Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

1490757939

BIOLOGY **0610/22**

Paper 2 Core **May/June 2014**

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

Answer **all** questions.

Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

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.

The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **18** printed pages and **2** blank pages.

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1 Fig. 1.1 shows five molluscs. They all live in the sea or on the shore.

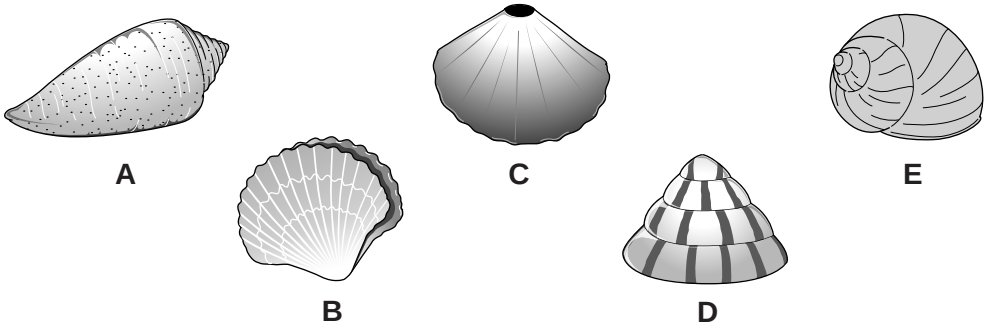


Fig. 1.1

Use this key to identify these molluscs.

1	Shell has one part	Go to 2
	Shell has two parts	*C. edule*
2	Shell has a hole in the top	*F. aperta*
	Shell does not have a hole in the top	Go to 3
3	Shell is narrow, with an obvious point	*C. australis*
	Shell is rounded with no obvious point	Go to 4
4	Shell is plain, with no pattern	*L. littorea*
	Shell is patterned	*T. regina*

Write your answers in Table 1.1.

Table 1.1

mollusc	name
A	
B	
C	
D	
E	

[4]

[Total: 4]

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2 **(a)** Use words from the following list to complete the passage about plant reproduction.

You may use each word once, more than once or not at all.

asexual	**cotyledon**	**diploid**	**fertilisation**	**gamete**
haploid	**pollination**	**sexual**	**testa**	**zygote**

Living organisms must reproduce to replace organisms which die, and to supply more organisms to occupy new environments. Genetically identical offspring are produced from a single parent during the process of ..... reproduction. During ..... reproduction, a special cell called a ..... is made by one parent and fuses with a ..... from another parent. This process of fusion is called ..... and may eventually lead to the development of a seed.

[3]

(b) Describe how potatoes reproduce asexually.

.....

.....

.....

.....

.....

..... [3]

[Total: 6]

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[Turn over

3 A woman wants to have a baby.
Her doctor suggests that she measures her temperature every day to find out when she ovulates.

On the day that she ovulates, her temperature will increase sharply.

Fig. 3.1 shows her temperature results over ten days.

(a) She forgot to measure her temperature on day 7.

(i) Use Fig. 3.1 to work out what her temperature would have been on day 7.

..... ^{o}C [1]

(ii) On which day did she ovulate?

..... [1]

(iii) Her doctor told her to measure her temperature at the same time each day.

Explain why this is important.

..... [1]

(b) Ovulation is controlled by the release of a hormone.
The hormone responsible for the changes in a girl's body when puberty takes place is the same as the hormone that controls ovulation.

(i) Name this hormone.

..... [1]

(ii) State how hormones travel round the body.

..... [1]

[Total: 5]

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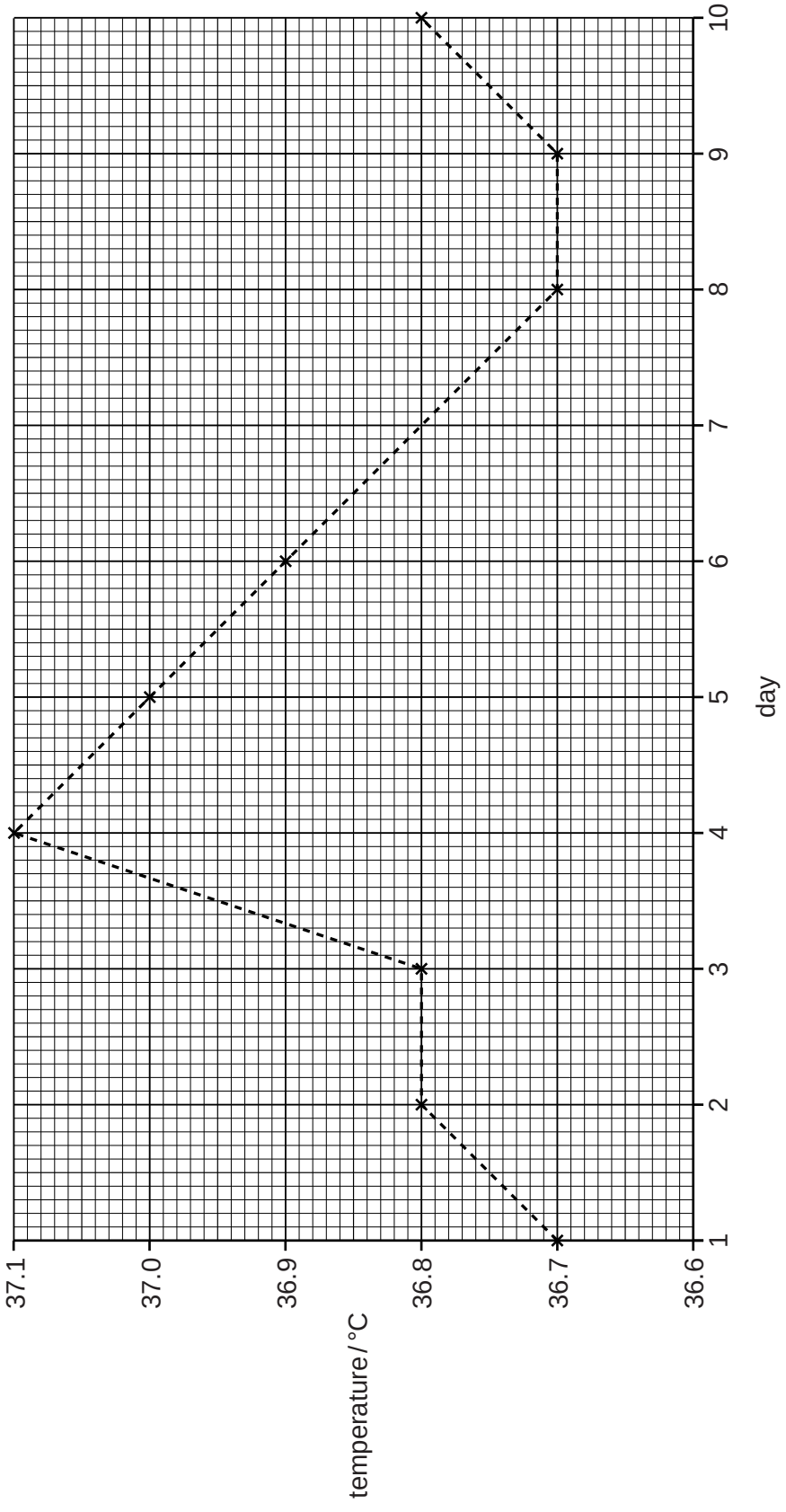


Fig. 3.1

4 Cells are adapted to their function, and may be arranged into tissues.

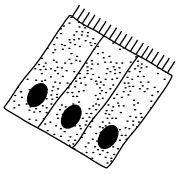
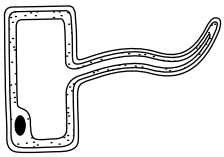
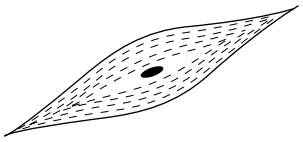
(a) Define the term *tissue*.

.....

..... [1]

(b) Fig. 4.1 shows four cell types.

Draw lines to join the diagrams with the description of each cell's function.

cell type	cell function
	absorption
	contraction
	protection in respiratory system
	transport

[3]

Fig. 4.1

(c) Living cells may take in useful materials by diffusion.

(i) Define the term *diffusion*.

.....

.....

.....

..... [2]

(ii) Complete Table 4.1 by naming the substances that move by diffusion in the following parts of the body.

Table 4.1

part of body	direction of diffusion	name of substance that diffuses
lungs	from air in alveolus to red blood cell	
small intestine	across villus to blood in capillary	
biceps	from muscle cell to blood in capillary	

[3]

[Total: 9]

5 **(a)** Fig. 5.1 shows the proportion of different food groups in a diet.

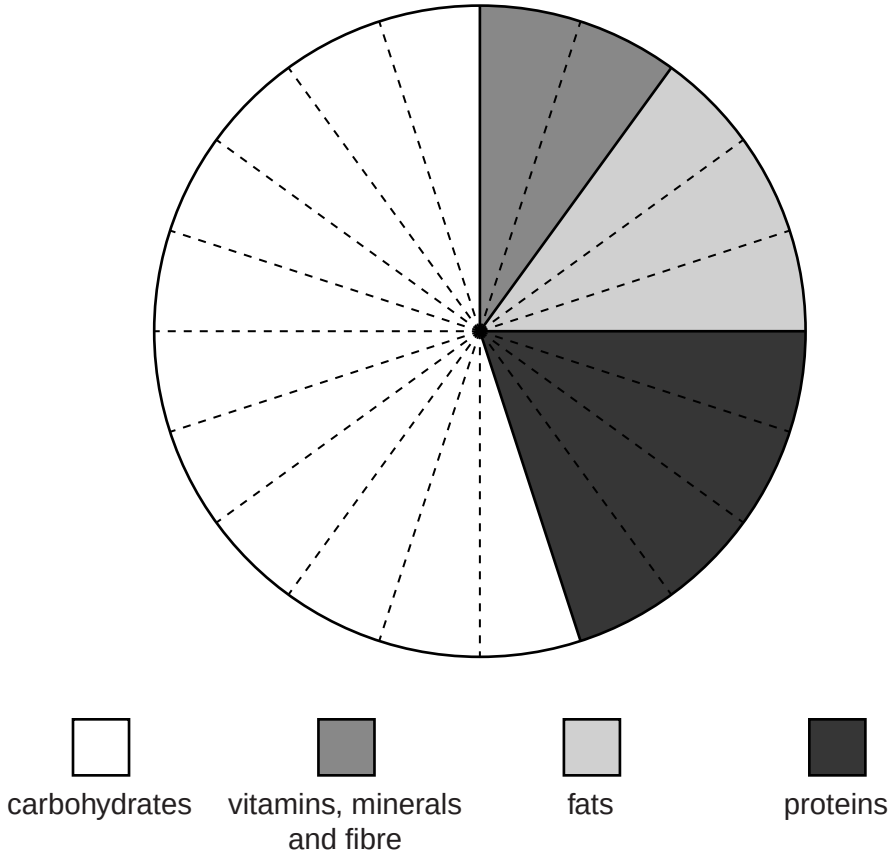


Fig. 5.1

(i) State the two food groups, shown in Fig. 5.1, that supply the most energy per kilogram.

..... and .....

[2]

This diet has a low proportion of iron and vitamin D.

(ii) Describe **one** effect of a shortage of iron in the human diet.

.....

..... [1]

(iii) Describe **one** effect of a shortage of vitamin D in the human diet.

.....

..... [1]

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(b) Fig. 5.2 shows how much energy is required, each day, by different people.

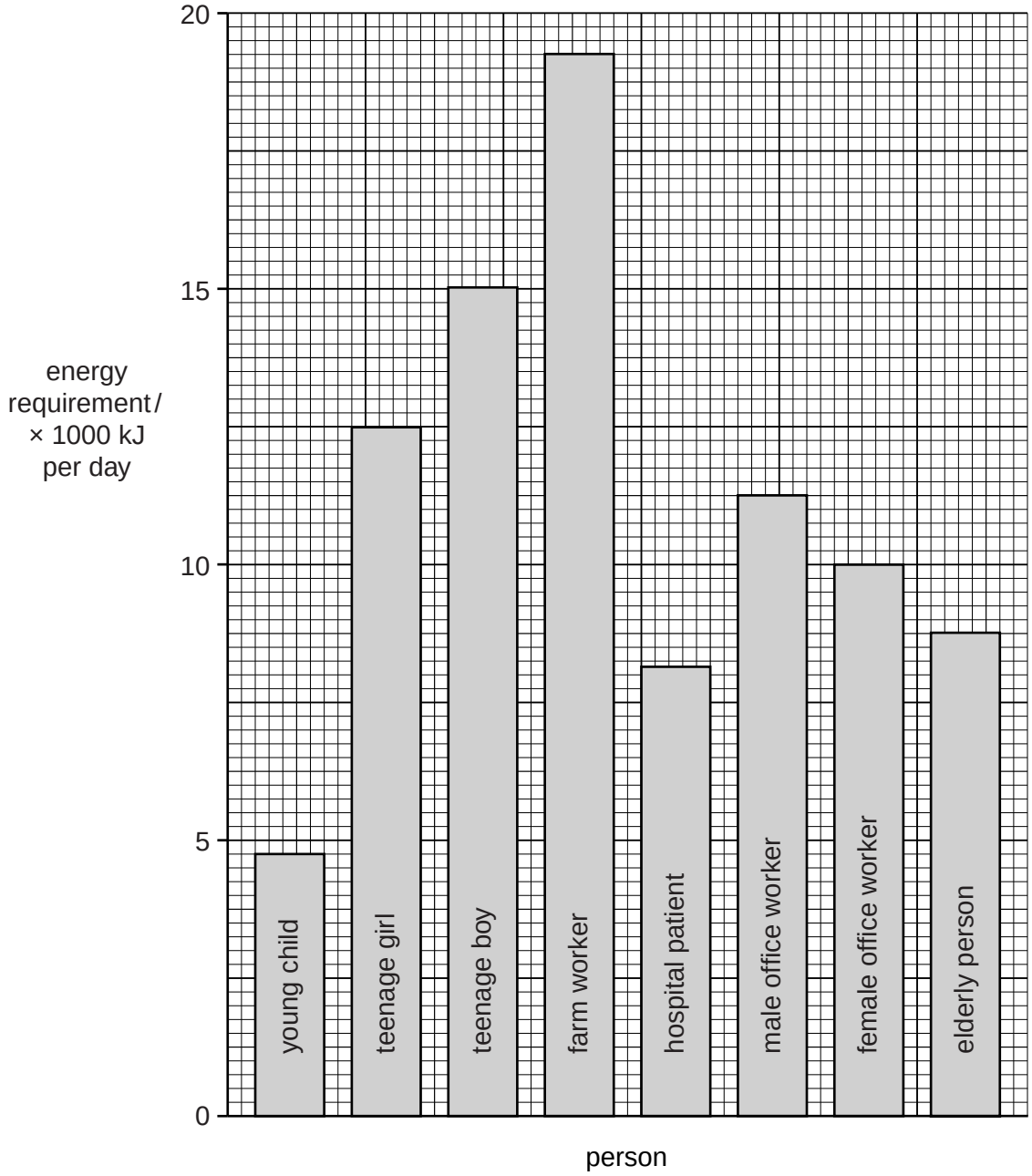


Fig. 5.2

(i) Use Fig. 5.2. to suggest **two** factors which affect the energy requirements of a person.

1 .....

2 .....
[2]

(ii) Explain why a female office worker with a daily intake of 15 000 kJ is likely to become overweight.

.....

.....

.....

..... [2]

(c) In many parts of the world, rice forms an important part of the diet.

Rice contains a high proportion of starch.

Egg, chicken or fish may be added to the rice.

(i) State why undigested starch cannot be used by the body.

.....

..... [1]

(ii) If food containing a lot of starch is chewed for a long time, it may leave a sweet taste in the mouth.

Explain why this happens.

.....

.....

.....

..... [2]

(iii) Suggest the benefit of adding egg, chicken or fish to the rice.

.....

..... [1]

(iv) Rice is not the only food that contains a lot of starch.

Name **two** other foods that contain a lot of starch.

1 .....

2 .....
[2]

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(v) Rice is usually boiled, but it can also be cooked in fat.
There may be harmful effects to the body of eating too much fatty food.

Describe **two** ways in which too much fat in the diet may be harmful to the body.

1 .....

.....

2 .....

.....
[2]

[Total: 16]

6 The zebra fish, *Brachydanio rerio,* is a small tropical fish which lives in freshwater streams.

In zebra fish, the allele for dark eye colour, D, is dominant to the allele for light eye colour, d.

Fig. 6.1 shows a dark-eyed fish and a light-eyed fish.

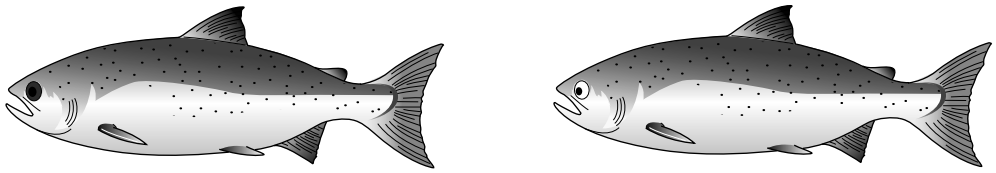


Fig. 6.1

(a) Two dark-eyed fish were allowed to breed together.
They produced 32 offspring. 24 of these offspring were dark-eyed.

Calculate the ratio of dark-eyed to light-eyed offspring. Show your working.

..... [2]

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(b) Complete this genetic diagram for the original cross between the two dark-eyed parent fish.

parental phenotypes: dark-eyed dark-eyed

parental genotypes: ....

gametes: (.....) (.....) (.....) (.....)

offspring genotypes: ....

offspring phenotypes: ....

[5]

Fig. 6.2

(c) Sometimes zebra fish have one dark eye and one light eye. This is very unusual.

(i) Name the genetic change which could produce this unusual appearance.

..... [1]

(ii) Suggest **two** environmental factors that can increase the rate of this process.

1 .....

2 .....

[2]

[Total: 10]

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7 Fig. 7.1 shows some of the feeding relationships in an oak woodland.

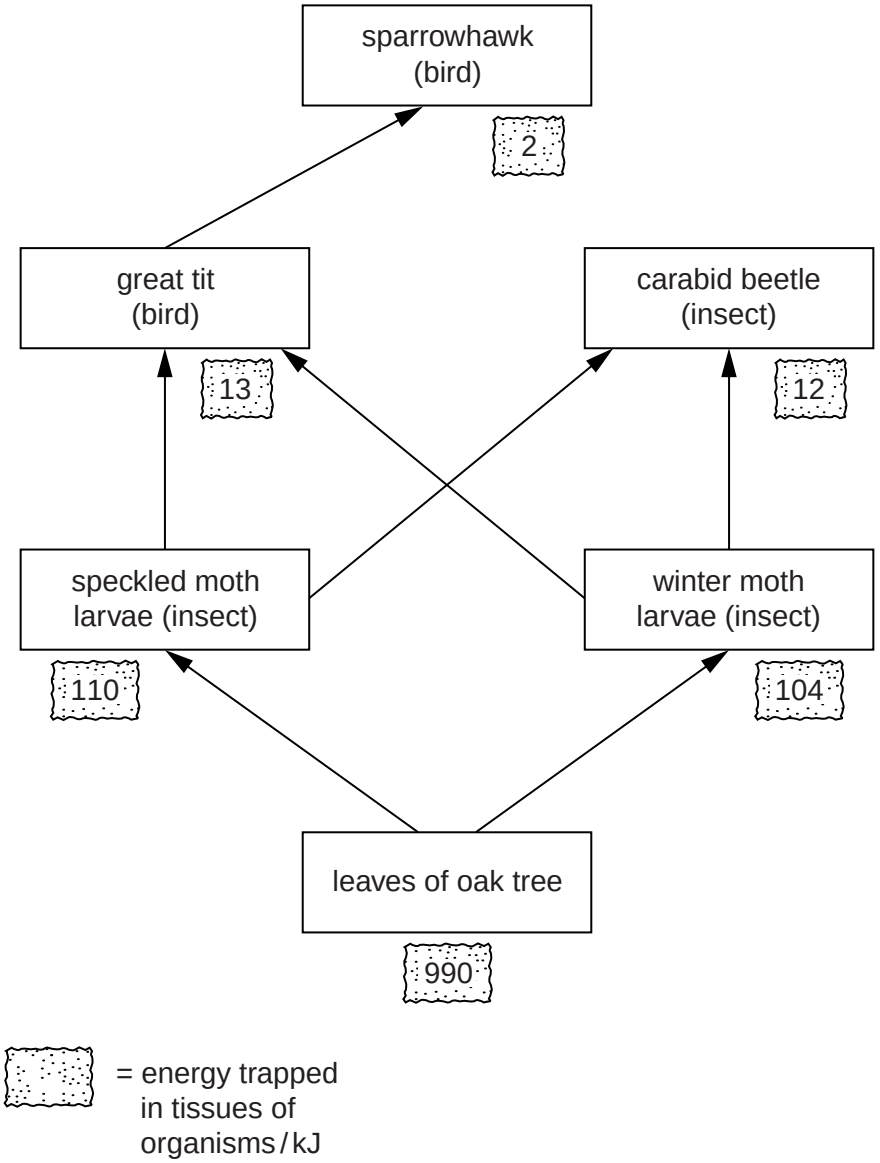


Fig. 7.1

(a) Use the information in Fig. 7.1 to name:

a producer .....

an organism that feeds on consumers. .....

[2]

(b) **(i)** Name the two secondary consumers in this food web.

..... and .....

[1]

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(ii) Calculate the total amount of energy trapped in the tissues of these secondary consumers.

..... kJ [1]

(c) The leaves of the oak tree are the only part of this food web capable of trapping energy by photosynthesis.

Calculate the percentage of the energy trapped by the oak leaves which becomes part of the tissues of the primary consumers.

Show your working. Give your answer as a percentage.

..... % [3]

(d) Some sparrowhawks have not been able to produce young because their eggs have only very thin shells. The tissues of these female sparrowhawks were found to contain high concentrations of insecticide.

Sparrowhawks do not eat insects.

Suggest how high concentrations of insecticide could have built up in the bodies of the sparrowhawks. Refer to Fig. 7.1 in your answer.

.....

.....

.....

..... [3]

[Total: 10]

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[Turn over

8 In an ecosystem, there is an interaction between the living and the non-living environment. One part of this interaction is the recycling of materials such as carbon.

Fig. 8.1 shows the carbon cycle.

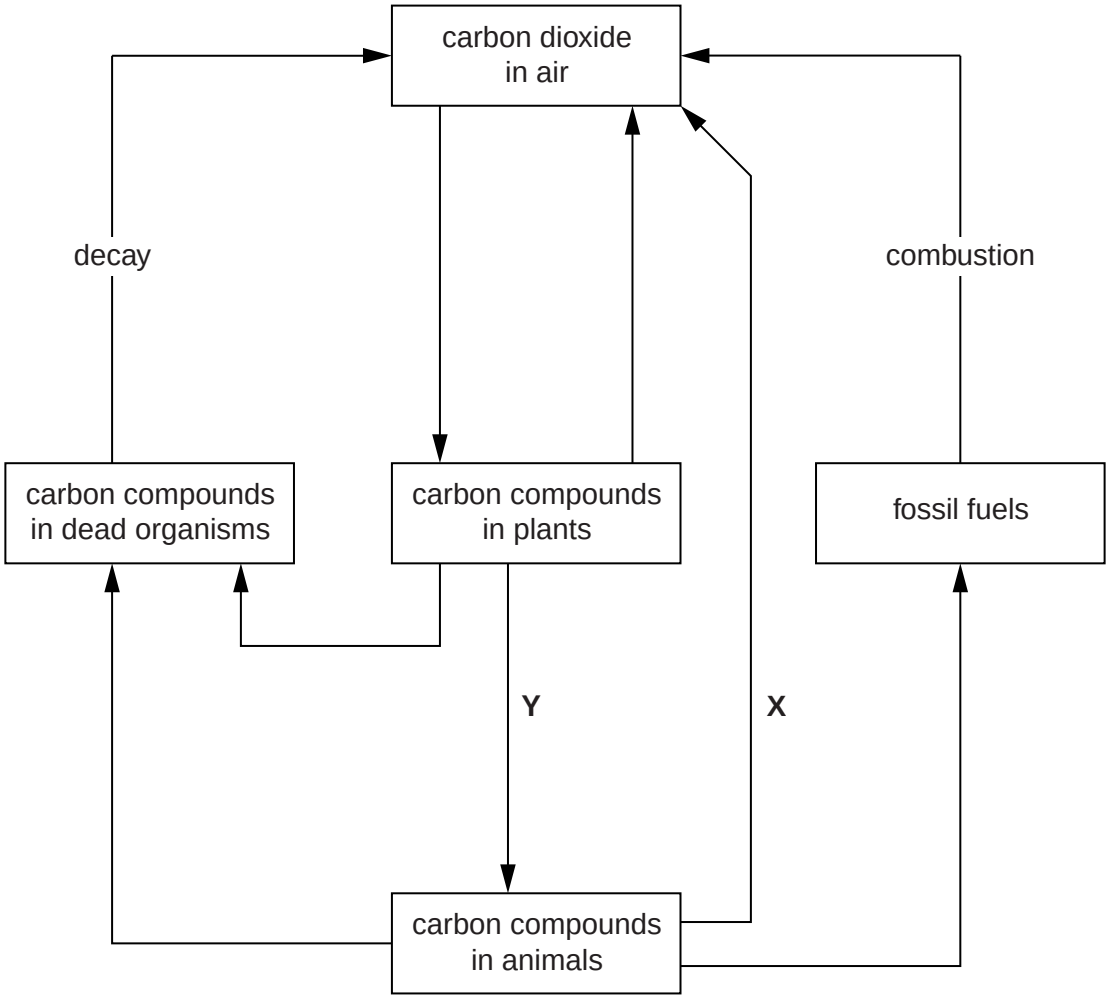


Fig. 8.1

Use information from Fig. 8.1, and your own knowledge, to answer the following questions.

(a) (i) Label with the letter **P** an arrow to show where photosynthesis occurs. [1]

(ii) Write the word equation for photosynthesis.

..... [2]

(iii) Name the green pigment in plants that is needed for photosynthesis.

..... [1]

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(iv) Many rainforests are being cut down.
This can bring about an increase in the percentage of carbon dioxide in the air.

Explain how this happens.

.....

.....

.....

..... [2]

(b) Name the processes labelled **X** and **Y** in Fig. 8.1.

process X .....

process Y .....

[2]

(c) **(i)** The waste stems that remain after a cereal crop has been harvested are called straw.
Farmers in some countries burn straw after the harvest.

What effect does this have on the amount of carbon dioxide in the environment?

..... [1]

(ii) Scientists suggest that it would be better for the environment if the straw was dug or ploughed back into the soil.
In the soil, the straw could decay and decompose.

Name **one** of the main groups of organisms that is responsible for decay and decomposition.

..... [1]

(iii) State **two** of the main benefits to plants of decomposition.

1 .....

.....

2 .....

.....
[2]

[Total : 12]

9 If dust lands on the surface of their eye, a person will automatically blink.

This is an example of a reflex action.

(a) Give another example of a reflex action, and explain why it is important to humans.

name of reflex action. .....

importance to humans. ……

.....

[2]

(b) Complete Table 9.1 to compare a nervous response with a hormonal response.

Table 9.1

	nervous	hormonal
signal type		
transmission route		
transmission speed		
duration of effect		

[4]

(c) Plants can also show responses. For example, plant stems grow towards light.

(i) Name this response.

.....[1]

(ii) Explain why this response is important to a plant.

..... [1]

[Total: 8]

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