Cambridge IGCSE

Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

BIOLOGY **0610/31**

Paper 3 Theory (Core) **May/June 2019**

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 regulated for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

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1 **(a)** The boxes on the left contain the names of flower parts.

View solution

The boxes on the right contain descriptions of the functions of the flower parts.

Draw **one** straight line from each box on the left to **one** box on the right to link the flower part to its function.

Draw **five** lines.

flower part	function
anther	attracts insects
ovary	place where pollen has to land
petal	produces ovules
sepal	produces pollen
stigma	protects the flower bud
	transports water

[5]

(b) Pollen grains from wind-pollinated flowers and insect-pollinated flowers are different.

State **two** ways in which a pollen grain from a wind-pollinated flower is different to a pollen grain from an insect-pollinated flower.

1 .....

2 .....

[2]

View solution

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(c) Complete the sentences about seeds.

View solution

Use words from the list.

Each word may be used once, more than once, or not at all.

asexual	**carbon dioxide**	**gravity**	**hormones**
light	**mineral ions**	**oxygen**	**sexual**
vitamins	**water**		

Plants produce seeds as a result of ..... reproduction. Seeds germinate if they have the correct conditions. These conditions include a suitable temperature and also ..... and ..... .

The germinating seed produces a young root which grows downwards in response to ..... .

The young root absorbs ..... and ..... from the soil as well as keeping the young plant in a stable position.

[6]

[Total: 13]

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2 **(a)** Table 2.1 shows the names of three groups of arthropods and some of their characteristics.

Place ticks (✓) in the boxes to show the characteristics present in each group.

View solution

Table 2.1

characteristic	arthropod group		
	arachnids	crustaceans	myriapods
four pairs of legs			
one pair of antennae			
body divided into two main parts			

[3]

(b) All living organisms show the same seven characteristics.

View solution

State **four** of the characteristics of living organisms.

1 .....

2 .....

3 .....

4 .....

[4]

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(c) Fig. 2.1 shows the apparatus used by some students during an investigation.

View solution

The apparatus is drawn as seen from above.

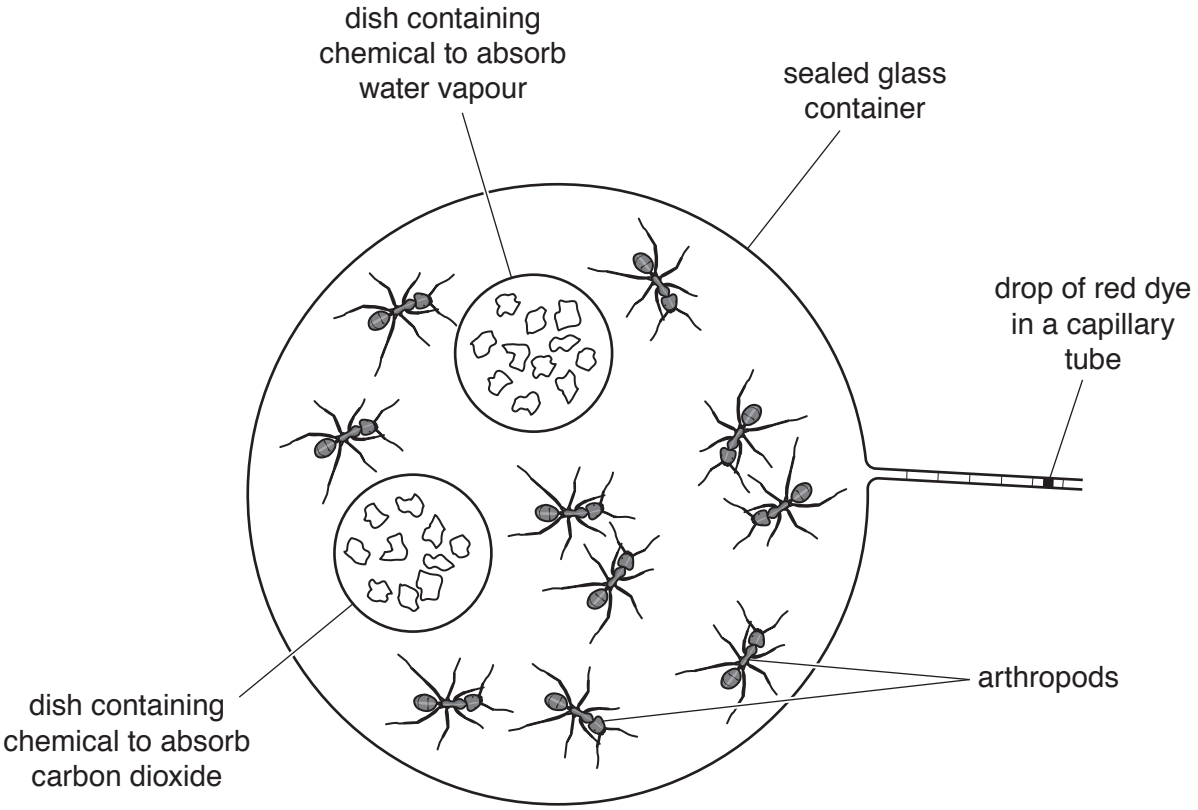

Fig. 2.1

Some arthropods were placed in the container.

A drop of red dye was inserted into the capillary tube.

The drop of red dye in the capillary tube gradually moved towards the arthropods.

(i) Explain why the drop of red dye moved towards the arthropods.

.....

.....

.....

.....

.....

..... [3]

The investigation shown in Fig. 2.1 was repeated at different temperatures.

Fig. 2.2 shows the results.

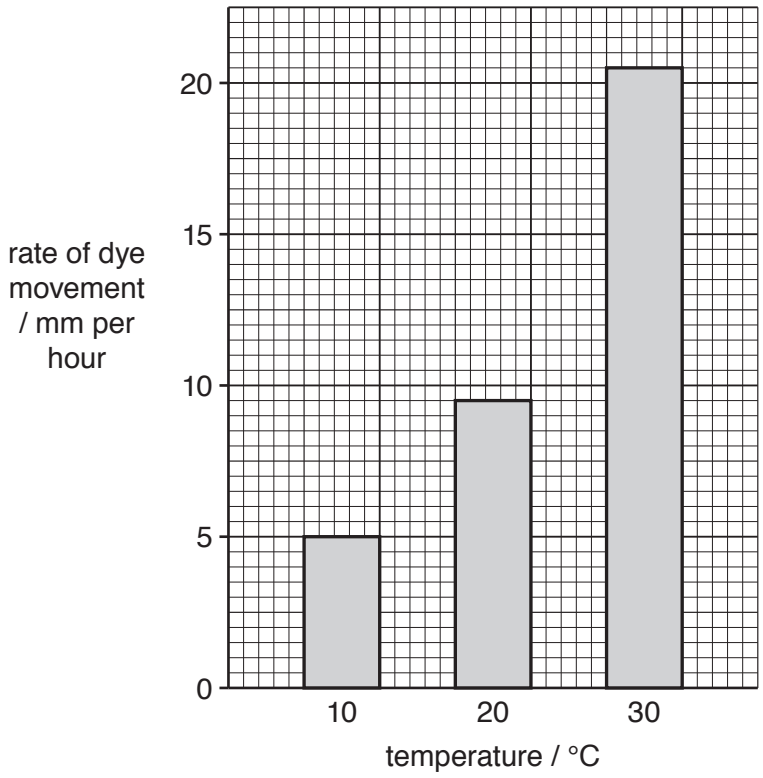

Fig. 2.2

(ii) State the trend shown in Fig. 2.2.

View solution

.....

..... [1]

(iii) Calculate the percentage increase in the rate of dye movement between 10 °C and 20 °C.

Show your working.

View solution

.....%
[2]

[Total: 13]

3 Fig. 3.1 is a diagram of the alimentary canal and associated organs.

Some parts are identified by letters.

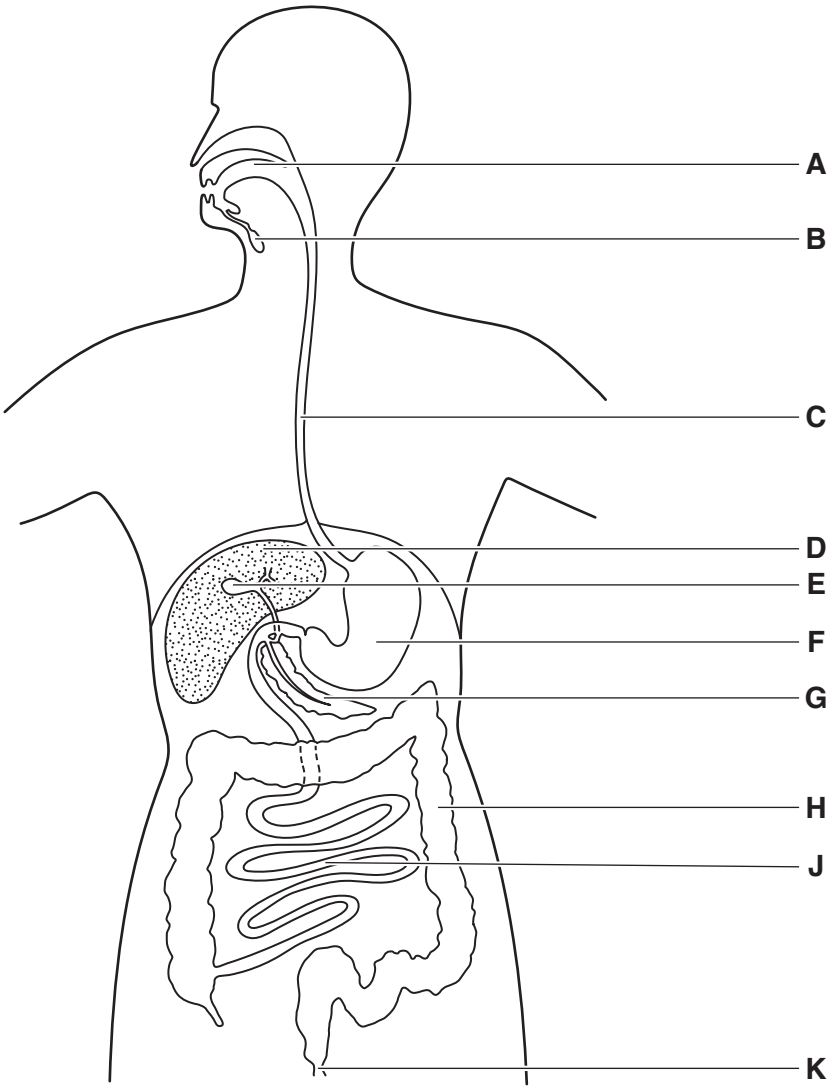

Fig. 3.1

(a) Complete Table 3.1 by inserting the letter from Fig. 3.1 which identifies the part that carries out the function described.

View solution

Table 3.1

description of function	letter in Fig. 3.1
where egestion takes place	
where lipase is made	
where mechanical digestion occurs	
where the **most** water is absorbed	

[4]

(b) Cholera is a transmissible disease.

View solution

(i) State the type of pathogen that causes cholera.

..... [1]

View solution

(ii) One of the symptoms of cholera is diarrhoea.

Describe what is meant by the term *diarrhoea*.

.....

..... [1]

View solution

(iii) Outline the treatment for diarrhoea.

.....

.....

.....

.....

..... [2]

View solution

(c) State **two** ways in which the body can defend itself against pathogens.

1 .....

2 .....

[2]

[Total: 10]

View solution

4 **(a)** Fig. 4.1 is a diagram of a palisade mesophyll cell.

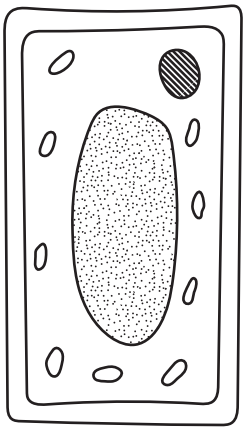

Fig. 4.1

Identify and label the nucleus and a chloroplast on Fig. 4.1. [2]

(b) Fig. 4.2 shows the same palisade mesophyll cell after it has been placed in a concentrated sugar solution for twenty minutes.

View solution

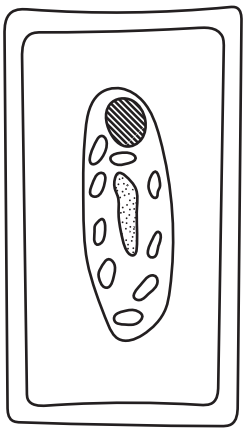

Fig. 4.2

(i) Describe the changes that have taken place in the cell between Fig. 4.1 and Fig. 4.2.

.....

.....

.....

.....

..... [2]

(ii) Explain why the cell in Fig. 4.2 has changed.

View solution

.....

.....

.....

.....

.....

.....

..... [3]

(iii) Suggest how the cell in Fig. 4.2 could be treated so that it returned to its original appearance in Fig. 4.1.

.....

..... [1]

View solution

(c) (i) State the name of the tissue that transports water up the stem and into a leaf in a plant.

..... [1]

View solution

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(ii) Fig. 4.3 shows drawings of sections through a root, a stem and part of a leaf in a dicotyledonous plant.

View solution

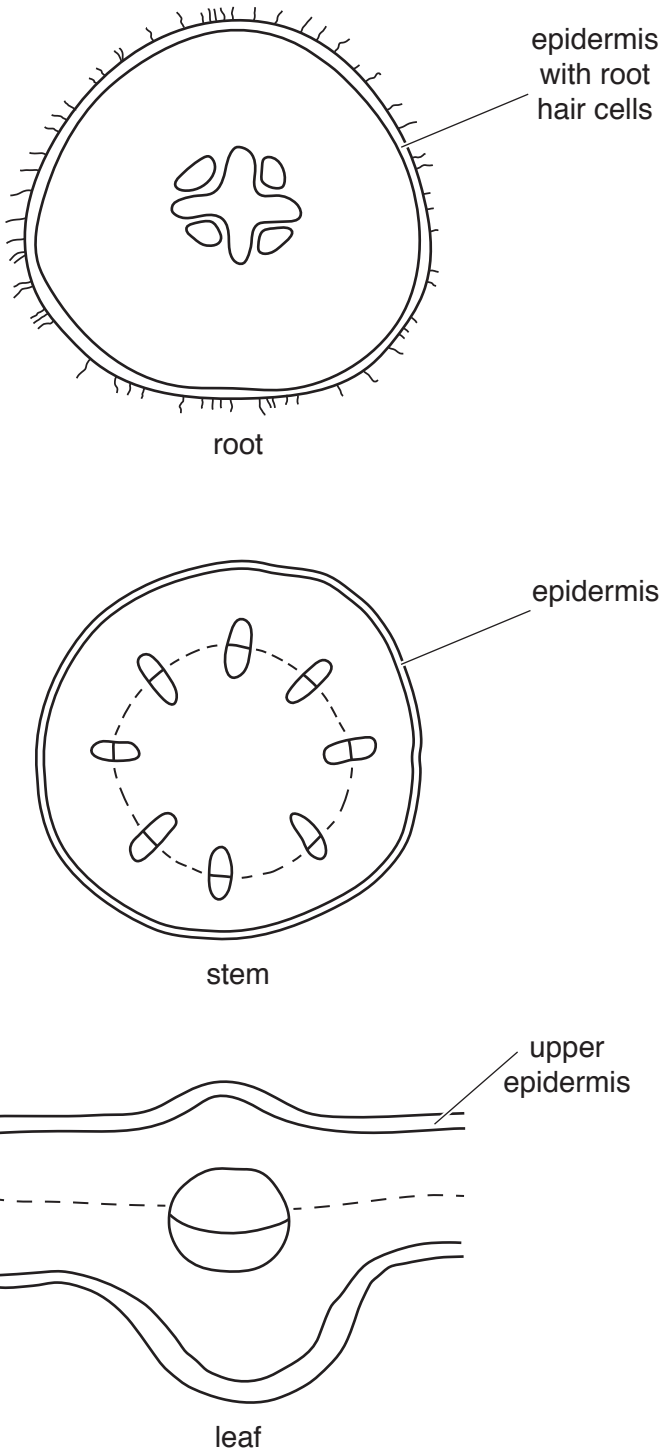

Fig. 4.3

Identify and label with the letter **W**, the position of the water transport tissue in each of the root, the stem and the leaf, on Fig. 4.3. [3]

[Total: 12]

5 **(a)** Rabbits are herbivores.

View solution

Define the term *herbivore*.

.....

..... [2]

(b) The size of a rabbit population can increase and decrease from year to year, as shown in Fig. 5.1.

View solution

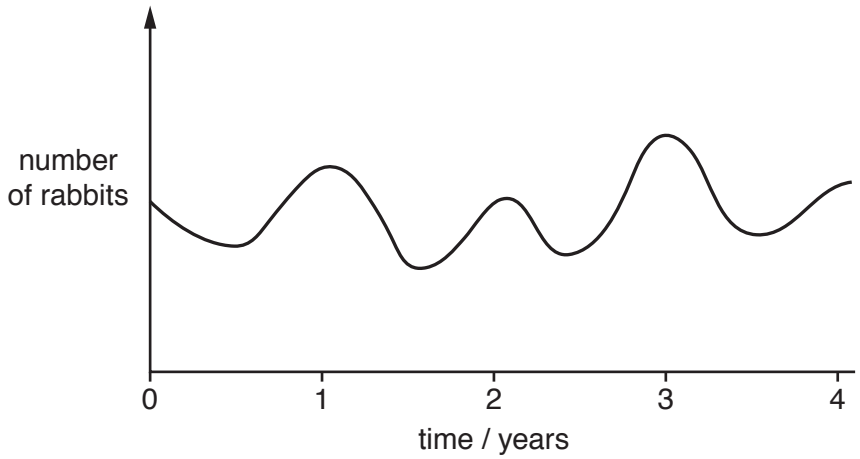

Fig. 5.1

State **two** factors that could cause an increase in a rabbit population.

1 .....

.....

2 .....

.....

[2]

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(c) Since 1800 the population of humans in the world has increased dramatically.

State **three** ways in which this increase in the human population has affected marine ecosystems.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

[Total: 7]

View solution

6 **(a)** Complete the sentences by stating the part of the human body that produces male gametes and the part that produces female gametes.

Male gametes are produced by the .....

Female gametes are produced by the .....
[2]

(b) Fig. 6.1 represents the early stages in the development of a female embryo.

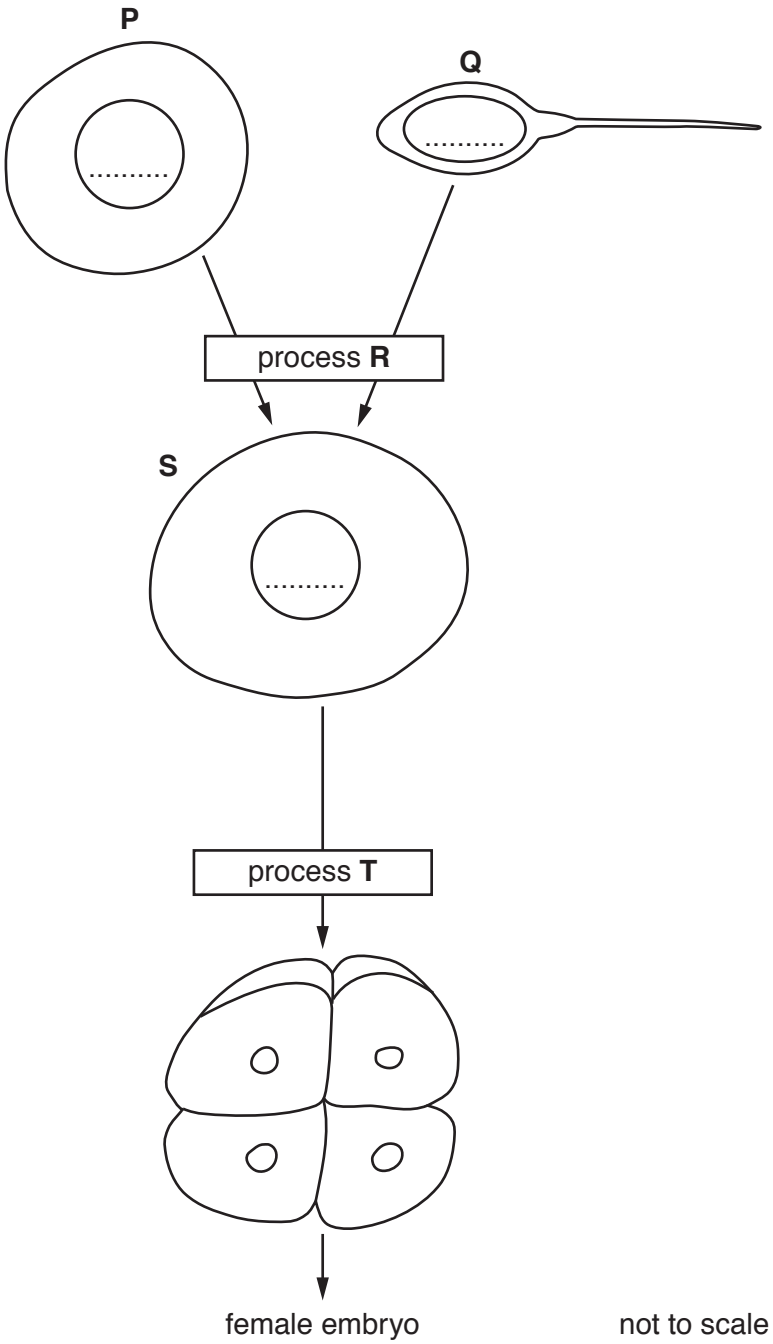

Fig. 6.1

(i) State the names of the cells labelled **P**, **Q** and **S** in Fig. 6.1.

View solution

P .....

Q .....

S .....

[3]

(ii) Complete Fig. 6.1 by writing the correct sex chromosomes in structures **P**, **Q** and **S**. [3]

(iii) State the names of processes **R** and **T** in Fig. 6.1.

R .....

T .....

[2]

(iv) State the name of the organ in the body in which the female embryo develops.

..... [1]

(c) Some people do not want to have a baby and so use a method of contraception.

View solution

Complete Table 6.1 by writing an example for each method of contraception.

Table 6.1

method of contraception	example of contraceptive method
natural	
barrier	
chemical	
surgical	

[4]

[Total: 15]

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7 Blood circulates round the body in arteries, veins and capillaries.

(a) Place ticks (✓) in the correct boxes in Table 7.1 to show the features of arteries.

View solution

Table 7.1

structure and function	arteries
carries blood at high pressure	
carries blood towards the heart	
has a thick wall	
has a narrow lumen	
has valves present throughout the vessel	

[3]

(b) Fig. 7.1 shows a photomicrograph of a capillary with red blood cells passing through it.

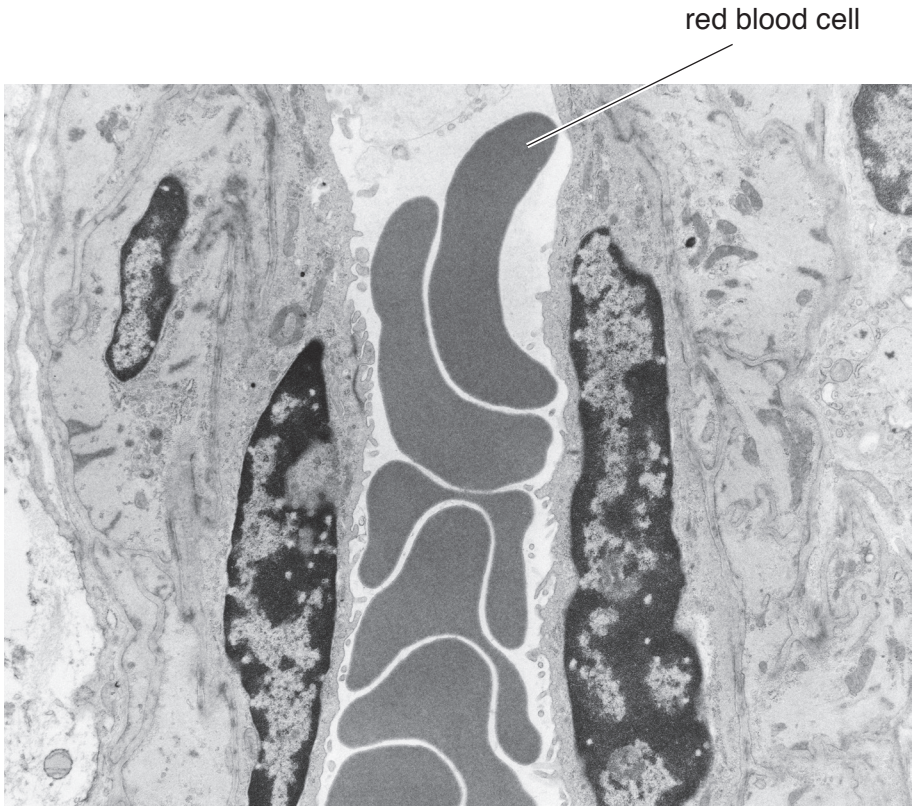

Fig. 7.1

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(i) State the function of the red blood cells shown in Fig. 7.1.

View solution

.....

..... [1]

(ii) Red blood cells are one component of blood.

View solution

State the name of **two** other components of blood.

1 .....

2 .....
[2]

[Total: 6]

8 Fig. 8.1 shows a cat with an inherited condition that means the cat has extra toes.

View solution



Fig. 8.1

The allele that causes this condition is dominant to the allele for the normal condition.

Fig. 8.2 shows the inheritance of this condition in a family of cats.

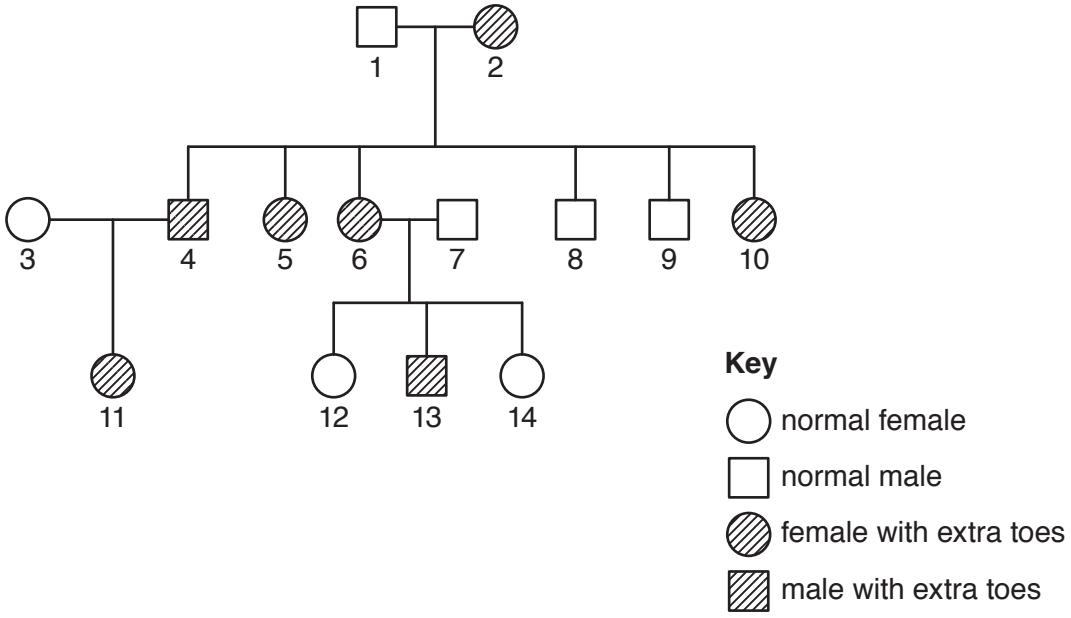

Fig. 8.2

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Complete Table 8.1 by stating the genotypes of the numbered individuals.

Use **B** for the dominant allele and **b** for the recessive allele.

Table 8.1

number of individual in Fig. 8.2	genotype of individual
1	
2	
4	
14	

[4]

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