Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

BIOLOGY **0610/33**

Paper 3 Core **May/June 2016**

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 **21** printed pages and **3** blank pages.

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1 Fig. 1.1 shows five arthropods.

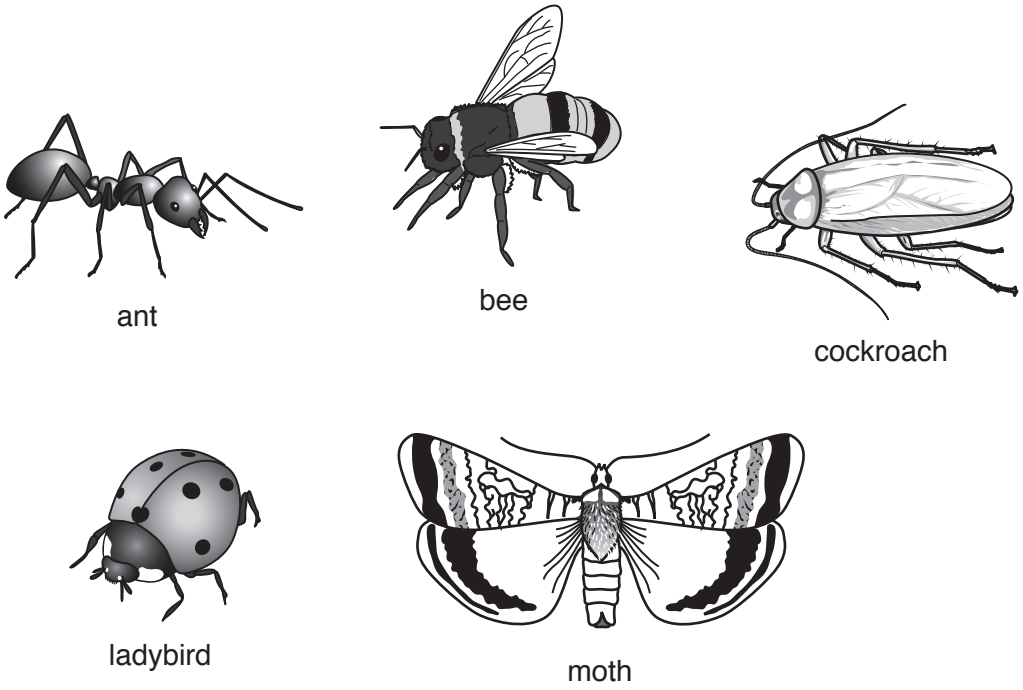

Fig. 1.1

(a) State **one** feature that is shared by **all** arthropods.

View solution

.....[1]

(b) The five animals in Fig. 1.1 all belong to the same group of arthropods.

View solution

(i) Name this group of arthropods.

Choose your answer from this list.

arachnids **crustaceans** **insects** **myriapods**

.....[1]

(ii) State **two** visible features of the bee, shown in Fig. 1.1, which place it in this group.

View solution

1 .....

2 .....

[2]

[Total: 4]

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2 Fig. 2.1 shows the flow of blood through the human heart and its associated blood vessels **A**, **B**, **C** and **D**.

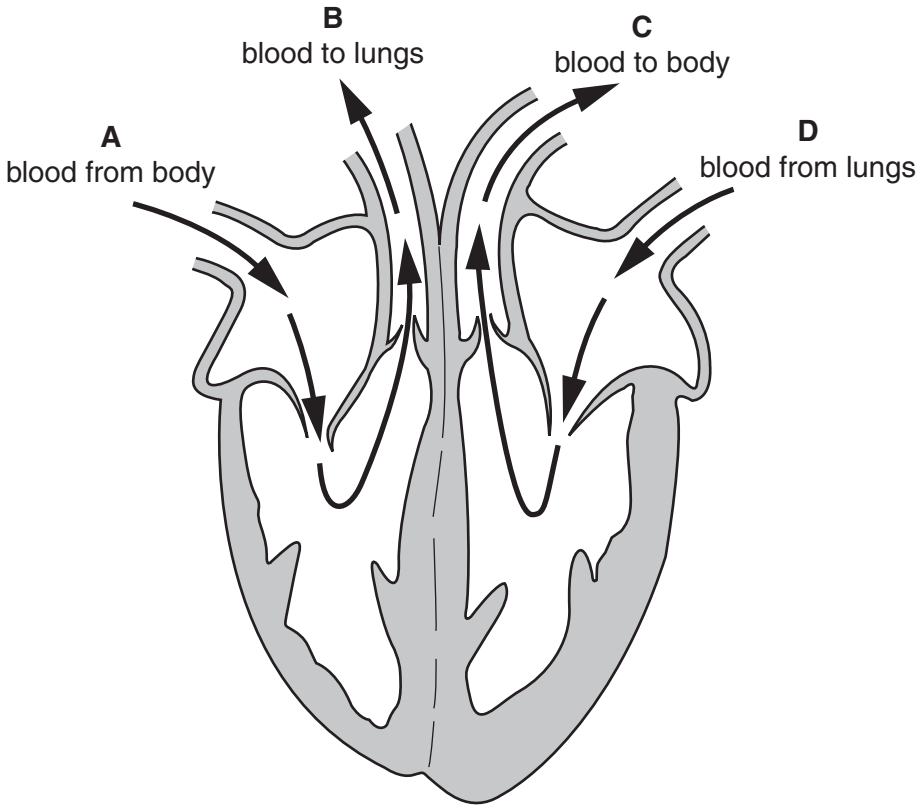

Fig. 2.1

View solution

(a) (i) State **two** ways in which the structure of blood vessel **C** is different from the structure of blood vessel **A**.

1 .....

.....

2 .....

.....

[2]

View solution

(ii) Tick the box that describes the blood in the vessel labelled **D**.

high pressure, deoxygenated ☐

high pressure, oxygenated ☐

low pressure, deoxygenated ☐

low pressure, oxygenated ☐

[1]

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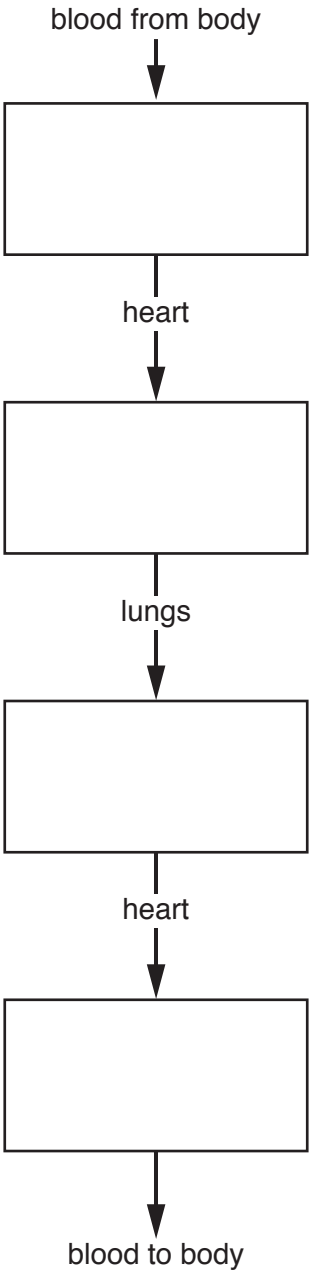
(b) Complete the flow chart by writing the **name** of each blood vessel in the correct box to show the order in which blood travels through them.

View solution

Use names from this list.

aorta **pulmonary artery** **pulmonary vein** **vena cava**



[3]

[Total: 6]

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3 **(a)** Water enters plants through the root hairs and escapes to the air from the leaves.

View solution

(i) Name the term that is used to describe the loss of water vapour from the leaves.

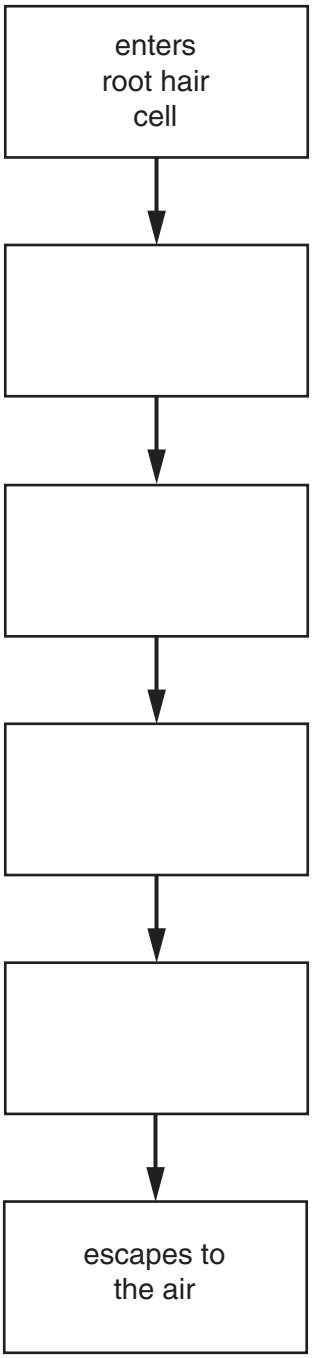
.....[1]

(ii) Complete the flow chart by writing in the boxes the names of the parts through which water passes after it enters the root hair cells.

View solution

Choose words from the list.

mesophyll cells **cortex cells** **stomata** **xylem**



[3]

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Fig. 3.1 shows a display of cut flowers in a shop.

At 6 am the flowers were placed in identical jars, **E**, **F**, **G** and **H**.

Each jar contained 500 cm^3 of water.

At 8 pm the jars all contained different volumes of water.

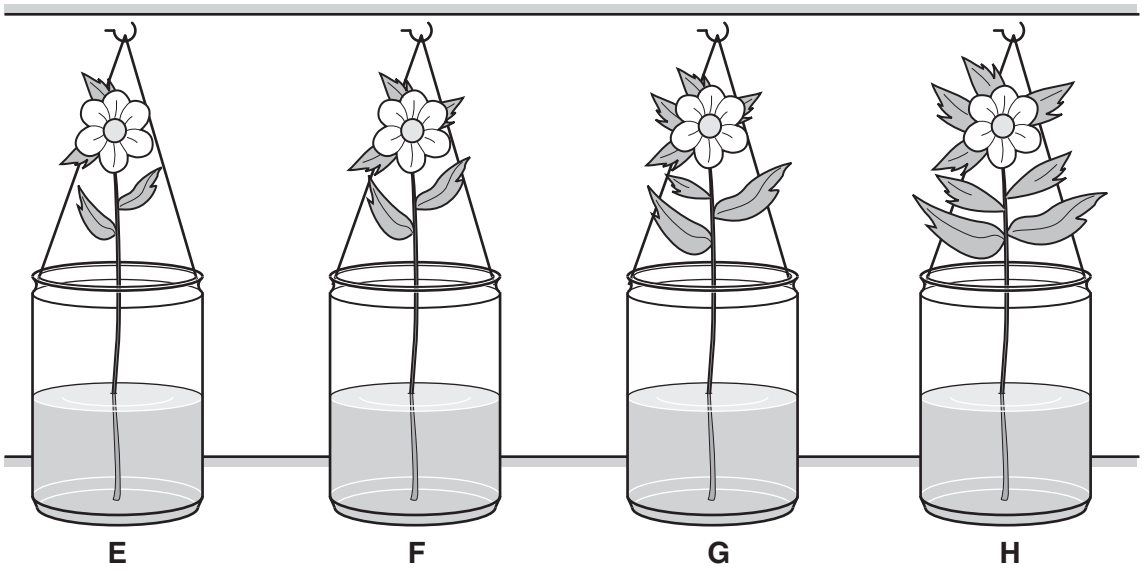

Fig. 3.1

(b) The volume of water remaining in jars **E**, **F**, **G** and **H** was measured at intervals between 6 am and 8 pm.

The results are shown in the graph in Fig. 3.2.

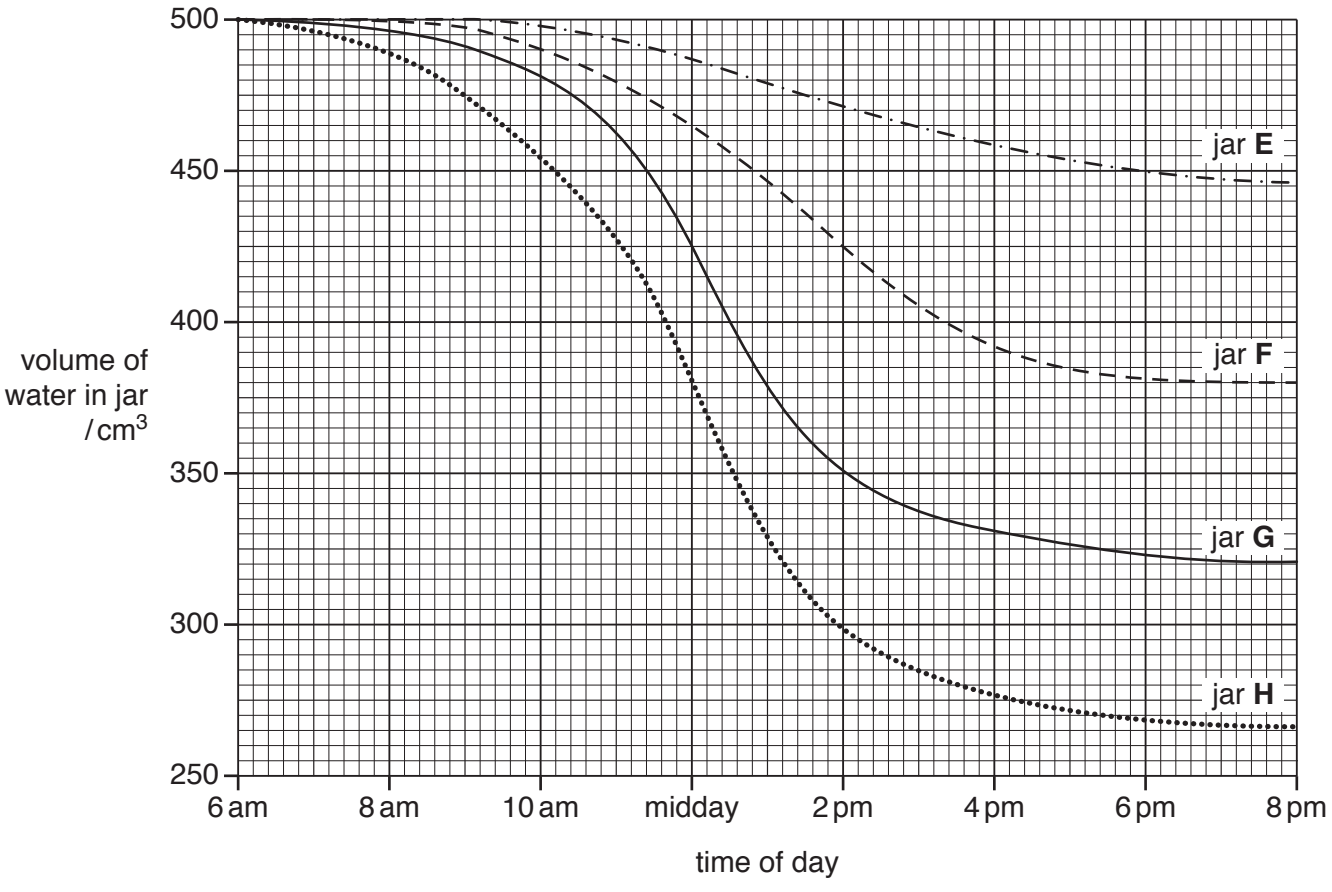

Fig. 3.2

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(i) Using data from Fig. 3.2, describe the changes in the volume of water in jar **H**. Suggest an explanation for these changes.

View solution

.....

.....

.....

.....

.....

.....

.....

.....

.....[4]

(ii) Calculate the difference between the volume of water in jars **G** and **H** at midday. Show your working.

View solution

..... cm^3
[1]

(iii) Using **only** information shown in Fig. 3.1, suggest a reason for the difference in water loss from jars **G** and **H**.

.....

.....

.....[1]

[Total: 10]

View solution

4 **(a)** State what is meant by the term *balanced diet*.

View solution

.....

.....

.....

.....

.....[2]

(b) Fig. 4.1 shows a pie chart of a person's diet.

View solution

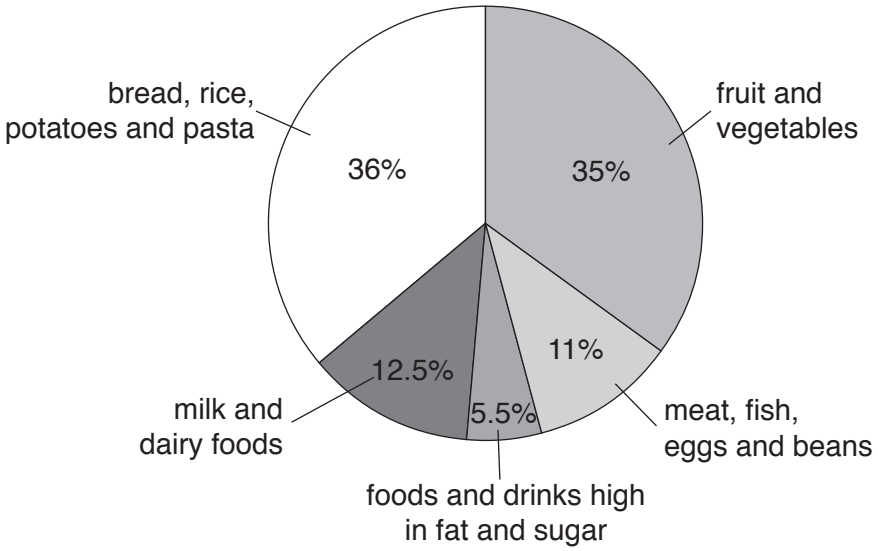

Fig. 4.1

(i) Bread, rice, potatoes and pasta form 36% of this diet.

Explain why these foods are important to the body.

.....

.....

.....

.....

.....[2]

(ii) State the foods shown in Fig. 4.1 that are rich in protein **and** state why proteins are important to the body.

.....

.....

.....

.....

.....[2]

(iii) Only 5.5% of this diet is made up of food and drinks that are high in fat and sugar.

Describe **one** harmful effect of eating too much fat.

.....

.....

.....[1]

(iv) The diet in Fig. 4.1 would **not** be suitable for everyone's needs.

State **and** explain **two** factors that could affect a person's dietary needs.

.....

.....

.....

.....

.....

.....

.....[4]

[Total: 11]

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5 Genetic engineering can be used to improve crops.

(a) Explain the meaning of the term *genetic engineering*.

View solution

.....

.....

.....

.....

.....[2]

Fig. 5.1 shows part of a newspaper article about a new variety of maize.



BUG-FREE MAIZE

Farmers lose a lot of their crops to insect pests each year. They have to spray their crops with insecticide to kill the insect pests. Now, scientists have developed a new variety of maize called Bt maize that contains its own insecticide.

Some kinds of bacteria make a natural insecticide called Bt. The scientists have taken the gene for this insecticide from the bacteria, and inserted it into maize plants.

Fig. 5.1

(b) (i) The new Bt maize contains a gene taken from bacteria.

View solution

Define the term *gene*.

.....

.....

.....

.....

.....[2]

(ii) Use the information in Fig. 5.1 to suggest how the addition of this gene could increase the farmer's maize crop.

.....

.....

.....

.....

.....[2]

(c) Maize plants are wind-pollinated.

View solution

(i) Describe what is meant by the term *pollination*.

.....

.....[1]

(ii) Fruit trees are pollinated by insects.

View solution

Suggest why growing Bt maize near to apple trees might reduce the yield of the fruit crop.

.....

.....[1]

(d) The development of Bt maize is one example of genetic engineering.

View solution

State **two other** examples of genetic engineering.

1 .....

.....

2 .....

.....

[2]

[Total: 10]

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6 Hormones play an important part in controlling the human body.

View solution

(a) Define the term *hormone*.

.....

.....

.....

.....

.....

.....

.....[3]

(b) Fig. 6.1 shows some parts of the human body where hormones are made.

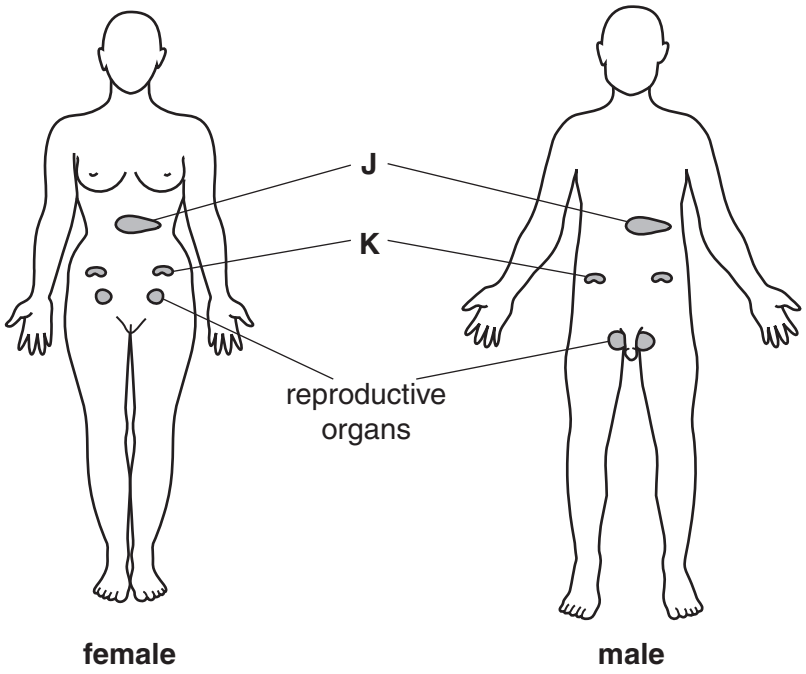

Fig. 6.1

(i) Complete Table 6.1 by identifying and naming each part and stating the name of a hormone produced by each of the parts.

Some examples have been done for you.

View solution

Table 6.1

part	name	hormone
J	.....	insulin
K	.....	adrenaline
reproductive organs	ovaries	.....
	.....	.....

[5]

(ii) Adrenaline increases the heart rate.

State **one** example of a situation when adrenaline is produced **and** suggest why this response is important.

.....

.....

.....

.....

.....[2]

[Total: 10]

View solution

7 The development of biological washing powders using enzymes from bacteria is an example of biotechnology.

(a) State **two** reasons why bacteria are useful in biotechnology, such as in the development of biological washing powders.

1 .....

.....

2 .....

.....

[2]

(b) Fig. 7.1 shows part of a label taken from a packet of '5 Star Bio' washing powder.

View solution

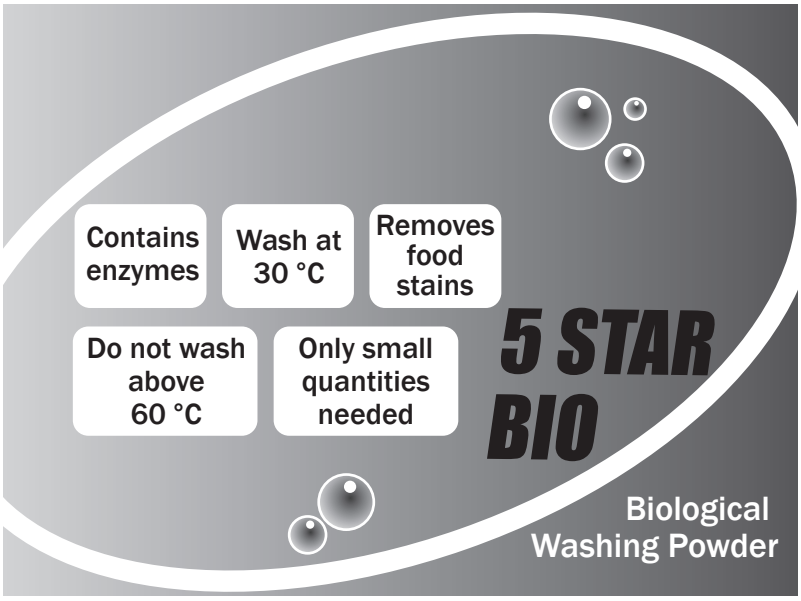

Fig. 7.1

Use the information shown in Fig. 7.1 to:

(i) explain how this washing powder removes food stains

.....

.....

.....

.....

.....[2]

(ii) explain why the manufacturer recommends washing at 30 °C and not above 60 °C

.....

.....

.....

.....

.....[2]

(iii) suggest why only small quantities of washing powder are needed to wash a large quantity of clothes.

.....

.....[1]

(c) Name an enzyme that could be used to remove fat stains from clothing.

.....[1]

[Total: 8]

View solution

8 Fig. 8.1 shows a drawing of a section through a human eye.

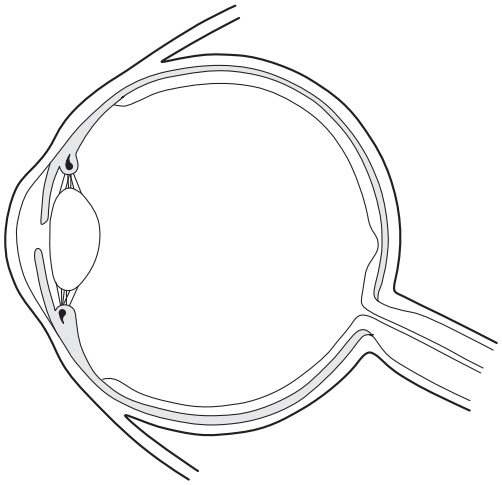

Fig. 8.1

View solution

(a) (i) On Fig. 8.1, label **and** name the part of the eye which focuses light to form a clear image. [2]

(ii) On Fig. 8.1, label **and** name the part of the eye where the image is formed. [2]

View solution

(b) Glaucoma is a disorder which affects the eyes.

Some forms of glaucoma can be inherited.

(i) What is meant by the term *inherited*?

.....

.....

.....[1]

View solution

(ii) Glaucoma can be caused by a recessive allele, **g**.

Explain the meaning of the terms:

recessive .....

.....

allele .....

.....

.....

[2]

(c) Fig. 8.2 shows part of a family tree in which some of the people have the type of glaucoma that is caused by the recessive allele, **g**.

View solution

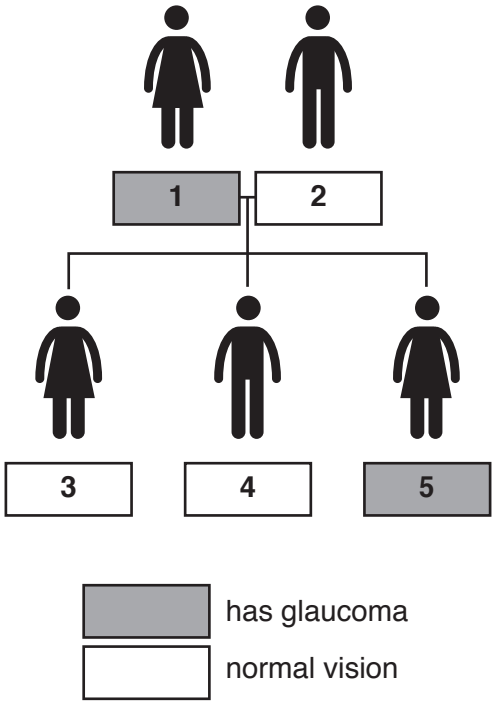

Fig. 8.2

Using **G** to represent the dominant allele and **g** to represent the recessive allele, complete the table to show the genotype of each member of the family.

person	genotype
1	.....
2	.....
3	.....
4	.....
5	.....

[3]

[Total: 10]

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9 **(a)** Fig. 9.1 shows a diagram of a sustainable fish farm.

View solution

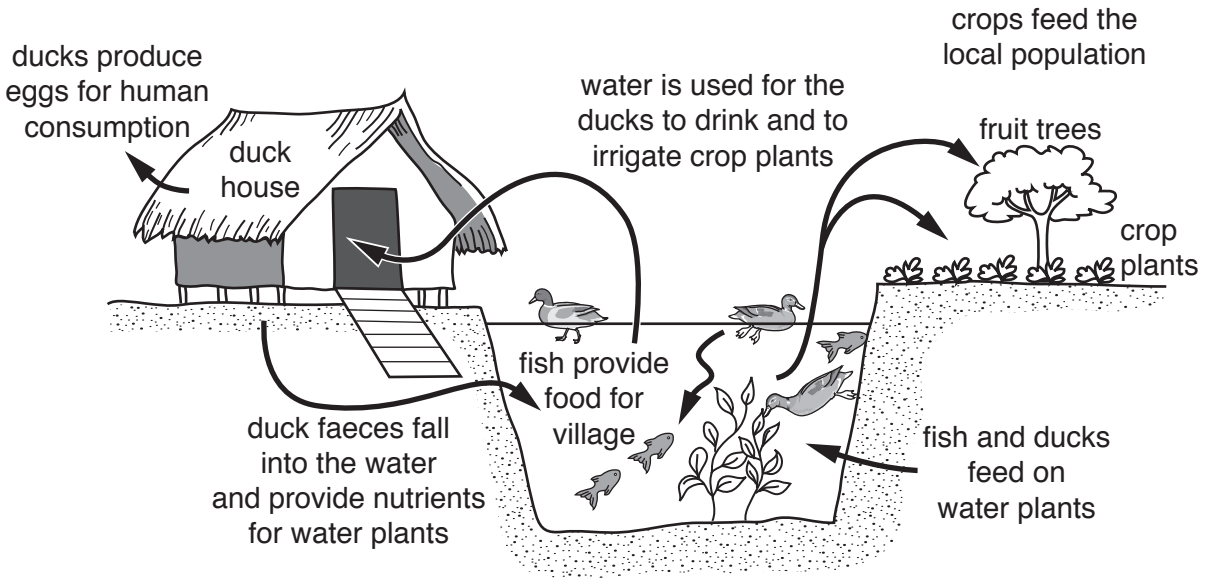


Fig. 9.1

(i) The fish grown in this fish farm are herbivores.

Define the term *herbivore*.

.....

.....[1]

(ii) Other organisms in the pond break down dead or decaying matter.

View solution

Name this group of organisms.

.....[1]

(iii) The method of fish farming shown in Fig. 9.1 is a good example of the conservation of resources.

View solution

Suggest **three** reasons for this statement.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

(b) Explain what is meant by a *sustainable resource*.

.....

.....

.....

.....

.....[2]

[Total: 7]

View solution

10 Fig. 10.1 shows an early stage in the birth of a baby.

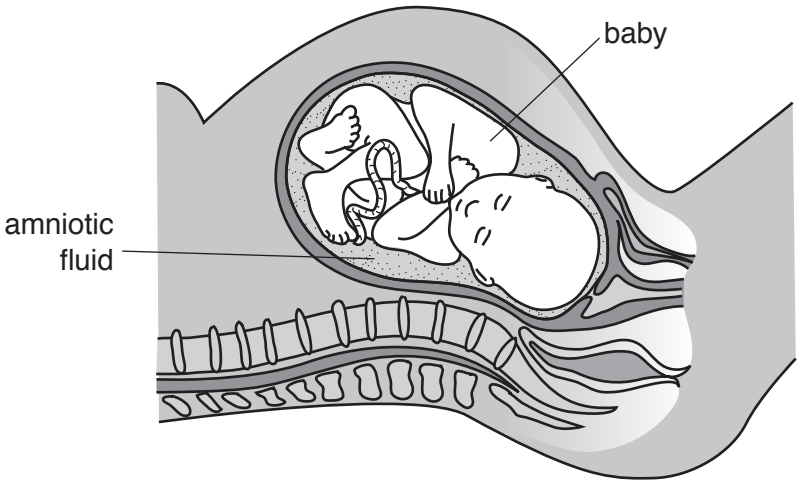


Fig. 10.1

View solution

(a) The unborn baby is surrounded by amniotic fluid.

Describe **one** function of this liquid.

.....

.....[1]

(b) The list describes six stages in the birth of a baby.

View solution

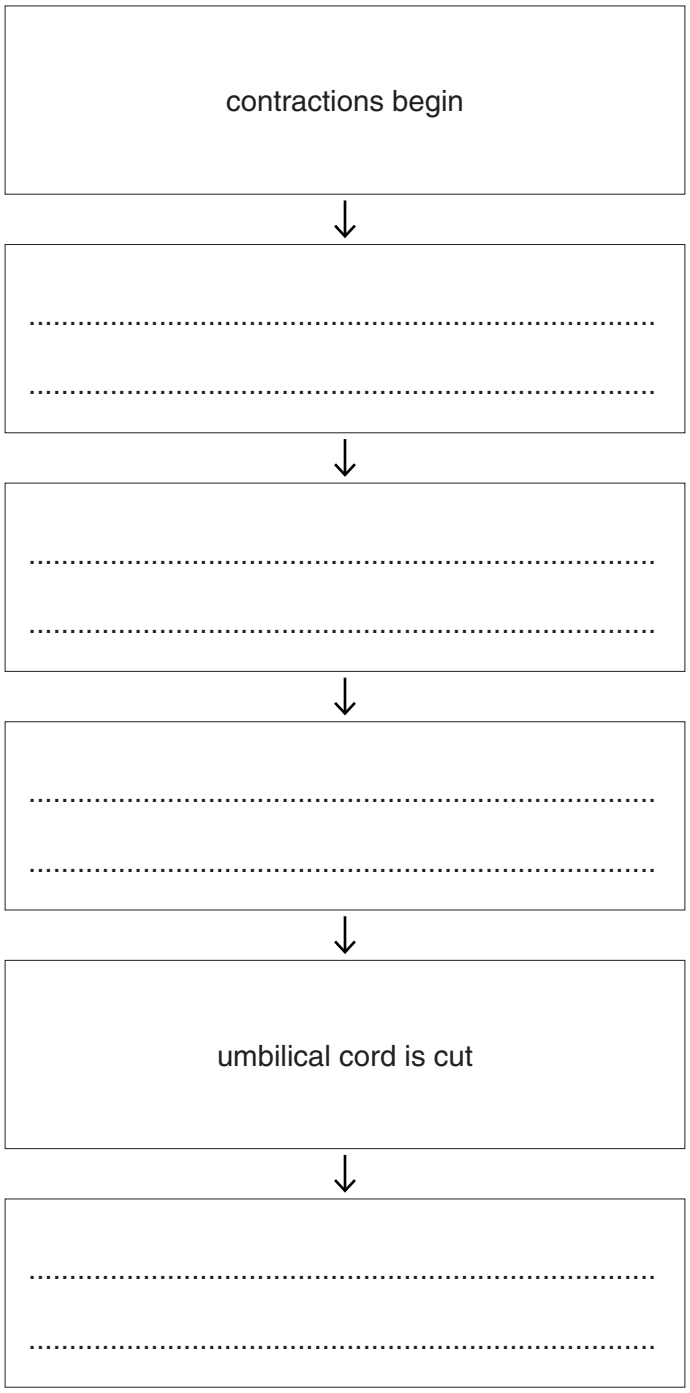
They are **not** in the correct order.

amniotic sac bursts **baby passes down vagina** **cervix dilates**

contractions begin **placenta delivered** **umbilical cord is cut**

Complete the boxes by writing the descriptions of the stages in the correct order.

Two of the stages have been completed for you.



[3]

[Total: 4]

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