Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

BIOLOGY **0610/33**

Paper 3 Theory (Core) **October/November 2017**

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.

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

This document consists of **20** printed pages.

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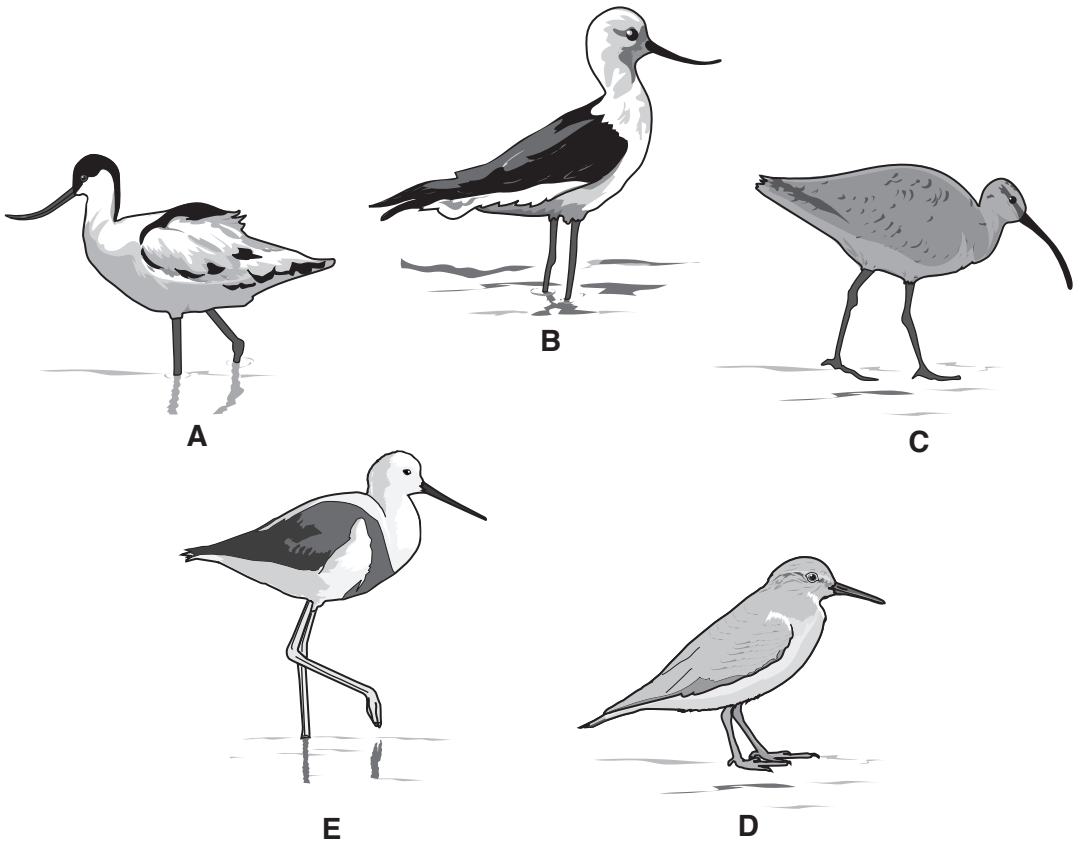
CAMBRIDGE International Examinations

1 Fig. 1.1 shows five species of birds that live near the water in habitats such as mudflats, marshes and shorelines.



not to scale

Fig. 1.1

(a) State **two** features that are characteristic of all birds.

View solution

1 .....

2 .....

[2]

(b) Fig. 1.2 is a key to identify the five birds in Fig. 1.1.

View solution

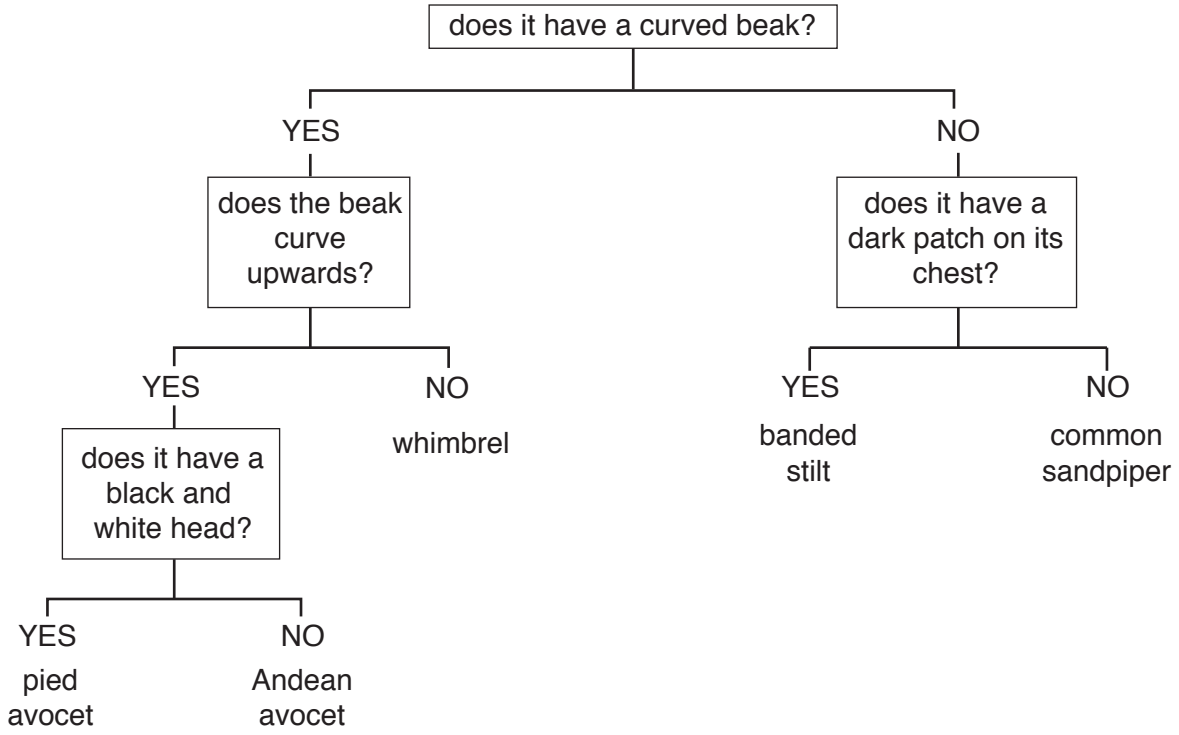


Fig. 1.2

Use the key to identify the five birds shown in Fig. 1.1.

Complete Table 1.1 by writing the letters **A**, **B**, **C**, **D** and **E** in the boxes next to the name of each bird.

Table 1.1

name of the bird	letter
pied avocet	
Andean avocet	
common sandpiper	
banded stilt	
whimbrel	

[4]

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(c) Bird **A** in Fig. 1.1 feeds mainly on small animals found in the mud or in the water.

View solution

It has long legs and a long beak.

(i) Suggest how these features help it to survive in its habitat.

.....

.....

..... [2]

(ii) State the name of the process that has produced birds with these features.

..... [1]

[Total: 9]

View solution

2 Fig. 2.1 shows the system that excretes excess water from the body.

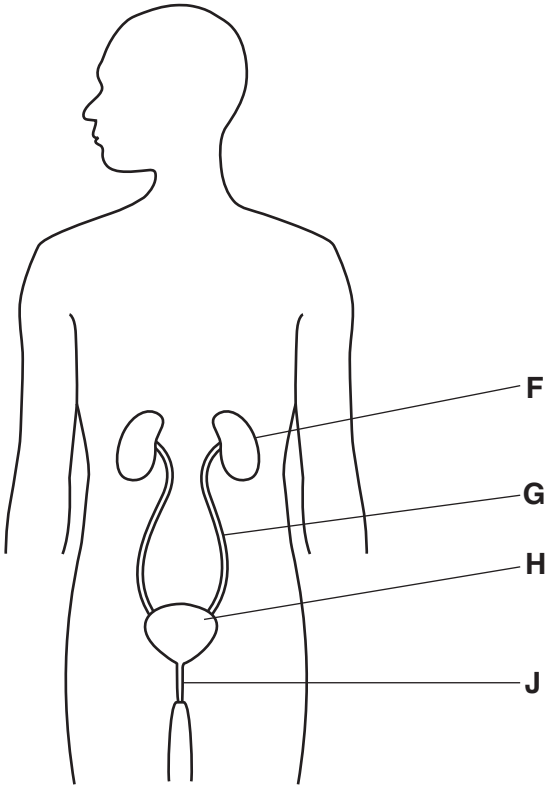

Fig. 2.1

(a) **(i)** Identify the letter on Fig. 2.1 that shows where urine is stored.

View solution

..... [1]

(ii) State the name of the organ where urine is stored.

View solution

..... [1]

(b) The ureter and the urethra are two parts of the organ system shown in Fig. 2.1.

View solution

Describe the function of these **two** structures.

ureter .....

.....

urethra .....

.....

[2]

(c) Urine contains urea.

View solution

(i) Circle the substance that is broken down to produce urea.

amino acids **fatty acids** **hydrochloric acid** **lactic acid** [1]

View solution

(ii) State the name of the organ that produces urea.

..... [1]

(d) A scientist compared the daily water intake and daily water loss from an athlete on two separate days.

View solution

The first set of results was collected on a day when the athlete was resting.

The second set of results was collected on the day of a long race.

The results are shown in Table 2.1.

Table 2.1

rest day				race day			
water input /cm^3		water loss /cm^3		water input /cm^3		water loss /cm^3	
respiration	400	faeces	100	respiration	500	faeces	100
food	500	skin	400	food	500	skin	.....
drink	1500	breathing	400	drink	.....	breathing	600
		urine	.....			urine	400
Total	.....	Total	2400	Total	3000	Total	3000

Calculate the four missing values in Table 2.1.

Write your answers on the dotted lines in Table 2.1.

[2]

View solution

(e) A person drinks a large volume of water but does not exercise.

Describe the effect that increased water intake would have on the volume and concentration of urine produced.

.....

.....

..... [2]

[Total: 10]

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3 **(a)** Drinking excessive alcohol, injecting heroin and smoking tobacco can all do serious harm to the body.

View solution

Table 3.1 shows some of the risks of using these substances.

Complete Table 3.1 by putting ticks in the boxes to show the possible risks of using these substances.

Table 3.1

action	chronic obstructive pulmonary disease	coronary heart disease	HIV infection	liver disease	lung cancer
drinking excessive alcohol					
injecting heroin					
smoking tobacco					

[3]

(b) Explain why many people find it difficult to stop smoking tobacco.

View solution

.....

.....

.....

.....

..... [2]

(c) A man and a woman drink the same volume of an alcoholic drink in 30 minutes.

View solution

Fig. 3.1 shows the change in their blood alcohol concentration over seven hours.

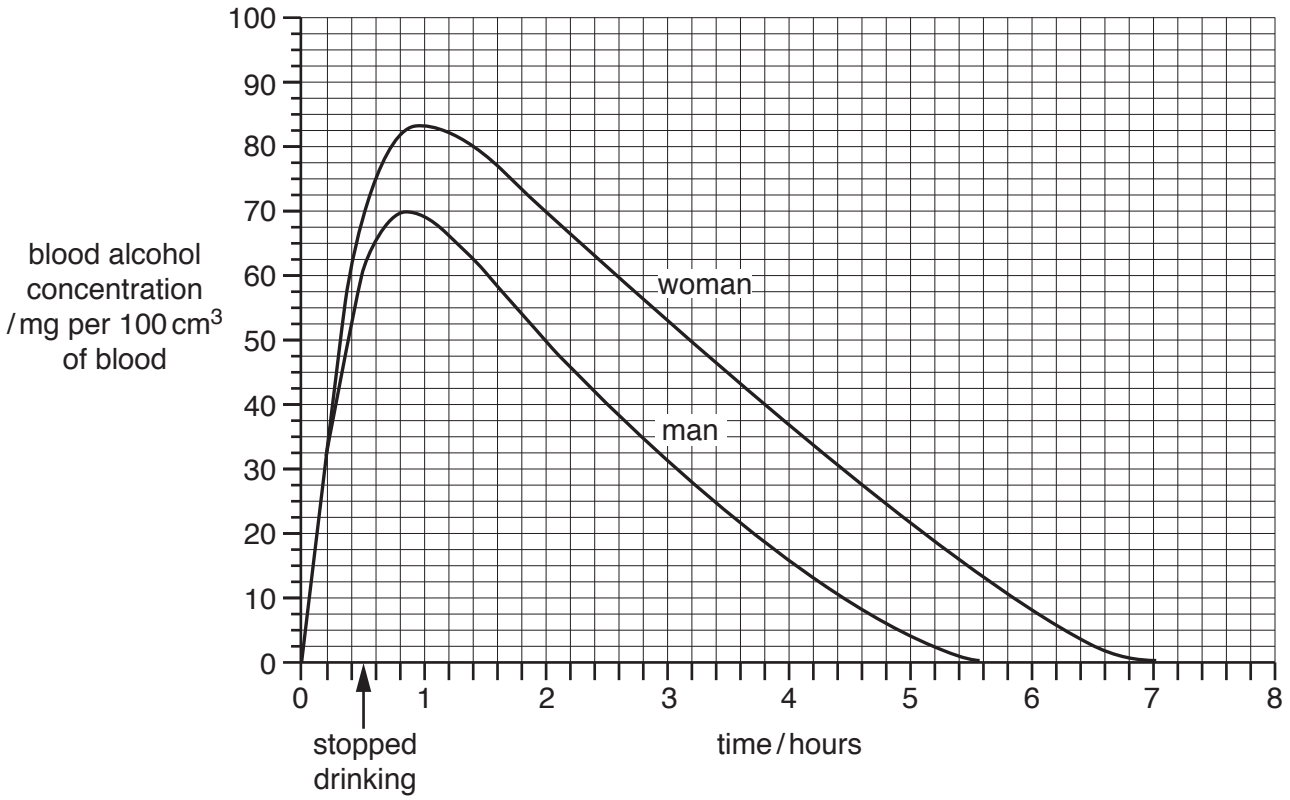

Fig. 3.1

(i) Describe **two** ways that the woman's blood alcohol concentration is different from the man's blood alcohol concentration in Fig. 3.1.

1 .....

.....

.....

2 .....

.....

.....

[2]

(ii) At two hours the blood alcohol concentration of the man was 50 mg per 100 cm^3 of blood.

State the blood alcohol concentration of the woman at two hours.

View solution

..... mg per 100 cm^3 of blood. [1]

(iii) Calculate the difference between the man's and the woman's blood alcohol concentrations at two hours, using your answer to part **3(c)(ii)**.

View solution

..... mg per 100 cm^3 of blood. [1]

(iv) Suggest **one** reason why the same volume of alcohol affected the man and the woman differently.

.....

.....

..... [1]

[Total: 10]

View solution

4 **(a)** The development of a new human life involves different stages.

View solution

These stages are labelled by the letters **A** to **G**.

The stages are **not** in the correct order.

A birth

B development of a fetus

C fertilisation

D formation of an embryo

E formation of a zygote

F implantation

G release of an egg cell

Put the seven stages in the correct order.

Write the letters in the spaces in the flow chart to show the correct order.

Two of the stages have been done for you.

..... → **C** → ..... → ..... → ..... → **B** → ..... [3]

(b) The list shows four different methods of birth control.

View solution

natural **chemical** **barrier** **surgical**

State the name of the method that these types of birth control belong to:

use of a condom .....

vasectomy .....

use of a contraceptive pill .....

[3]

(c) HIV is an example of a sexually transmitted infection.

View solution

(i) Define the term *sexually transmitted infection*.

.....

.....

..... [2]

(ii) State the name of the disease that HIV can lead to.

View solution

..... [1]

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(iii) Describe **one other** way that HIV can be transmitted.

.....

.....

..... [1]

[Total: 10]

View solution

5 **(a)** Most flowers contain male and female parts.

View solution

(i) State the name of the male gamete in plants.

..... [1]

(ii) State the name of the female gamete in plants.

View solution

..... [1]

(iii) State the name of the part of a flower that produces male gametes.

View solution

..... [1]

(iv) State the name of the part of a flower which receives the male gametes.

View solution

..... [1]

(b) Fig. 5.1 shows the flower of an aroid plant.

View solution

It is sometimes called the corpse flower because it smells of rotting meat.

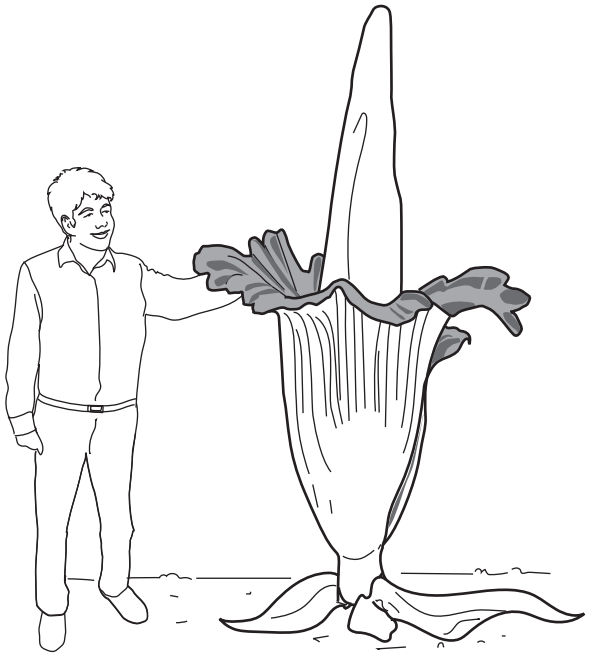

Fig. 5.1

The smell of the corpse flower attracts lots of insects.

The insects pollinate the flower.

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Describe **other** ways insect-pollinated flowers and wind-pollinated flowers are adapted for pollination.

insect-pollinated flowers .....

.....

.....

.....

wind-pollinated flowers .....

.....

.....

.....

[4]

(c) The seeds of the corpse flower are dispersed by birds.

View solution

The seeds germinate and new corpse flowers grow.

State **two** environmental conditions that a seed requires for germination.

1 .....

2 .....

[2]

[Total: 10]

6 **(a)** Explain why plants are the start of most food webs.

.....

.....

.....

.....

..... [3]

(b) Fig. 6.1 is a desert food web.

View solution

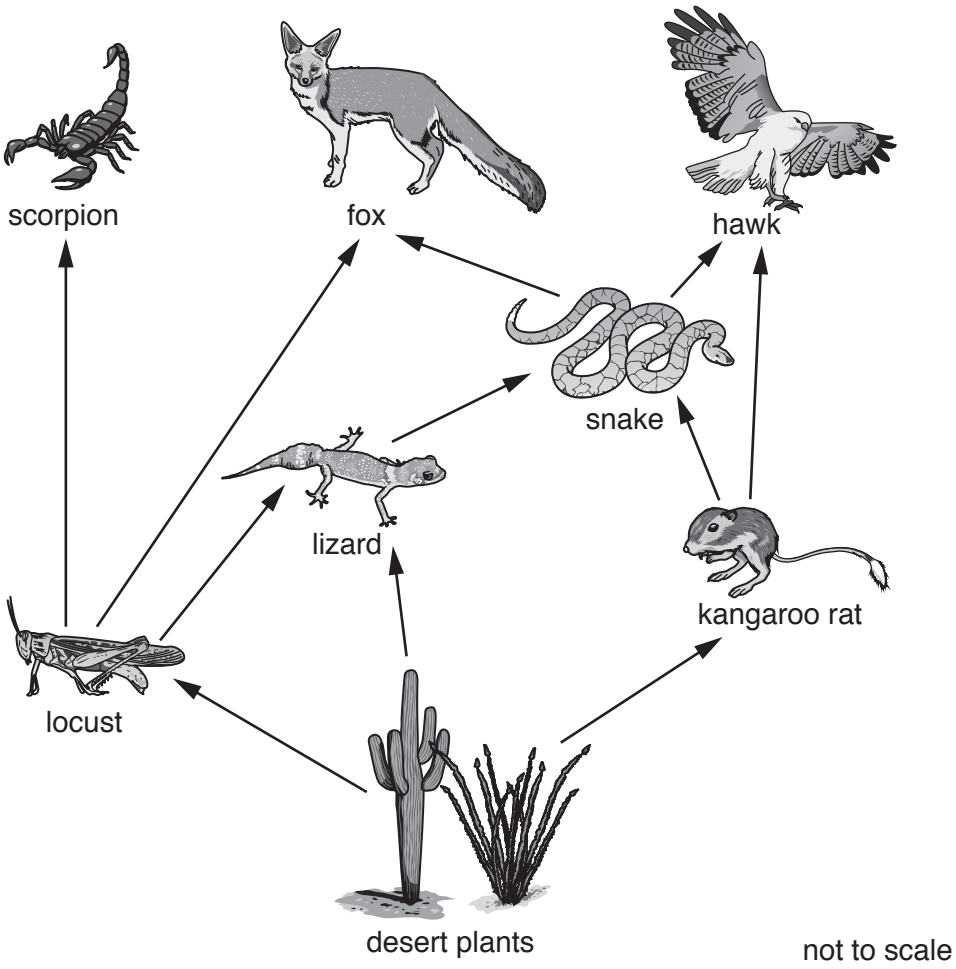

Fig. 6.1

(i) Use Fig. 6.1 to complete a food chain that has four different organisms and ends with the hawk.

Write the names of three missing organisms in the boxes.



[1]

(ii) State the names of **two** tertiary consumers in the food web in Fig. 6.1.

..... [2]

(c) The number of locusts in the food web in Fig. 6.1 suddenly decreases.

Explain what effect this would have on the population of scorpions and on the population of desert plants.

scorpions .....

.....

.....

.....

.....

desert plants .....

.....

.....

.....

.....

[4]

[Total: 10]

View solution

7 **(a)** The cells in the leaves of plants that make glucose contain a green substance.

View solution

(i) State the name of this green substance.

..... [1]

(ii) State the name of the cells that make glucose.

View solution

..... [1]

(b) Leaves contain different types of cells.

View solution

Fig. 7.1 represents a typical leaf.

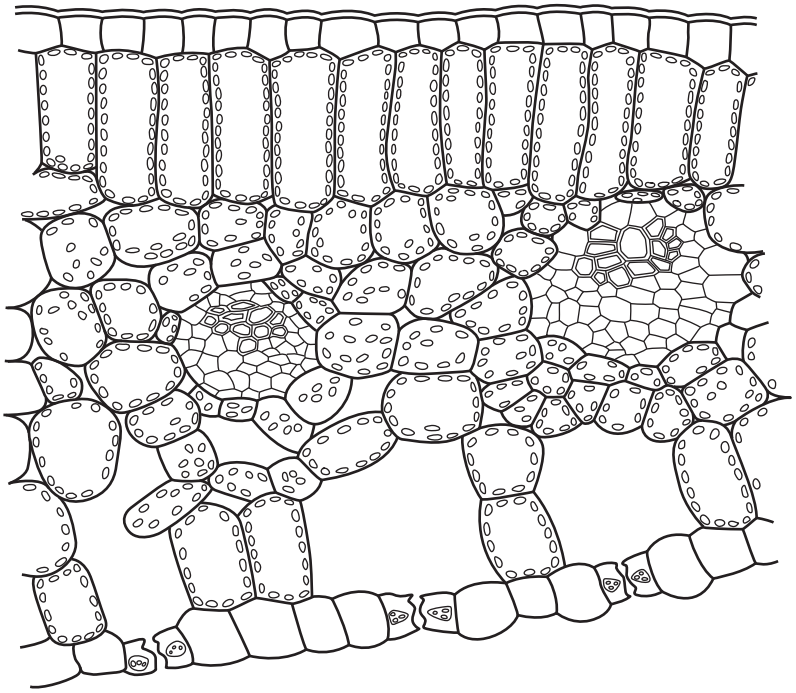

Fig. 7.1

(i) State the name of the thin, transparent layer of wax which covers the surface of most leaves.

..... [1]

(ii) State the name of the layer of cells that is beneath the layer of wax that covers the outer surface.

..... [1]

(c) Leaves contain two types of transport tissue, xylem and phloem.

View solution

State which substances are transported by:

xylem .....

phloem .....

[2]

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(d) The lower surface of most leaves has many pores.

View solution

The pores allow gases to move into and out of a leaf for photosynthesis.

(i) State the name of these pores.

..... [1]

(ii) State the name of the gas that is used for photosynthesis.

View solution

..... [1]

(iii) State the name of the gas that is produced by photosynthesis.

..... [1]

[Total: 9]

View solution

8 **(a)** A person with diabetes may be unable to make insulin.

View solution

(i) Insulin belongs to an important group of chemicals made by the body.

State the name of this group of chemicals.

..... [1]

(ii) State where insulin is produced in the body.

View solution

..... [1]

(iii) State the function of insulin.

View solution

.....

..... [1]

(b) A person with diabetes may need regular injections of insulin.

View solution

State how the insulin is transported to different parts of the body.

..... [1]

(c) Human insulin can be made by genetically engineered bacteria.

View solution

(i) Define the term *genetic engineering*.

.....

.....

..... [2]

(ii) State **one** example of genetic engineering in crop plants.

View solution

.....

..... [1]

[Total: 7]

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9 Fig. 9.1 shows a cross between two guinea pigs. The male guinea pig is pure-breeding for black fur colour and the female guinea pig is pure-breeding for white fur colour.

The allele for black fur colour can be represented by **B** and the allele for white fur colour can be represented by **b**.

All four of their offspring had black fur.

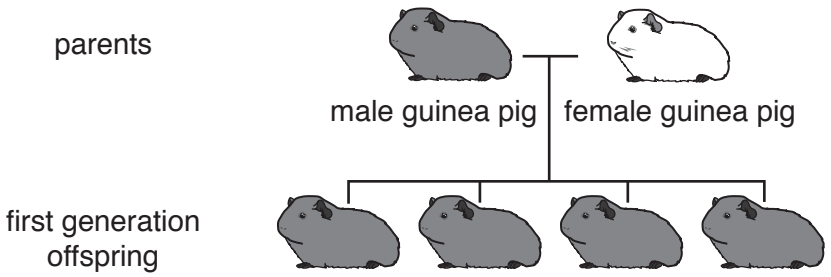

Fig. 9.1

(a) (i) State the phenotypes of each of the parent guinea pigs in Fig. 9.1.

View solution

phenotype of the male .....

phenotype of the female .....

[1]

(ii) State the genotype of the female parent guinea pig.

View solution

..... [1]

(iii) All of the offspring are heterozygous.

State the genotype of the heterozygous offspring.

View solution

..... [1]

(b) Two of the first generation offspring were crossed.

They produced four second generation offspring.

These are labelled **A**, **B**, **C** and **D** in Fig. 9.2.

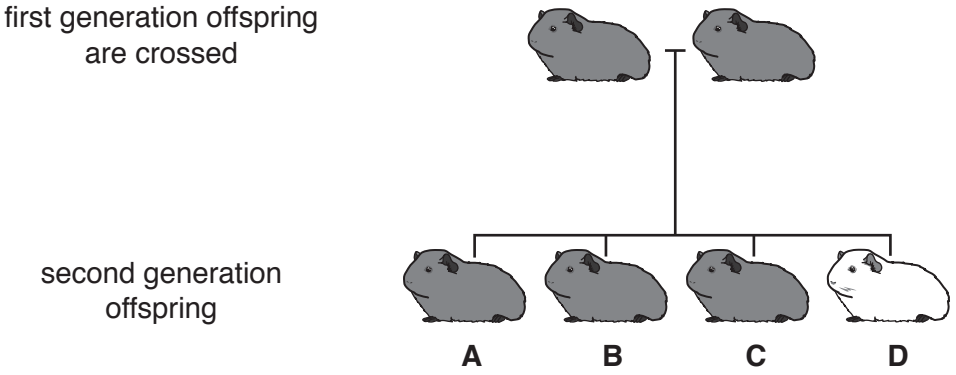

Fig. 9.2

(i) State **all** of the possible genotypes for the three offspring labelled **A**, **B** and **C**.

..... [1]

(ii) State the phenotypic ratio of the second generation of guinea pigs.

..... [1]

[Total: 5]

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