Centre Number	Candidate Number	Name

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

BIOLOGY

0610/02

Paper 2

October/November 2005

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 in the spaces provided at the top of this page.
Write in dark blue or black pen in the spaces provided on the Question Paper.
You may use a soft pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.

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

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 Select from the list the name of the group of animals that best fits each description.

Write your choice in Table 1.1.

arachnid bird crustacean insect

mammal mollusc nematode

Table 1.1

description of animal	group
a hard exoskeleton and more than 4 pairs of legs	
a hard shell and a slimy muscular foot	
one pair of wings and a beak	
one pair of wings and has skin covered with fur	
two pairs of wings and one pair of antennae	

[5]

[Total: 5]

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QUESTION 2 IS ON PAGE 4

2 **(a)** Name two types of stimuli detected by the skin.

1. .....

2. ..... [2]

(b) Fig. 2.1 shows a diagram of an eye in section.

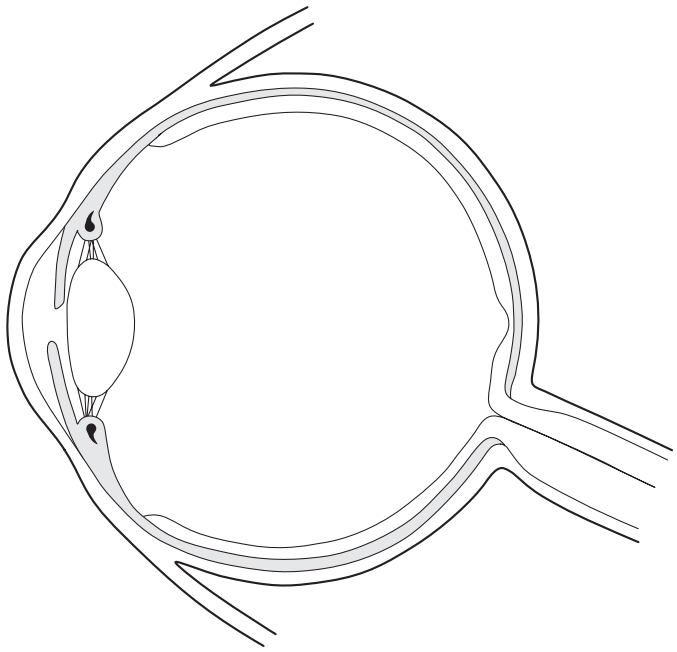


Fig. 2.1

When a bright light is shone in the eye a pupil reflex occurs.

On Fig. 2.1, using label lines

(i) label with an **X** where the stimulus for this reflex is detected, [1]

(ii) label with a **Z** the effector for this reflex. [1]

(c) Fig. 2.2 shows a reflex arc.

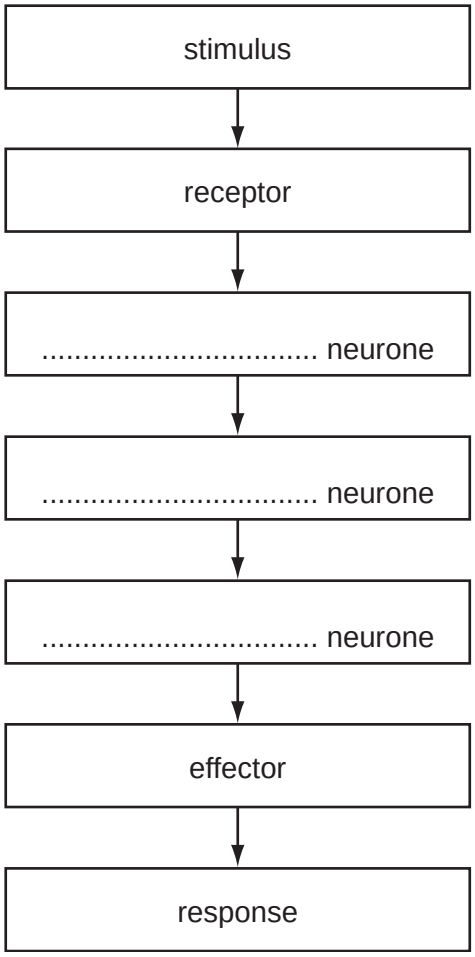


Fig. 2.2

Complete Fig. 2.2 by **naming** the neurones that link the receptor with the effector. [3]

(d) The ciliary body, cornea, lens and suspensory ligaments are involved in the focussing of the eye.

Describe how each of these structures helps bring about the focussing of the image of this page by your eye.

.....

.....

.....

.....

.....

..... [4]

[Total: 11]

3 **(a)** Define the terms

(i) excretion,

.....

..... [1]

(ii) egestion.

.....

..... [1]

(b) The kidney is an excretory organ. It produces urine that contains urea.

(i) State where in the body urea is formed.

..... [1]

(ii) State what urea is formed from.

..... [1]

(c) Fig. 3.1 shows the urinary system and its blood supply.

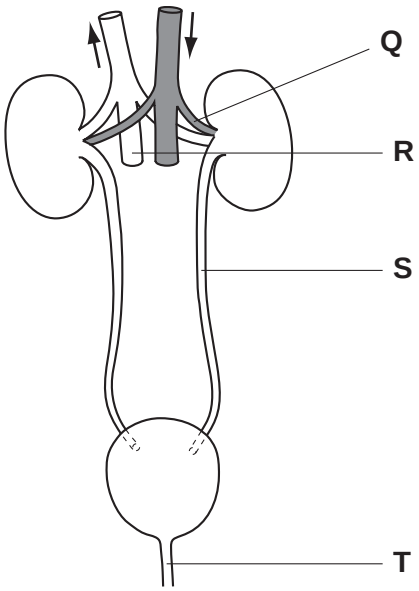


Fig. 3.1

Name the parts labelled **Q**, **R**, **S** and **T**.

Q .....

R .....

S .....

T ..... [4]

(d) Complete Table 3.1 to show which components of the blood are also part of the urine of a healthy person.

Use ticks (✓) and crosses (✕). Two boxes have already been completed.

Table 3.1

component of blood	present in urine
glucose	
red blood cells	
salts	
urea	✓
water	
white blood cells	✕

[2]

[Total: 10]

4 **(a)** Fig. 4.1 shows the apparatus used in an investigation.

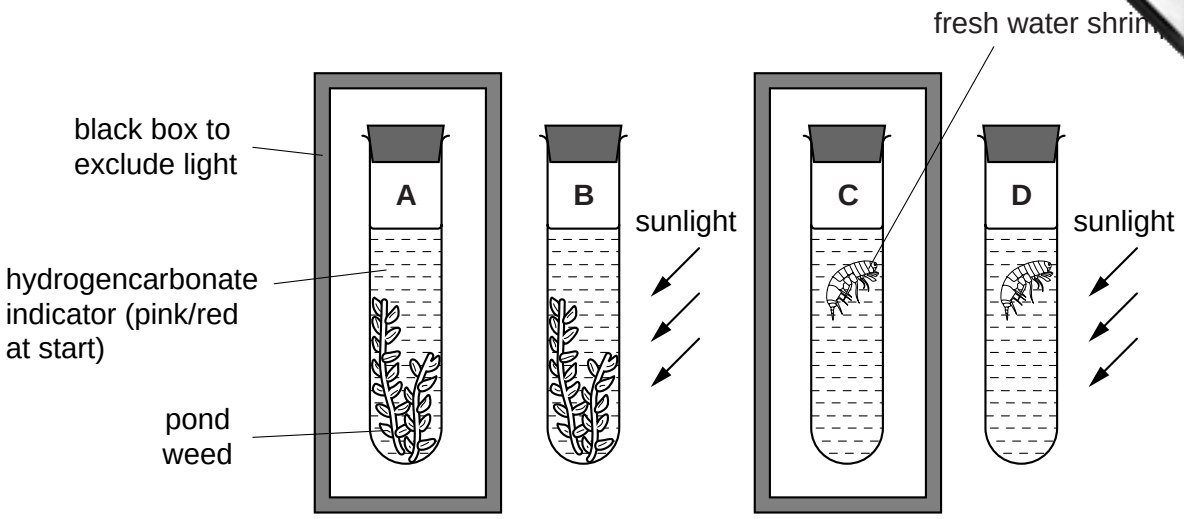


Fig. 4.1

Complete Table 4.1 to show whether photosynthesis and respiration are happening in each tube.

Table 4.1

tube	contents and conditions	photosynthesis happening	respiration happening
A	pond weed in dark		
B	pond weed in bright light		
C	fresh water shrimp in dark		
D	fresh water shrimp in bright light		

[4]

(b) Hydrogencarbonate indicator changes colour according to the pH of the cont each tube, as shown in the pH chart in Fig. 4.2.

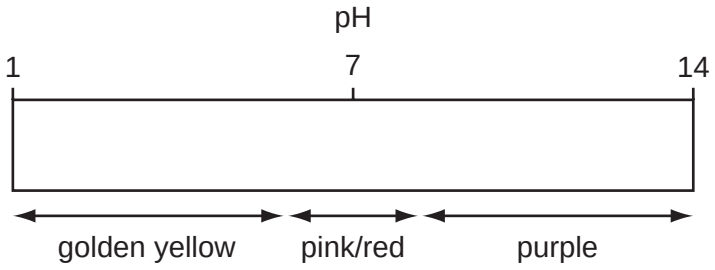


Fig. 4.2

The apparatus, shown in Fig. 4.1, was left for several hours.

(i) Complete Table 4.2 by predicting the colour of the indicator in each of the four tubes.

Table 4.2

tube	contents and conditions	colour of hydrogencarbonate indicator after several hours
A	pond weed in dark	
B	pond weed in bright light	
C	fresh water shrimp in dark	
D	fresh water shrimp in bright light	

[2]

(ii) Explain your predictions, stated in Table 4.2, for the colours of the hydrogencarbonate indicator in each of the tubes.

.....

.....

.....

.....

.....

..... [4]

[Total: 10]

5 **(a)** **(i)** Which form of the Sun's energy is used by plants?

.....

[1]

(ii) Name the process that uses this absorbed energy.

.....

[1]

(b) The graph, Fig. 5.1, shows how the concentration of carbon dioxide in the atmosphere has changed over a period of about 20 years.

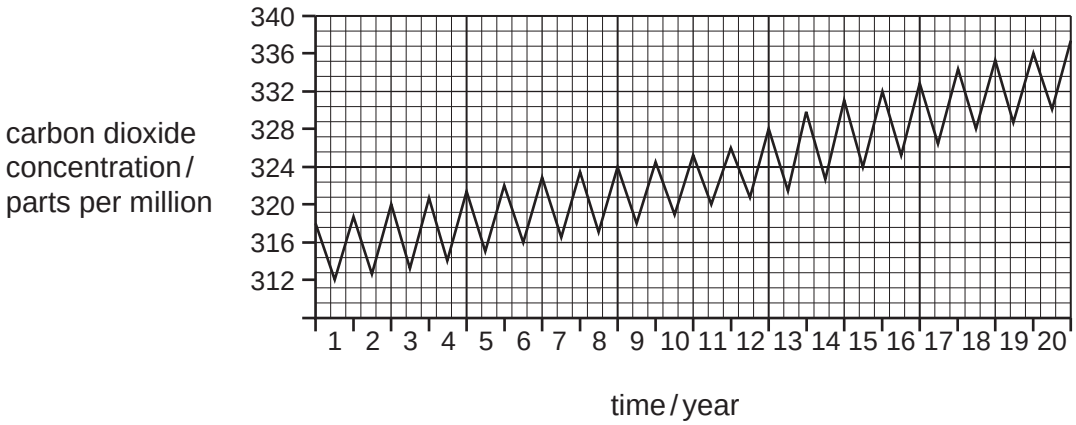


Fig. 5.1

Describe the changes shown by this graph.

.....

.....

.....

[2]

(c) The atmosphere around the earth acts as a trap for energy from the Sun.

Carbon dioxide in the air traps heat energy.

(i) Suggest the effect the overall change in the graph, Fig. 5.1, may be having on the Earth's climate. Explain your answer.

Effect .....

Explanation .....

.....

.....

[3]

(ii) Humans cause changes in ecosystems, including changing the amount of dioxide in the atmosphere.

Suggest two ways in which the overall change can be reversed.

1 .....

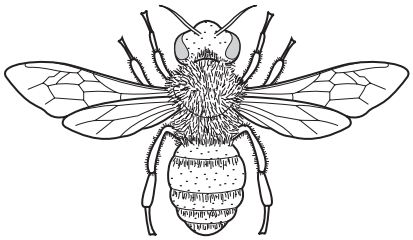
.....

2 .....

..... [2]

[Total: 9]

6 Fig. 6.1 shows a bee that collects food materials from some flowers belonging to th
species. While it does this the bee also assists in the reproductive processes of the flow



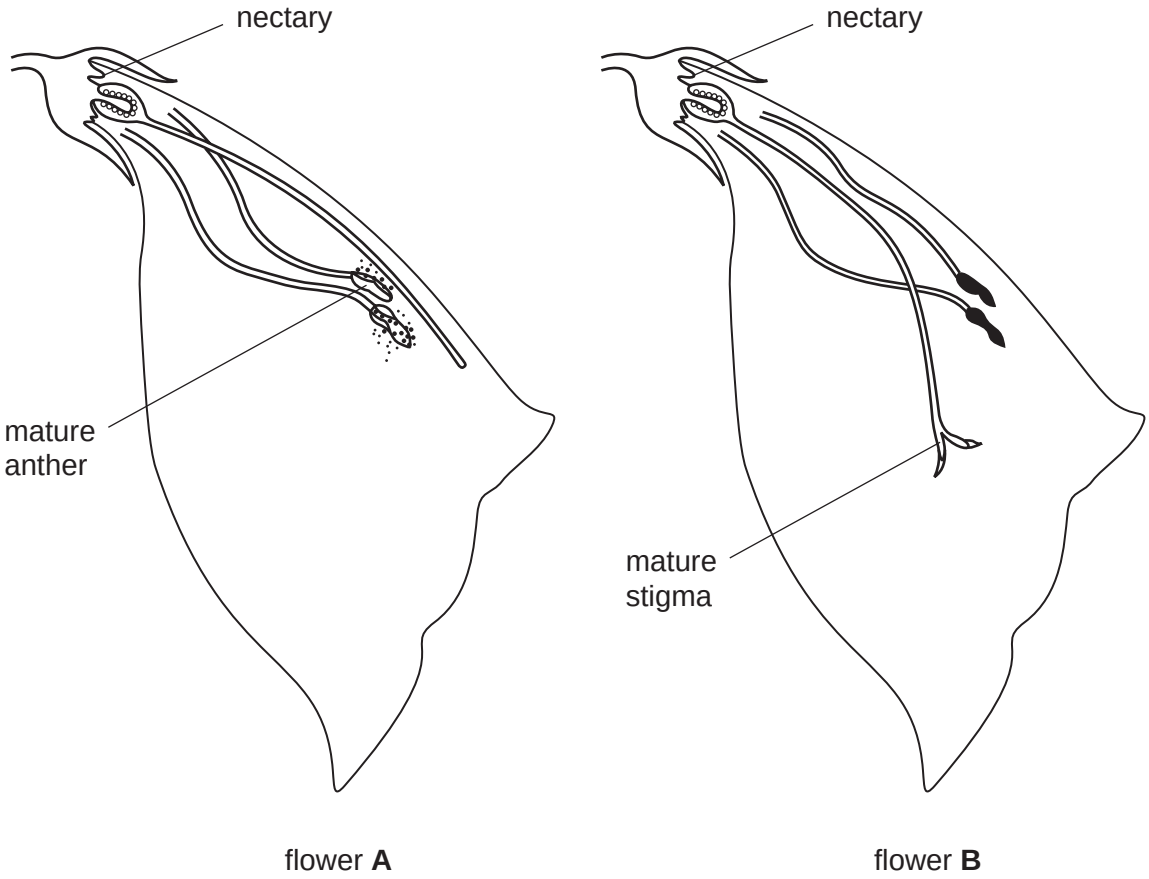


Fig. 6.1

(a) (i) Name the stage in the reproduction of the plants in which the bee is involved.

.....

.....

[1]

(ii) Suggest how this process might take place between flowers **A** and **B**.

.....

.....

.....

.....

[3]

(b) The ovules in each flower can develop into seeds.

(i) Which reproductive process must happen inside an ovule before it can become a seed?

.....

[1]

(ii) State which part of the flower develops into a fruit.

.....

[1]

(c) Explain why plants grown from the seeds produced by these flowers will be similar to each other but may not be identical.

.....

.....

.....

.....

.....

[4]

[Total: 10]

7 Fig. 7.1 shows the heart rate and the cardiac output. The cardiac output is the vo
blood pumped out of the heart each minute.

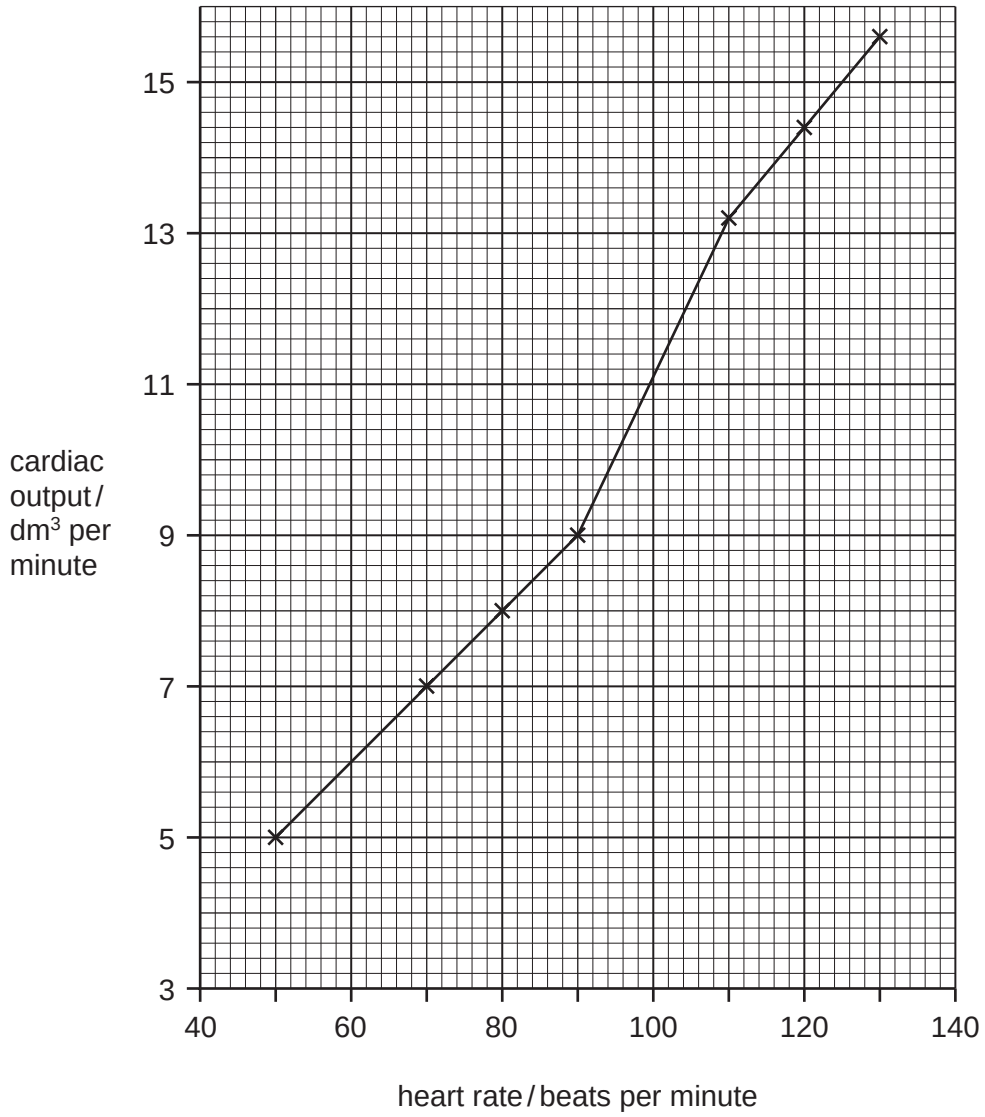


Fig. 7.1

(a) (i) What is the cardiac output at a heart rate of 100 beats per minute?

..... [1]

(ii) Determine the increase in cardiac output when the heart rate increases from 70 to 90 beats per minute

..... dm^3 per minute [1]

(iii) Determine the increase in cardiac output when the heart rate increases from 100 to 120 beats per minute.

..... dm^3 per minute [1]

(b) (i) Which chamber of the heart pumps blood into the aorta?

.....

[

(ii) The upper and lower chambers on each side of the heart are separated by valves.

State the function of these valves.

.....

.....

[1]

[Total: 5]

8 **(a)** Plants need a supply of both magnesium ions and nitrate ions.

(i) Describe how root hair cells are adapted to increase the absorption of these ions.

.....

..... [1]

(ii) Name the tissue in which these ions are carried to the leaves.

..... [1]

(b) State what each of these ions is used for in a plant leaf cell.

magnesium ions .....

.....

nitrate ions .....

..... [2]

(c) Most fertilisers contain materials that become nitrate ions in the soil.

(i) State why such fertilisers are often added to fields of crops.

.....

..... [1]

(ii) Describe the possible environmental effects of adding too much fertiliser to the soil.

.....

.....

.....

.....

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..... [5]

[Total: 10]

9 Fig. 9.1 shows a side view of the female reproductive system.

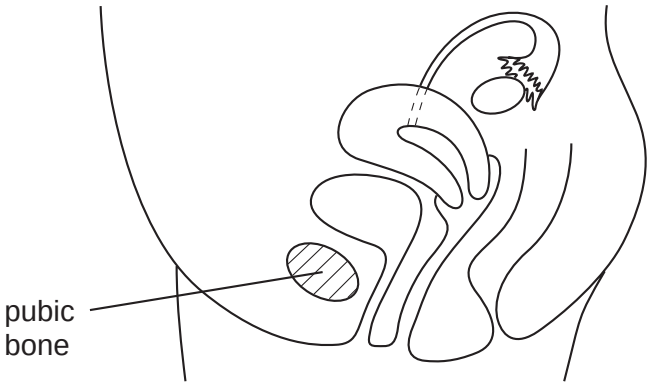

Fig. 9.1

(a) On Fig. 9.1, label each of the following with the appropriate letter and a label line.

(i) The site where sperm are deposited. **D** [1]

(ii) The site where fertilisation normally occurs. **F** [1]

(iii) The site where oestrogen is produced. **O** [1]

(iv) A site where the placenta would normally develop during pregnancy. **P** [1]

(v) A site where a surgical method of birth control could be used. **S** [1]

QUESTION 9 CONTINUES ON PAGE 18

(b) The placenta has many roles during pregnancy. For example maternal and fetal blood prevented from mixing but digested nutrients pass across the placenta to the fetus.

(i) State two reasons why maternal and fetal blood should not mix.

1 .....

.....

2 .....

..... [2]

(ii) List three other roles of the placenta.

1 .....

.....

2 .....

.....

3 .....

..... [3]

[Total: 10]

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