UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

2439575101

BIOLOGY **0610/21**

Paper 2 Core **May/June 2010**

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.

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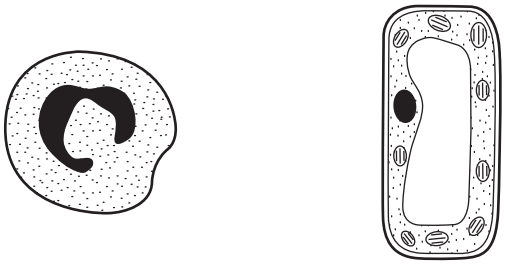
1	
2	
3	
4	
5	
6	
7	
8	
9	
Total	

This document consists of **15** printed pages and **1** blank page.

UNIVERSITY of CAMBRIDGE International Examinations

For Examiner's Use

1 Fig. 1.1 shows two cells.



cell **A** cell **B**

Fig. 1.1

(a) (i) State where, in a human, a cell of type **A** would normally be found.

..... [1]

(ii) State where, in a plant, a cell of type **B** would be found.

..... [1]

(b) Use only words from the list to complete the statements about cell **B**.

air	**cellulose**	**chloroplasts**	**membrane**	**mitochondria**
nucleus	**starch**	**vacuole**	**wall**	**cell sap**

Cell **B** has a thick outer layer called the cell ..... . This is made of ..... . The cytoplasm of cell **B** contains many ..... that are used in the process of photosynthesis. The large permanent ..... is full of ..... and this helps to maintain the shape of the cell.

[5]

(c) Fig. 1.2 shows structures that produce urine and excrete it from the body of a mammal.

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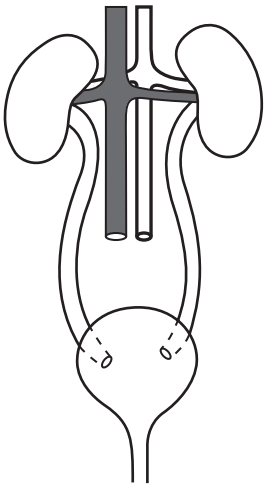

Fig. 1.2

(i) On Fig. 1.2, label and name **one** organ. [1]

(ii) Use examples from Fig. 1.2 to explain the difference between the terms *organ* and *organ system*.

.....

.....

.....

..... [3]

[Total 11]

2 Table 2.1 shows some of the external features of the five classes of vertebrates.

Complete the table by placing a tick (✓) to indicate if each class has the feature.

Table 2.1

class of vertebrate	external ear flap	feathers or fur	scaly skin	two pairs of limbs
amphibians				
birds				
fish				
mammals				
reptiles				

[5]

[Total: 5]

3 Rain forests are the natural vegetation in areas with high rainfall.

Tropical rain forest is being cut down in many parts of the world to clear land for agriculture. The soil of the rain forest allows water to drain through it very rapidly.

Table 3.1 shows the yield of cotton crops, grown under three different conditions, on land cleared of rain forest.

Table 3.1

	yield of cotton / kg per hectare		
years since the forest was cleared	no fertiliser added to the soil	fertiliser added to soil during year 1	chopped grass added to the soil during year 1
1	200	398	220
2	180	790	1460
3	120	700	980

(a) (i) What happened to the yield of cotton over the three years if no fertiliser was added to the soil?

.....

..... [1]

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(ii) Suggest possible reasons for this change in the yield of cotton.

.....

.....

..... [2]

(b) (i) What happened to the yield of cotton when fertiliser was added to the soil in year 1?

.....

..... [1]

(ii) Suggest why excessive quantities of fertiliser should not be added to the soil.

.....

.....

.....

..... [2]

(c) Chopped grass added to the soil has little effect on the crop yield in year 1. Suggest why it has much greater effect on the yield in years 2 and 3.

.....

.....

.....

..... [2]

[Total: 8]

4 Fig. 4.1 shows a pyramid of biomass.

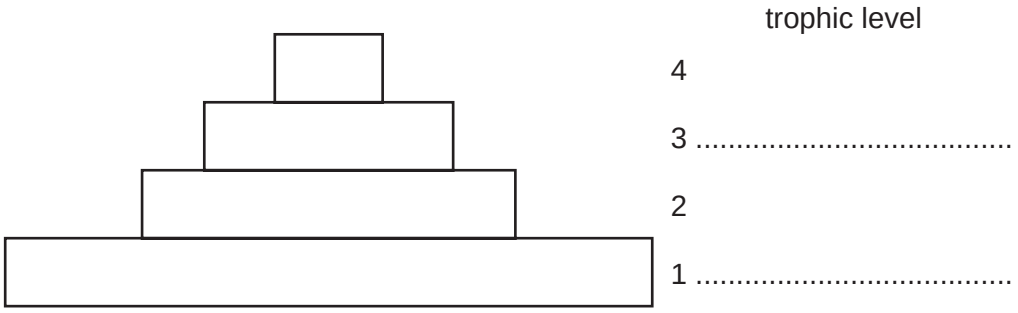

Fig. 4.1

(a) On Fig. 4.1, name trophic levels 1 and 3. [2]

(b) Fig. 4.2 shows a food web of a freshwater pond and Fig. 4.3 shows the same pyramid of biomass as was shown in Fig. 4.1.

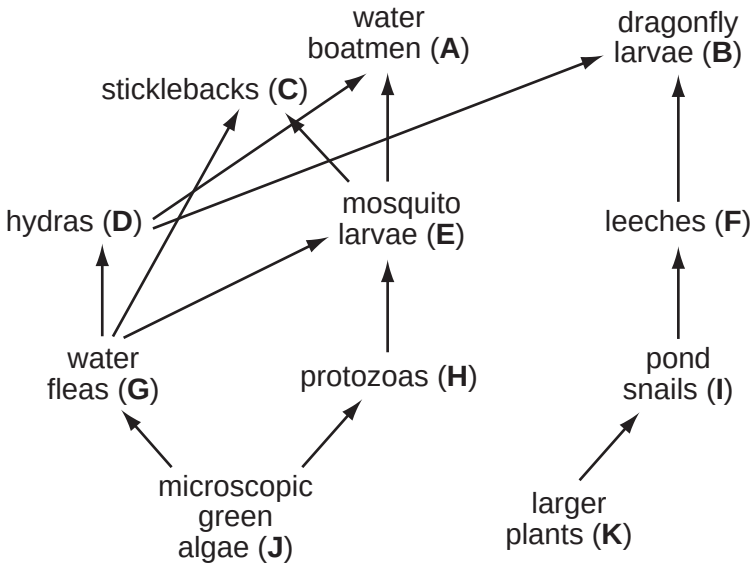

Fig. 4.2

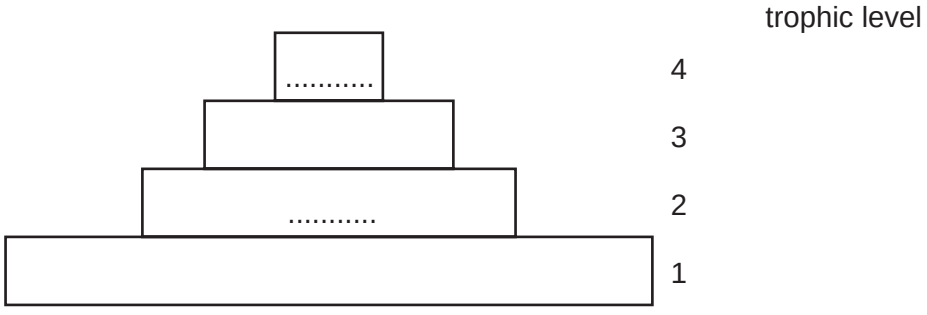

Fig. 4.3

(i) In the boxes for trophic levels **2** and **4** in Fig. 4.3, write the letters (**A** to **K**) of all the organisms that are members of these trophic levels. [2]

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(ii) An outbreak of a bacterial disease that affects only mosquito larvae occurred in the pond. Predict and explain **two** of the effects this might have on the hydra population.

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.....

.....

.....

.....

.....

..... [4]

[Total: 8]

5 Fig. 5.1 shows an experiment to investigate the conditions needed for germination.

Tubes **A**, **B**, **C** and **D** are at room temperature and tube **E** is in a freezer.

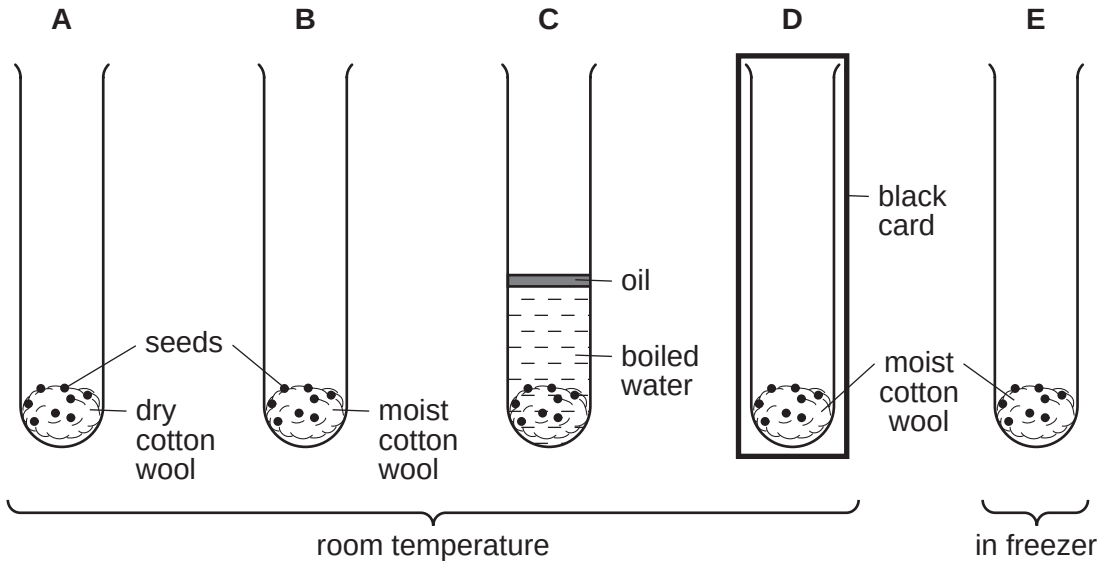

Fig. 5.1

(a) State three of the environmental conditions this experiment is investigating.

1. .....

2. .....

3. ..... [3]

(b) Predict in which **two** tubes the seeds will germinate.

..... [2]

(c) Nuclear and cell division happen during germination.

(i) Name the type of nuclear division that takes place during the growth of a seedling.

..... [1]

(ii) State how the number of chromosomes in each of the new cells compares with the number of chromosomes in the original cells.

..... [1]

(d) Fig. 5.2 shows the changes in the dry mass of a broad been seed in the first five days after planting.

For Examiner's Use

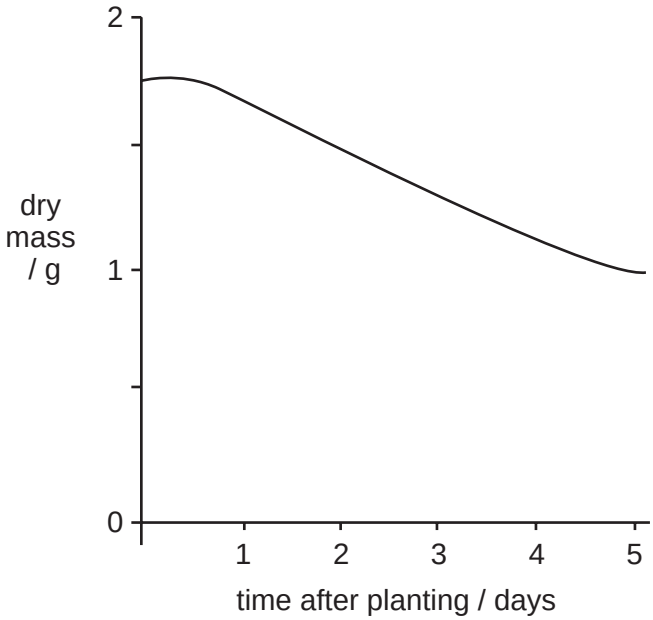

Fig. 5.2

Describe and suggest an explanation for the changes that happen to the dry mass of the seed in the first five days after planting.

.....

.....

.....

..... [3]

[Total: 10]

6 Fig. 6.1 shows a fetus developing inside the uterus.

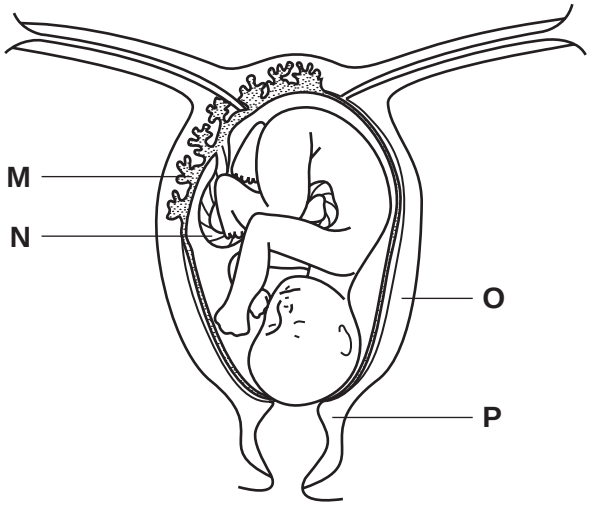

Fig. 6.1

(a) The fetus developed from a fertilised egg cell. Place an **X** on the diagram where an egg cell is normally fertilised. [1]

(b) **(i)** Name the structures **M** and **N**.

M .....

N ..... [2]

(ii) Describe the role of structure **M** in gaseous exchange.

.....

.....

.....

..... [3]

(c) Describe how the structures labelled **O** and **P** are involved in the birth of the baby.

structure **O** .....

.....

structure **P** .....

..... [2]

(d) (i) If a woman infected with HIV becomes pregnant, her baby may also be infected with HIV, by the time it is born.

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Suggest **two** ways this may happen.

.....

.....

..... [2]

(ii) Apart from avoiding infections, describe two other ways that a pregnant mother can help her baby develop healthily.

1. .....

.....

2. .....

..... [2]

[Total: 12]

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7 Fig. 7.1 shows three different types of teeth from a human.

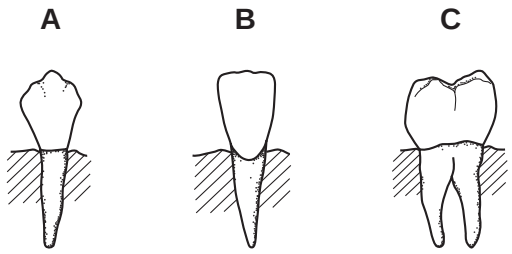

Fig. 7.1

(a) (i) Name the types of teeth labelled **A** and **B**.

A .....

B ..... [2]

(ii) State where in the jaw tooth type **C** is found.

..... [1]

(b) Explain how regular brushing helps to prevent tooth decay.

.....

.....

.....

.....

..... [3]

(c) Explain the roles of chewing and of enzymes in the process of digestion.

.....

.....

.....

.....

..... [4]

[Total: 10]

[Turn over

8 Fig. 8.1 shows the route taken by blood around the body.

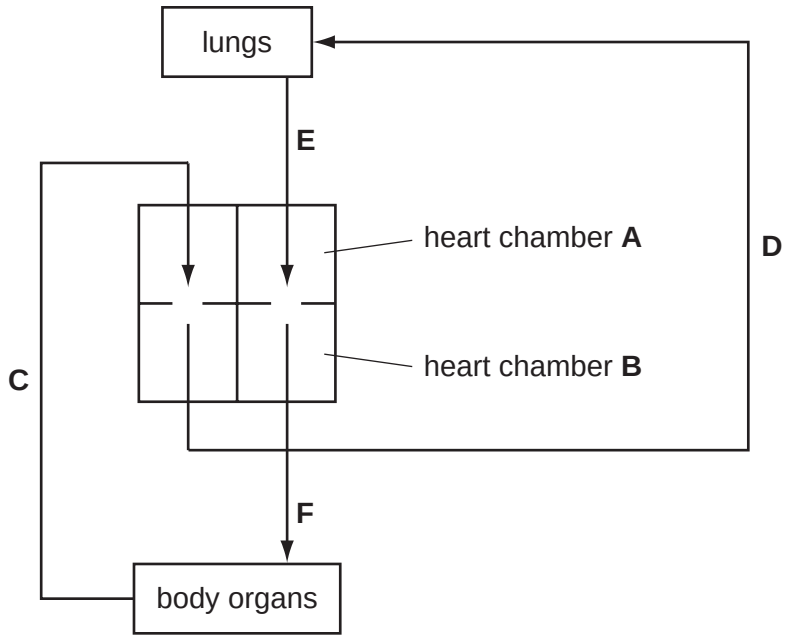

Fig. 8.1

(a) (i) Name the heart chambers **A** and **B**.

A .....

B ..... [2]

(ii) Use information shown in Fig. 8.1 to identify the type of blood vessel **C** as either an artery or a vein.

type of vessel .....

reason .....

..... [2]

(b) (i) State and explain two differences between the contents of the blood flowing in vessels **C** and **E**.

1. .....

.....

2. .....

..... [2]

(ii) Suggest and explain which of the four blood vessels contains blood at the highest pressure.

.....

.....

..... [2]

[Total: 8]

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9 **(a)** Name two human sense organs and an environmental stimulus that each detects.

sense organ 1 .....

stimulus it detects .....

sense organ 2 .....

stimulus it detects ..... [2]

(b) **(i)** Tropisms occur in plants. State the meaning of the term *tropism*.

.....

.....

..... [2]

(ii) Complete Table 9.1 about tropisms in plants.

Table 9.1

stimulus	name of tropism	effect on plant shoot
gravity		
light		

[4]

[Total: 8]