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Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME	
CENTRE NUMBER	
CANDIDATE NUMBER	

BIOLOGY **0610/23**

Paper 2 Core **May/June 2015**

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 **19** printed pages and **1** blank page.

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CAMBRIDGE International Examinations

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1 Fig. 1.1 shows four different animals.

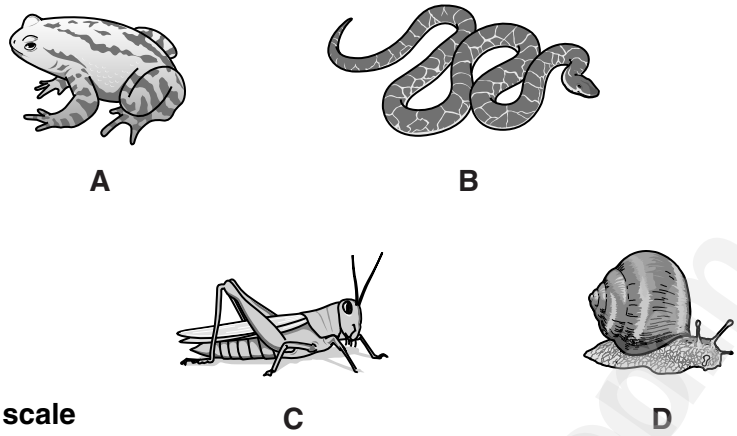

Fig. 1.1

(a) Classify each animal into its correct group choosing words from this list.

Write your answers in the '**group**' column of Table 1.1.

amphibian **bird** **fish** **insect** **mammal** **mollusc** **reptile**

[1]

One example has been completed for you.

Table 1.1

	group	feature 1	feature 2
A	amphibian	has a backbone	has slimy skin
B			
C			
D			

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(b) Using phrases from the list, complete Table 1.1 by adding **two** features of each animal group, as shown for amphibians.

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

has no backbone **has a backbone** **has feathers** **has fur**

has gills **has scaly skin** **has slimy skin** **has a shell**

has 8 legs **has 6 legs**

[3]

[Total: 4]

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2 Fig. 2.1 shows a section through the human heart.

Chamber **A** collects deoxygenated blood from the body.

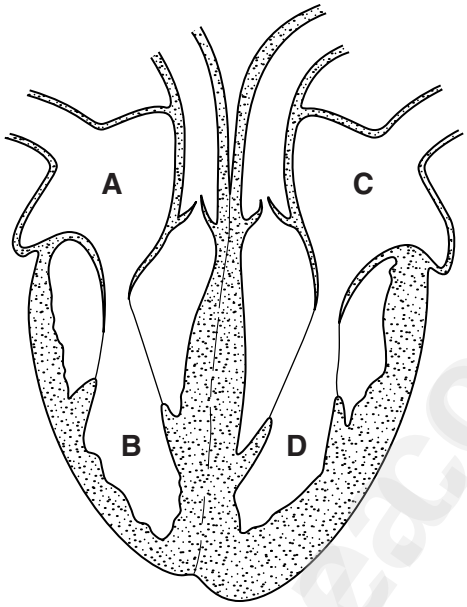

Fig. 2.1

(a) **(i)** State the name of chamber **B**.

.....[1]

(ii) State which organ the blood goes to after it leaves chamber **B**.

.....[1]

(iii) Blood can contain different concentrations of carbon dioxide and oxygen.

Tick (✓) the boxes that describe the blood found in chamber **C**.

high concentration of carbon dioxide	☐
low concentration of carbon dioxide	☐
high concentration of oxygen	☐
low concentration of oxygen	☐

[1]

(iv) Name the tissue that makes up the wall of chamber **D**.

.....[1]

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(b) The heart contains a number of valves.

(i) Draw a line on Fig. 2.1 to identify **one** of the valves.
Label this line with a **V**. [1]

(ii) State the function of the valves in the heart.

.....

.....

.....[1]

(c) **(i)** Suggest **two** ways in which the heartbeat changes when a person exercises.

1 .....

.....

2 .....

.....
[2]

(ii) The coronary artery supplies blood to the heart tissue. People with coronary heart disease (CHD) are unable to do much exercise.

State a cause of CHD and explain why people with this disorder are unable to do much exercise.

cause .....

.....

explanation .....

.....

.....

.....
[3]

[Total: 11]

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3 **(a)** Complete the sentences about enzymes by filling in the gaps.
Use words or phrases from the list.

catalysts **hormones** **not changed**

prevent **protein** **slow down**

speed up **used up**

Enzymes are made of ..... molecules.

They function as ..... which means that they .....

chemical reactions. [3]

(b) Saliva contains an enzyme that digests starch.

A group of students used saliva to investigate the digestion of starch at different pH values.

Their results are shown in Fig. 3.1.

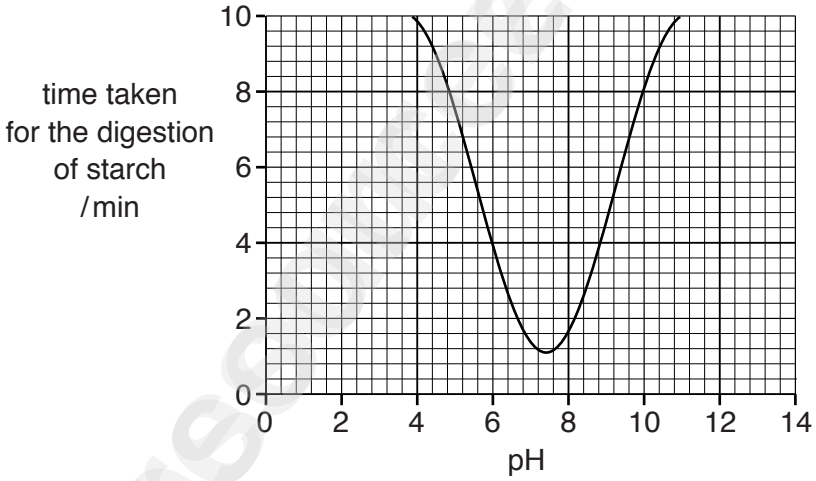

Fig. 3.1

(i) At which pH does the enzyme in saliva work the fastest?

..... [1]

(ii) How long does it take for the starch to be digested at pH 6?

..... min [1]

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(iii) The stomach produces hydrochloric acid.

Use the graph to suggest why the enzyme found in saliva does not work inside the stomach.

.....

.....

.....

.....

.....[2]

(iv) Name the enzyme that digests starch and state where this enzyme is produced.

name of enzyme .....

where produced .....
[2]

(c) Name **one** factor, other than pH, which can change the rate of enzyme activity.

.....[1]

[Total: 10]

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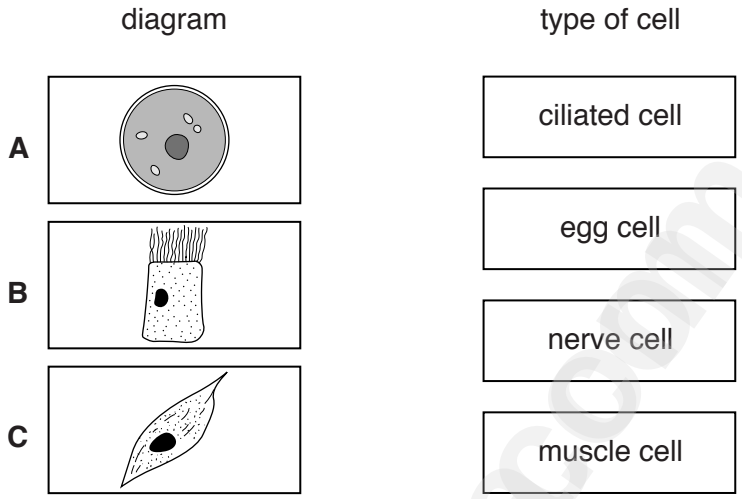
4 **(a)** Fig. 4.1 shows diagrams of three types of cell found in the female reproductive system.

Draw **one** straight line to join each diagram to the correct type of cell.



not drawn to scale

Fig. 4.1 [3]

(b) Cell **B** is found on the insides of the oviducts.
This type of cell is also found on the insides of the air passages leading to the lungs.

(i) Describe the function of these cells in the air passages leading to the lungs.

.....

.....

.....

.....

.....[2]

(ii) Suggest why these cells are present in the oviducts.

.....

.....[1]

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(c) Fig. 4.2 shows the organs in the female reproductive system.

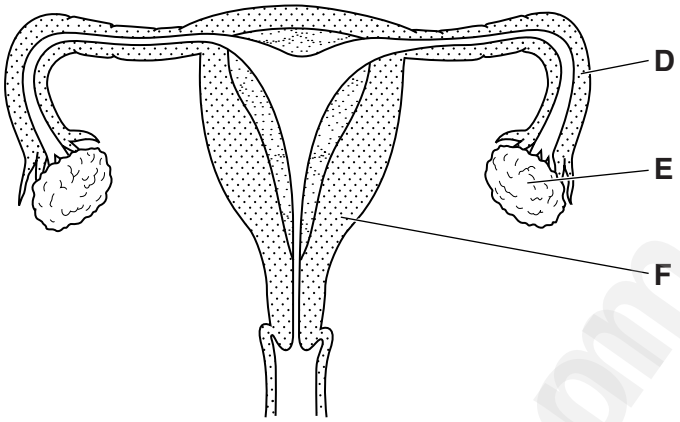

Fig. 4.2

(i) Identify the parts labelled **D**, **E** and **F**. Choose words from the list.

cervix **ovary** **oviduct** **uterus** **vagina**

D .....

E .....

F ..... [3]

(ii) On Fig. 4.2 draw an **X** to show where sperm are released during sexual intercourse. [1]

(d) Fig. 4.3 shows a sperm cell. The tail can be moved from side to side.

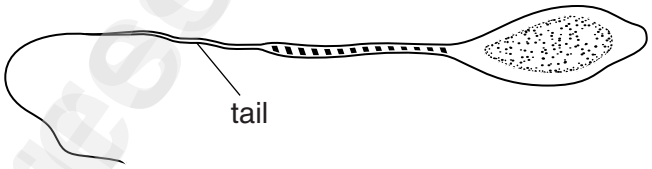

Fig. 4.3

Suggest why the tail is important for reproduction.

.....

.....

.....

.....

.....[2]

[Total: 12]

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5 **(a)** Complete Table 5.1 to show which statements are true for diffusion and which are true for osmosis. Use a tick (✓) if it is true or a cross (✗) if it is false.

Complete all eight boxes.

Table 5.1

statement	diffusion	osmosis
must involve a partially permeable membrane		
involves the movement of gases and solutes		
is a result of the random movement of particles		
requires energy from respiration		

[4]

(b) Fig. 5.1 shows a small bag of coloured salts placed in a beaker of warm water.

After a few minutes, the water changes colour. This is shown in Fig. 5.1.

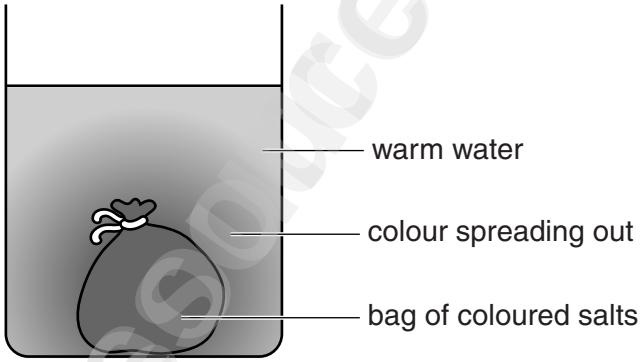

Fig. 5.1

Use Fig. 5.1 to help explain how tissues obtain oxygen from the blood.

.....

.....

.....

.....

.....[2]

[Total: 6]

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6 **(a)** A plant develops seeds and fruit after pollination has occurred.

Name **one** agent of pollination.

.....[1]

(b) State **one** reason why fruit and seed dispersal is important for plants.

.....

.....

.....[1]

(c) Fig. 6.1 shows the fruiting body of a dandelion plant and a single fruit. The fruiting body is made of many single fruits.

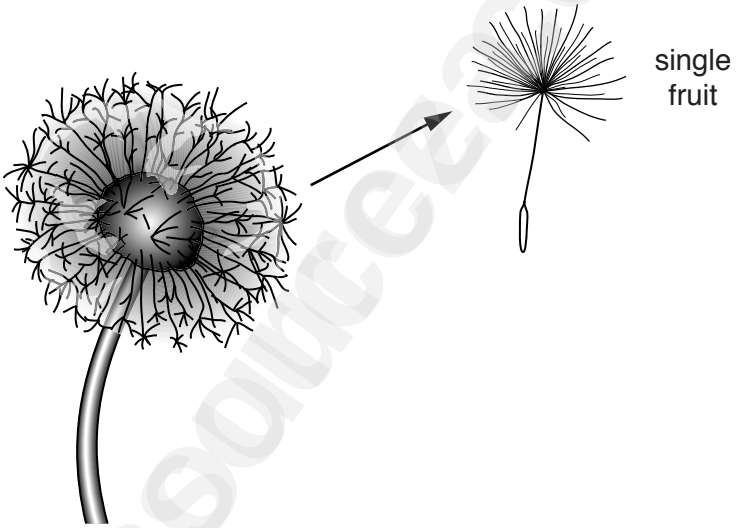

Fig. 6.1

Use Fig. 6.1 to suggest how the single dandelion fruits are dispersed from the parent plant.

Give a reason for your answer.

how fruits are dispersed .....

.....

reason .....

.....

.....
[2]

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(d) Seeds will only germinate if they are provided with suitable conditions.

State the environmental conditions that are required for all seeds to germinate.

.....

.....

.....[3]

[Total: 7]

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7 **(a)** Fig. 7.1 shows four organisms in a food chain, the part each organism plays in the food chain and a description of how it feeds. These are **not** in the correct order.

Draw **one** straight line from each organism to the part it plays in the food chain.

Draw **one** straight line from each part played in the food chain to its description.

organism	part it plays in food chain	description of feeding method
	carnivore	makes organic nutrients using energy from sunlight
	decomposer	gets its energy by eating plants
	herbivore	gets its energy by eating other animals
	producer	gets its energy from dead or waste matter

Fig. 7.1 [6]

(b) Define the term *trophic level.*

.....

.....

.....[1]

[Total: 7]

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8 Fig. 8.1 shows how the human population changed between the year 1500 and the year 2000.

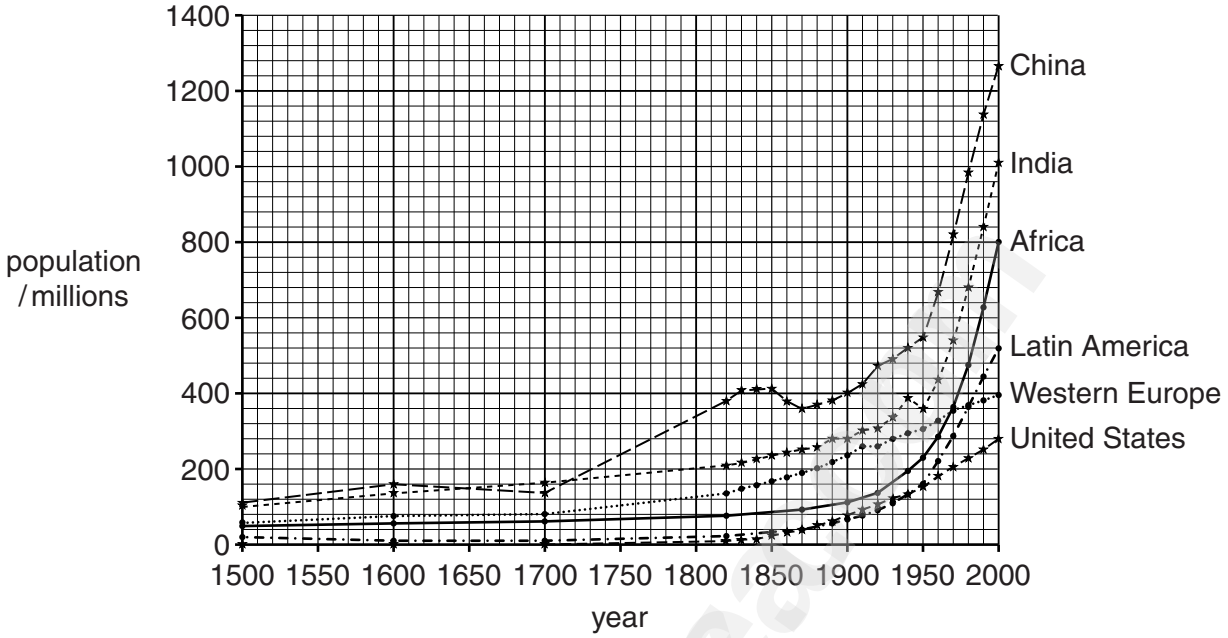

Fig. 8.1

(a) **(i)** Define the term *population*.

.....

.....

.....

.....[2]

(ii) Use the graphs in Fig. 8.1 to estimate the **total** world population in the year 2000. Choose from the list.

less than 2300 million **3300 million** **4300 million** **more than 4800 million**

estimated world population = ...[1]

(b) The populations of Africa and Latin America show a similar pattern of growth over the 500 year period.

Describe and suggest reasons for this pattern of growth.

description of pattern .....

.....

explanation .....

.....

.....

.....[3]

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(c) The populations of India and China also show a similar pattern to each other. Both populations have decreased at one point in time and then increased.

State **two** factors that could cause a human population to **decrease**.

1 .....

.....

2 .....

.....
[2]

(d) In 1970, scientists started counting different groups of birds living on a large island.

Fig. 8.2 shows how the numbers of four of these bird groups changed between 1970 and 2010.

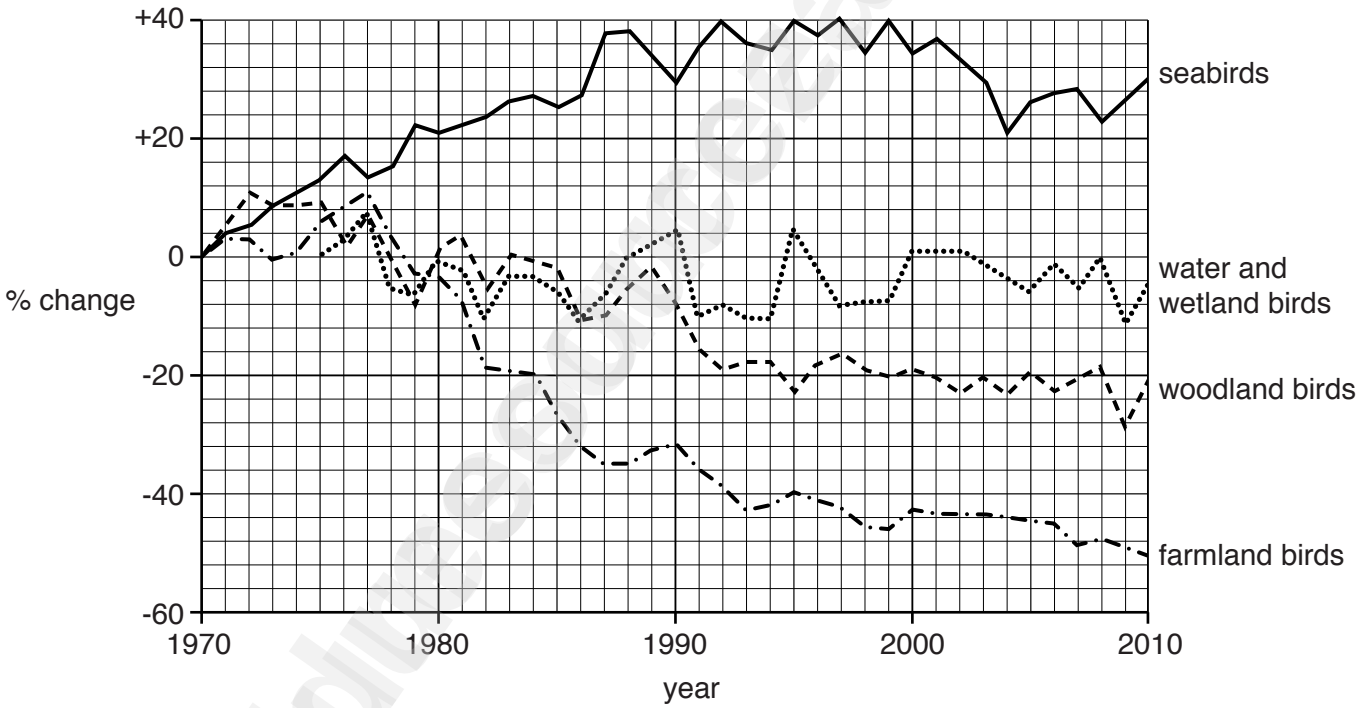

Fig. 8.2

(i) Compare the results for seabirds with the results for woodland birds.

.....

.....

.....

.....

.....[2]

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(ii) Suggest a reason for the change in the numbers of woodland birds since 1990.

.....[1]

(iii) The results for farmland birds are a particular cause for concern.

Describe why it is important to conserve species and their habitats.

.....

.....

.....

.....

.....[2]

[Total: 13]

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9 Brachydactyly (club thumbs) is an inherited condition affecting the shape of the thumbs.

Club thumbs are produced when a person inherits a dominant allele.

Fig. 9.1 shows a normal thumb and a club thumb.

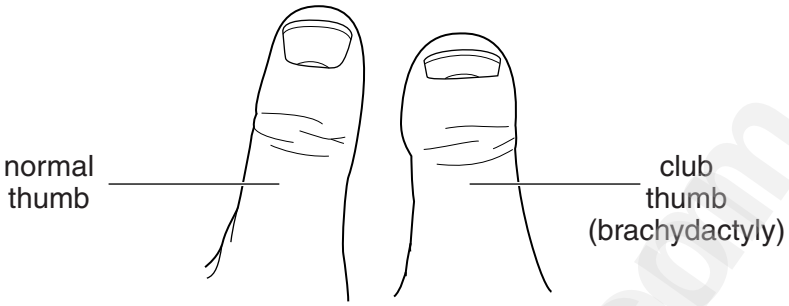

Fig. 9.1

(a) **(i)** Describe the meaning of the term *inherited*.

.....

.....[1]

(ii) Define the term *dominant allele*.

.....

.....

.....

.....

.....[2]

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(b) Fig. 9.2 shows part of a family tree. Some of the individuals in the family tree have club thumbs.

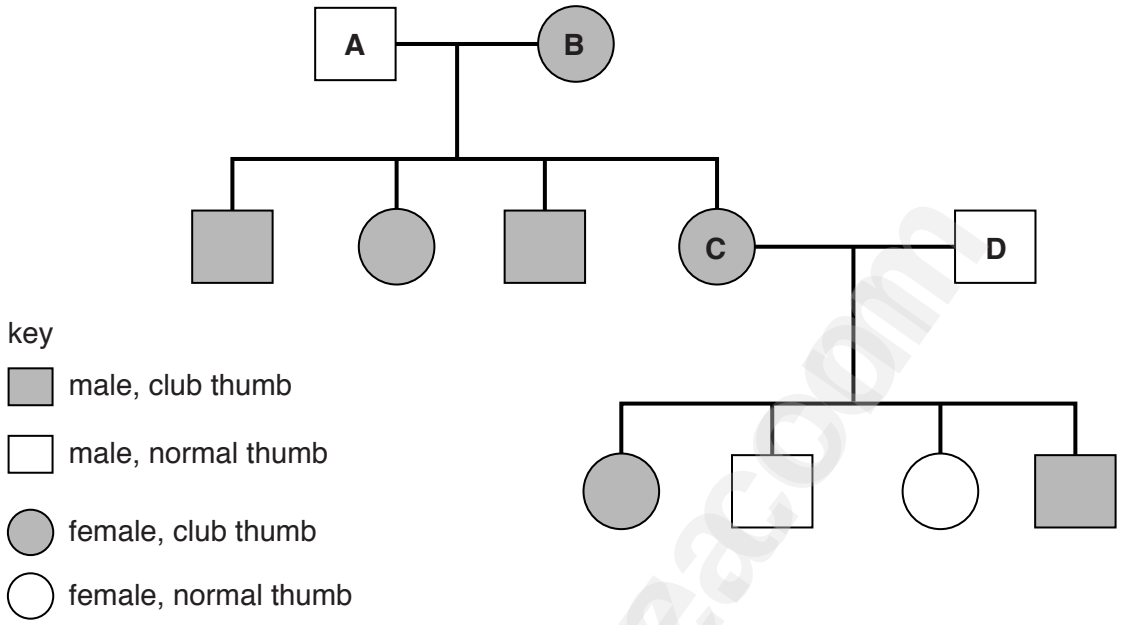

Fig. 9.2

(i) Person **C** and person **D** have four children.
Complete the genetic diagram to show why some of the children have club thumbs and why some have normal thumbs.

Use the letter **T** to represent the allele for club thumbs.
Use the letter **t** to represent the allele for normal thumbs.

	C		**D**	
parental phenotypes	.....	×	.....	
parental genotypes	Tt	×	.....	
gametes	.....	.....	.....	.....
genotypes of children	.....	.....	.....	.....
phenotypes of children	.....	.....	.....	.....

ratio.....[6]

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(ii) Person **B** is homozygous for the gene for club thumbs.

State the evidence in Fig. 9.2 which supports this statement.

.....

.....

.....[1]

[Total: 10]

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