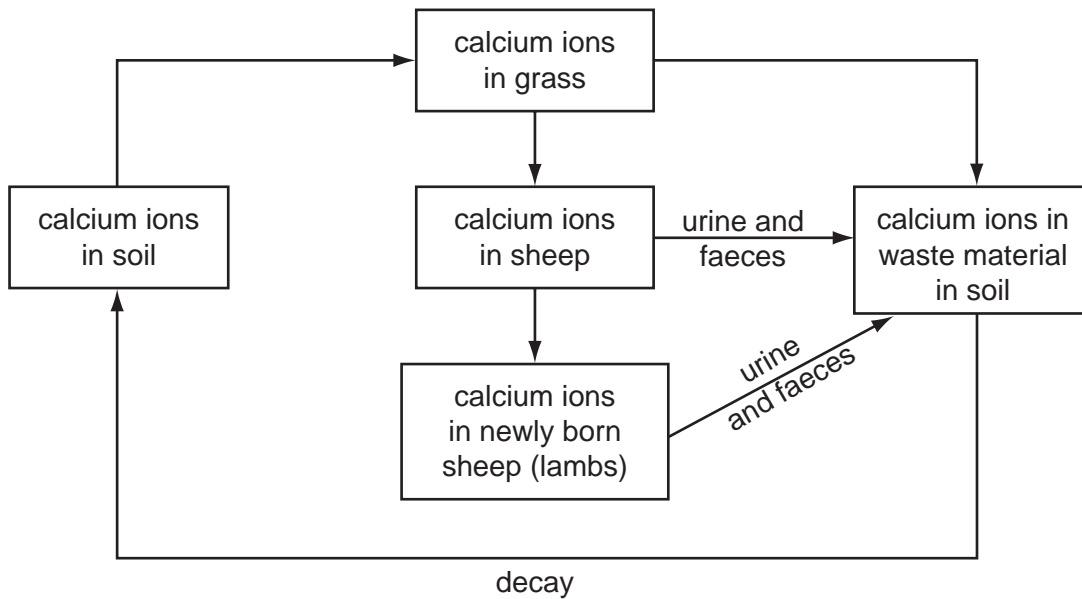


Fig. 6.1

- (a) (i) In the root of a plant, the concentration of calcium ions is lower than the concentration in the surrounding soil.

Name the process by which calcium ions pass into the grass root cells.

..... [1]

- (ii) Name the tissue that transports calcium ions to the leaves of the grass plants.

..... [1]

- (b) Calcium ions are absorbed with digested food. They are then used in a similar way in sheep and humans.

- (i) Suggest where the calcium ions are absorbed into the blood of a sheep.

.....

 [2]

- (ii) Name the vitamin that is needed for a sheep to use the calcium ions, preventing rickets.

..... [1]

(iii) Identify **one** tissue in which the sheep uses the calcium ions.

..... [1]

(iv) Suggest how the calcium ions are passed from the sheep to its lamb.

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

(c) Chemical energy is stored in the grass. The amount of energy passed from the grass to the sheep is greater than the energy passed from the sheep to its lamb.

Suggest reasons for this difference.

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

[Total: 11]

7 Fig. 7.1 shows a photograph of a section through a leaf.

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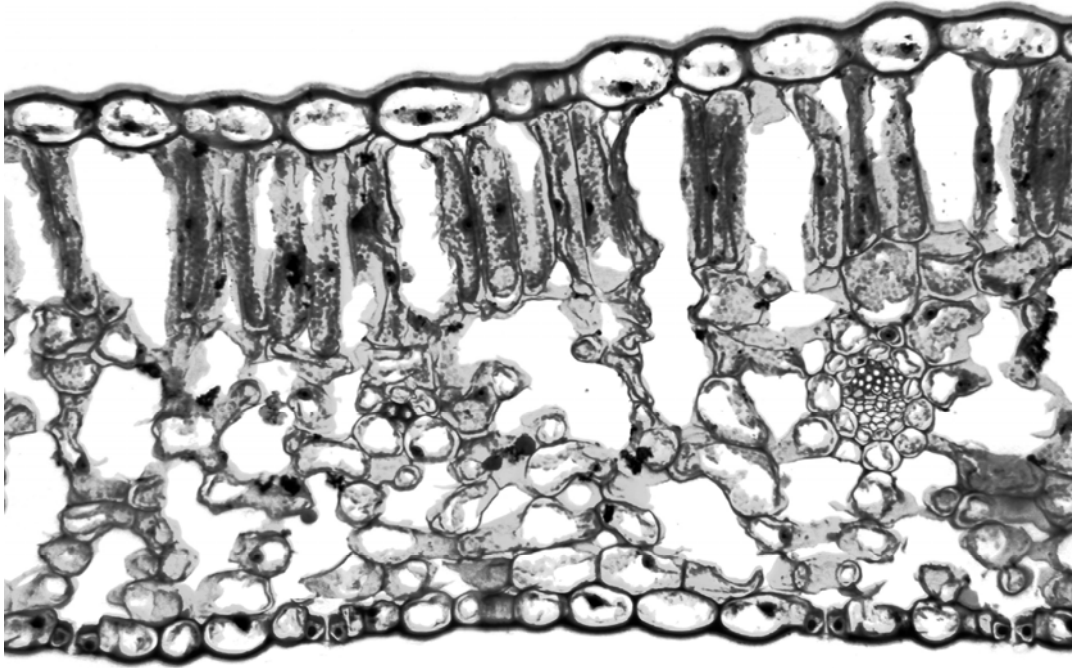


Fig. 7.1

(a) (i) Explain the functions of the cuticle of a leaf.

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

(ii) Explain how carbon dioxide in the atmosphere passes to the cells inside the leaf.

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

(b) The cells in the leaf use carbon dioxide to carry out photosynthesis.

State two environmental factors, apart from carbon dioxide, that can affect the rate of photosynthesis.

1.
2. [2]

[Total: 6]

8 Fig. 8.1 shows a food web of a community living in a Caribbean ecosystem.

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Use

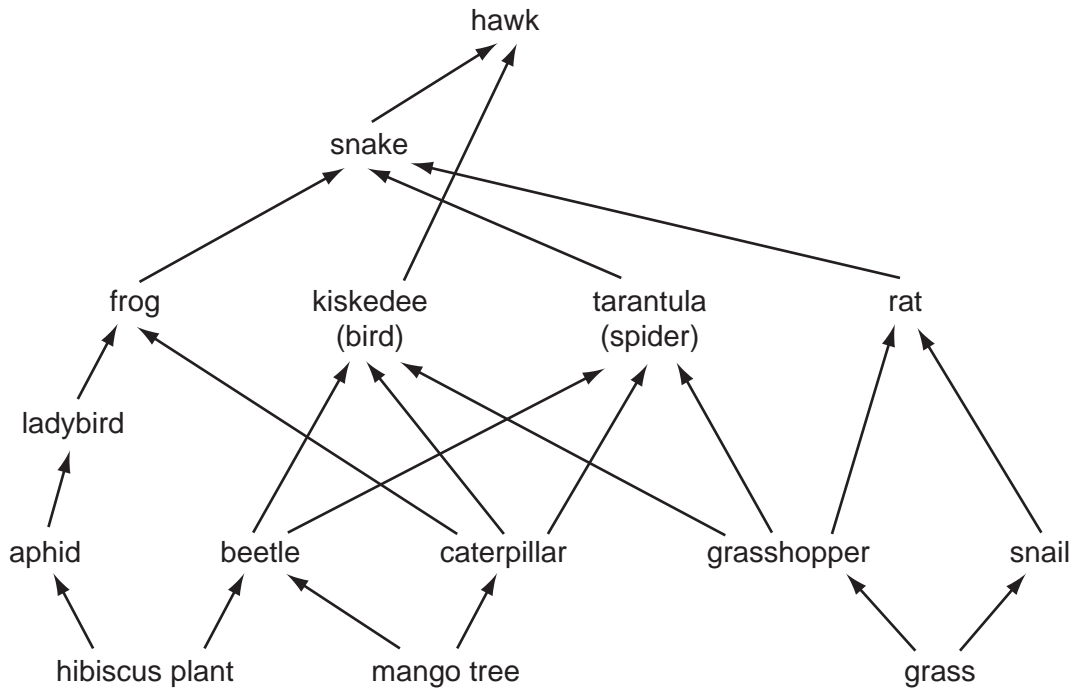


Fig. 8.1

(a) (i) Explain the term *ecosystem*.

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

(ii) Explain the difference between a producer and a consumer.

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

(b) Using information in Fig. 8.1 construct a complete food chain of **only five** organisms. The food chain **must** include the hawk.

For
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Use

[3]

(c) In the past the mango trees were sprayed with a very powerful insecticide. The insecticide destroyed the beetles and caterpillars that damaged the crop.

Predict and explain the effect on the snake population of the loss of the beetles and caterpillars.

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.....

[4]

(d) Suggest two other effects of the use of powerful insecticides.

1.
.....
2.
.....

[2]

[Total: 13]

9 There are many people in the world who are not able to digest lactose, a sugar in milk produced by cows, goats and sheep. These people do not make the enzyme lactase that breaks down lactose in the small intestine.

(a) Describe what is meant by the term *enzyme*.

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

(b) People who cannot digest lactose sometimes drink a liquid containing the enzyme lactase before they eat food containing milk products.

The aim of this treatment is to digest any lactose in the food, but it is not likely to be successful.

Suggest why this treatment is **not** likely to be successful.

.....
.....
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.....
..... [3]

[Total: 5]

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