UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

BIOLOGY **0610/02**

Paper 2 Core **May/June 2009**

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 **17** printed pages and **3** blank pages.

1 Fig.1.1 shows six arthropods, each of which could carry disease organisms.

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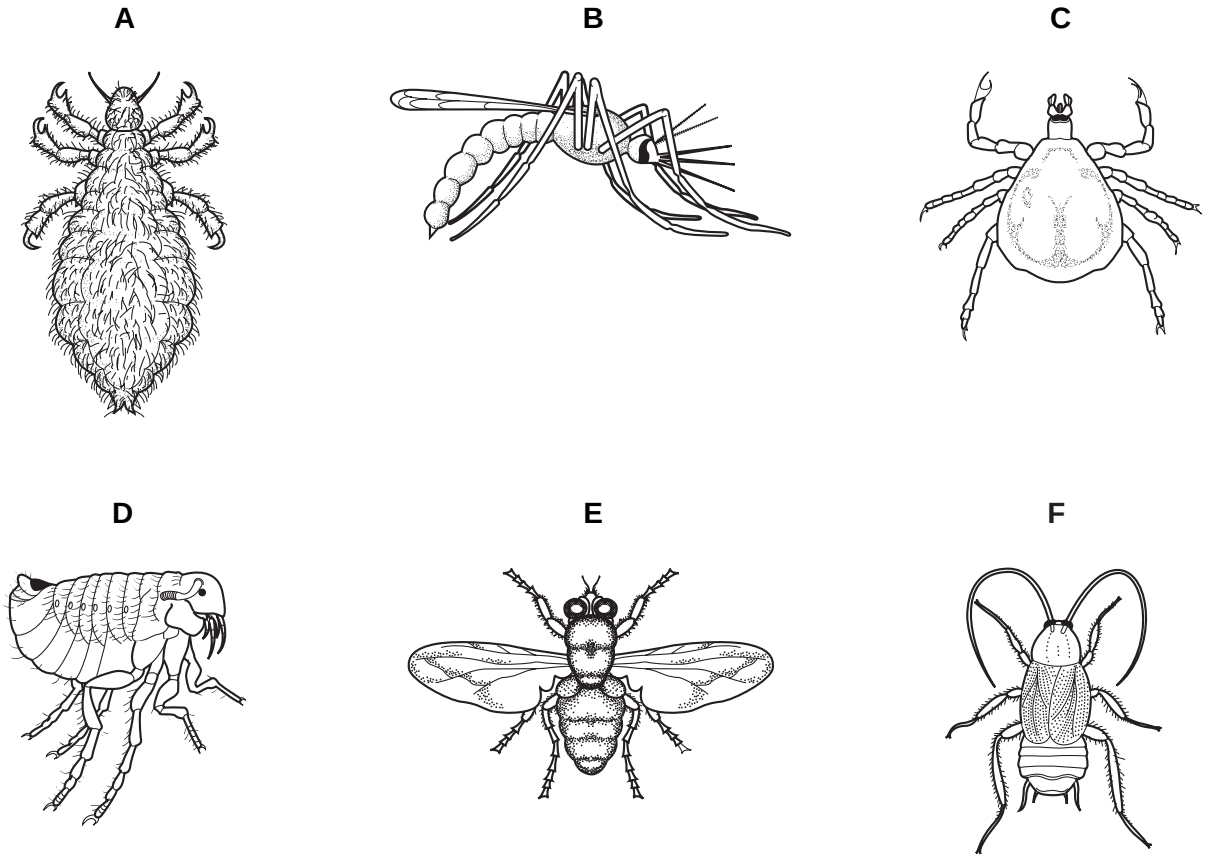

Fig. 1.1

Use the key to identify each of the arthropods. Write the name of each arthropod in the correct box of Table 1.1. As you work through the key, tick (✓) the boxes in Table 1.1 to show how you identified each arthropod.

Arthropod **A** has been completed for you as an example.

Key

	arthropod
1 (a) Wings present …….....	go to 2
(b) Wings absent ……..	go to 4
2 (a) Wings shorter than abdomen ……	go to 3
(b) Wings longer than abdomen …….	Musca
3 (a) Abdomen long and narrow ……	Anopheles
(b) Abdomen short and broad …….	Periplaneta
4 (a) Has three pairs of legs ……..	go to 5
(b) Has four pairs of legs …….	Ornithodorus
5 (a) One pair of legs shorter than the other pairs ….	Pulex
(b) All pairs of legs of similar length ……..….	Pediculus

Table 1.1

	1 (a)	1 (b)	2 (a)	2 (b)	3 (a)	3 (b)	4 (a)	4 (b)	5 (a)	5 (b)	name of arthropod
A		✓					✓			✓	*Pediculus*
B											
C											
D											
E											
F											

[5]

[Total: 5]

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For Examiner's Use

2 **(a)** Why do most waste products of metabolism have to be removed from the body?

.....

[1]

(b) Fig.2.1 shows the human excretory system.

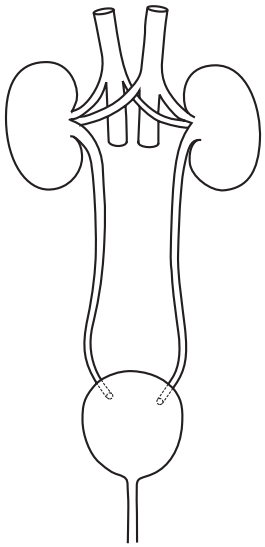

Fig. 2.1

Name the parts that fit each of the following descriptions.

(i) The tube that carries urine from the kidneys.

.....

[1]

(ii) The organ that stores urine.

.....

[1]

(iii) The blood vessel that carries blood away from the kidney.

.....

[1]

(c) Outline how the kidneys remove only waste materials from the blood.

.....

.....

.....

.....

[3]

For Examiner's Use

(d) Excess amino acids cannot be stored in the body and have to be broken down.

(i) Where are excess amino acids broken down?

..... [1]

(ii) Which waste chemical is formed from the breakdown of excess amino acids?

..... [1]

[Total: 9]

For Examiner's Use

3 **(a)** Sexual reproduction in flowering plants involves both pollination and fertilisation.

(i) Explain the difference between pollination and fertilisation.

.....

.....

.....

.....

..... [3]

(ii) Name the part of a flower where pollination happens.

..... [1]

(iii) Name the part of a flower where fertilisation happens.

..... [1]

(b) Sexual reproduction in flowers results in the production of seeds and fruits. From which part of a flower is each of these formed?

seed .....

fruit ..... [2]

(c) Describe the role of the wind in the life cycle of some flowering plants.

.....

.....

..... [2]

[Total: 9]

For Examiner's Use

4 Fig. 4.1 shows the water cycle.

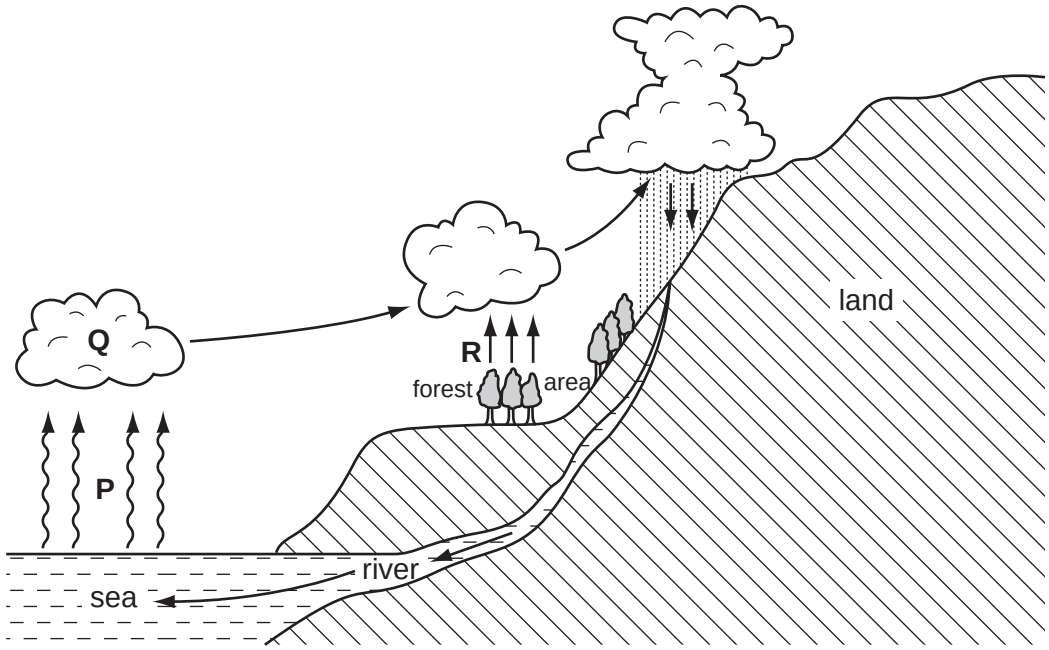

Fig. 4.1

(a) (i) The arrows labelled **P** represent evaporation. Which type of energy is needed for this process?

..... [1]

(ii) State what causes the formation of clouds at **Q**.

.....

..... [1]

(b) (i) What process is represented by the arrows labelled **R**?

..... [1]

(ii) Name three factors that could alter the rate at which process **R** happens.

1. .....

2. .....

3. ..... [3]

For Examiner's Use

(c) A logging company wants to cut down the forest area.

(i) Suggest what effects this deforestation might have on the climate further inland. Explain your answer.

.....

.....

..... [2]

(ii) State two other effects deforestation could have on the environment.

1. .....

.....

2. .....

..... [2]

[Total: 10]

For Examiner's Use

5 Five types of animal and plant cells and five possible functions of such cells are shown below.

Draw **one** straight line from each type of cell to a function of that cell.

type of cell	function of cell
red blood cell	absorption of mineral ions
root hair cell	transport of oxygen
white blood cell	movement of mucus
xylem	protection against pathogens
ciliated cell	structural support

[5]

[Total: 5]

6 Fig. 6.1 shows four test-tubes that were set up and left for six hours at a constant warm temperature.

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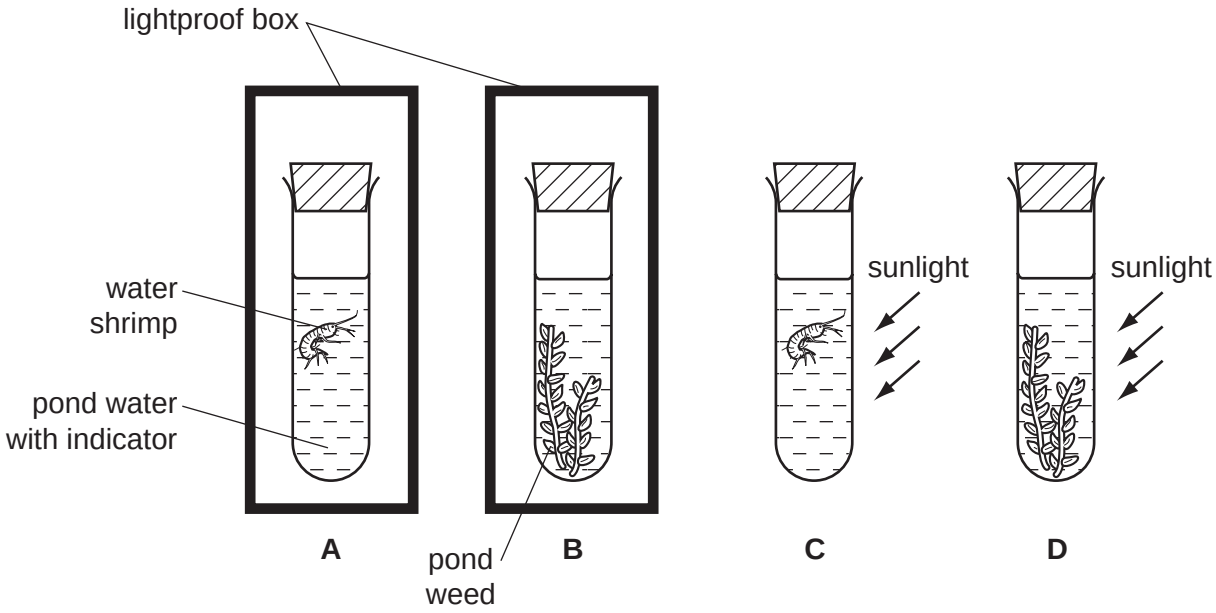


Fig. 6.1

Hydrogencarbonate indicator (bicarbonate indicator) changes colour depending on the pH of gases dissolved in it, as shown in Fig. 6.2.

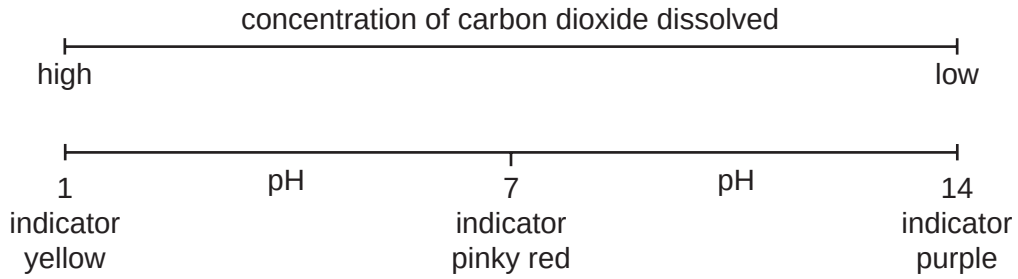


Fig. 6.2

After six hours the colour of the indicator in all four tubes had changed.

(a) (i) Complete Table 6.1 to predict the colour of the indicator after six hours.

Table 6.1

tube	colour of indicator at start	colour of indicator after six hours
A	pinky red	
B	pinky red	
C	pinky red	
D	pinky red	

[4]

(ii) Suggest the reason for the change in colour of the indicator in each of tubes **A** and **D**.

tube **A** .....

.....

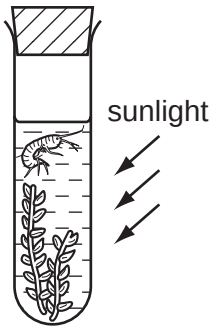
.....

tube **D** .....

.....

..... [4]

(b) Fig. 6.3 shows a fifth tube, **E**, set up at the same time and in the same conditions as tubes **C** and **D**.



E

Fig. 6.3

Suggest and explain the possible colour of the indicator in tube **E** after six hours.

colour of indicator .....

explanation .....

.....

.....

..... [3]

[Total: 11]

For Examiner's Use

7 **(a)** Complete the following paragraph using appropriate words.

Sense organs are composed of groups of ..... cells that respond to specific ..... . The sense organs that respond to chemicals are the ..... and the ..... . [4]

(b) The eye is a sense organ that focuses light rays by changing the shape of its lens. It does this by contracting its ciliary muscles.

(i) What links the ciliary muscles to the lens?

..... [1]

(ii) Describe the change in shape of the lens when a person looks from a near object to a distant object.

.....

..... [1]

(c) Fig. 7.1 shows changes in the contraction of the ciliary muscles as a person watches a humming bird move from flower to flower while feeding on nectar.

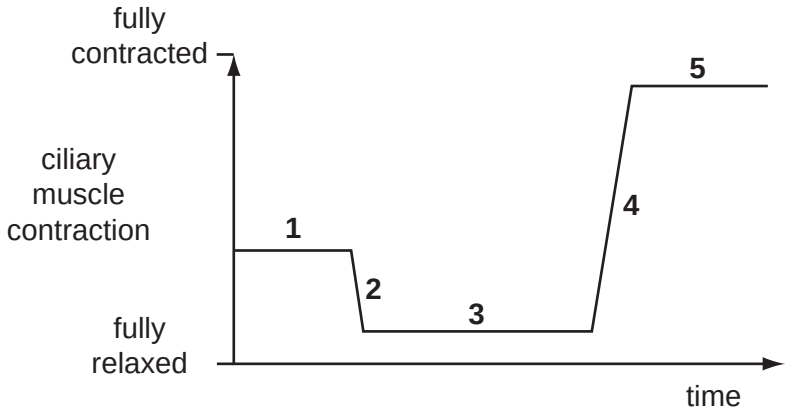


Fig. 7.1

In which period of time, **1**, **2**, **3**, **4** or **5**, was the bird

(i) feeding from a flower very near to the person,

..... [1]

(ii) flying away from the person,

..... [1]

(iii) flying towards the person.

..... [1]

[Total: 9]

For Examiner's Use

8 Fig. 8.1 shows the male reproductive system.

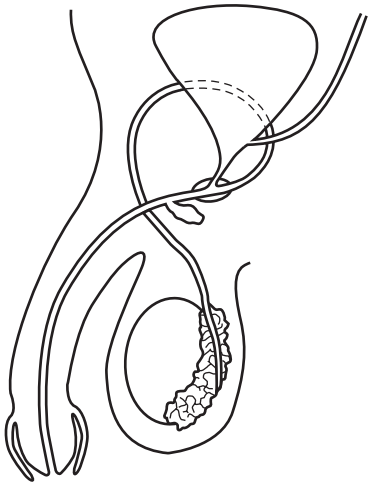


Fig. 8.1

(a) Using a label line and the letters given, label on Fig. 8.1,

(i) **G** where gametes are formed, [1]

(ii) **S** the sperm duct, [1]

(iii) **T** where testosterone is formed, [1]

(iv) **U** the urethra. [1]

(b) Describe two secondary sexual characteristics regulated by testosterone.

1. .....

.....

2. .....

..... [2]

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(c) Choose words from the list to complete each of the spaces in the paragraph. Each word may be used once only and some words may not be used at all.

four **diploid** **double** **half**

haploid **meiosis** **mitosis** **two**

Gametes are formed by the division of a nucleus, a process called

..... . This process produces a total of .....

cells from the original cell. Each of these cells has a nucleus described as being

..... and each nucleus contains .....

the number of chromosomes present in the original nucleus. [4]

[Total: 10]

For Examiner's Use

9 Modern technology can be used to increase the yield of crops.

(a) The use of chemicals, such as fertilisers, herbicides and pesticides, is one of the developments used.

(i) Name two mineral ions commonly included in fertilisers.

1. .....

2. ..... [1]

(ii) Explain the dangers to the local environment of the overuse of fertilisers on farmland.

.....

.....

.....

.....

.....

..... [4]

(iii) Suggest how the use of herbicides can be of benefit to crop plants.

.....

.....

.....

.....

..... [3]

(iv) Suggest two dangers of using pesticides on farmland.

1. .....

.....

2. .....

..... [2]

(b) Artificial selection and genetic engineering can also be used to increase crop yields.

Explain the difference between these two techniques.

.....

.....

.....

..... [2]

[Total: 12]

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