Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

5518523036

BIOLOGY **0610/31**

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.

DC (NH/CGW) 133508/4
© UCLES 2017

1 Fig. 1.1 shows five different insects.

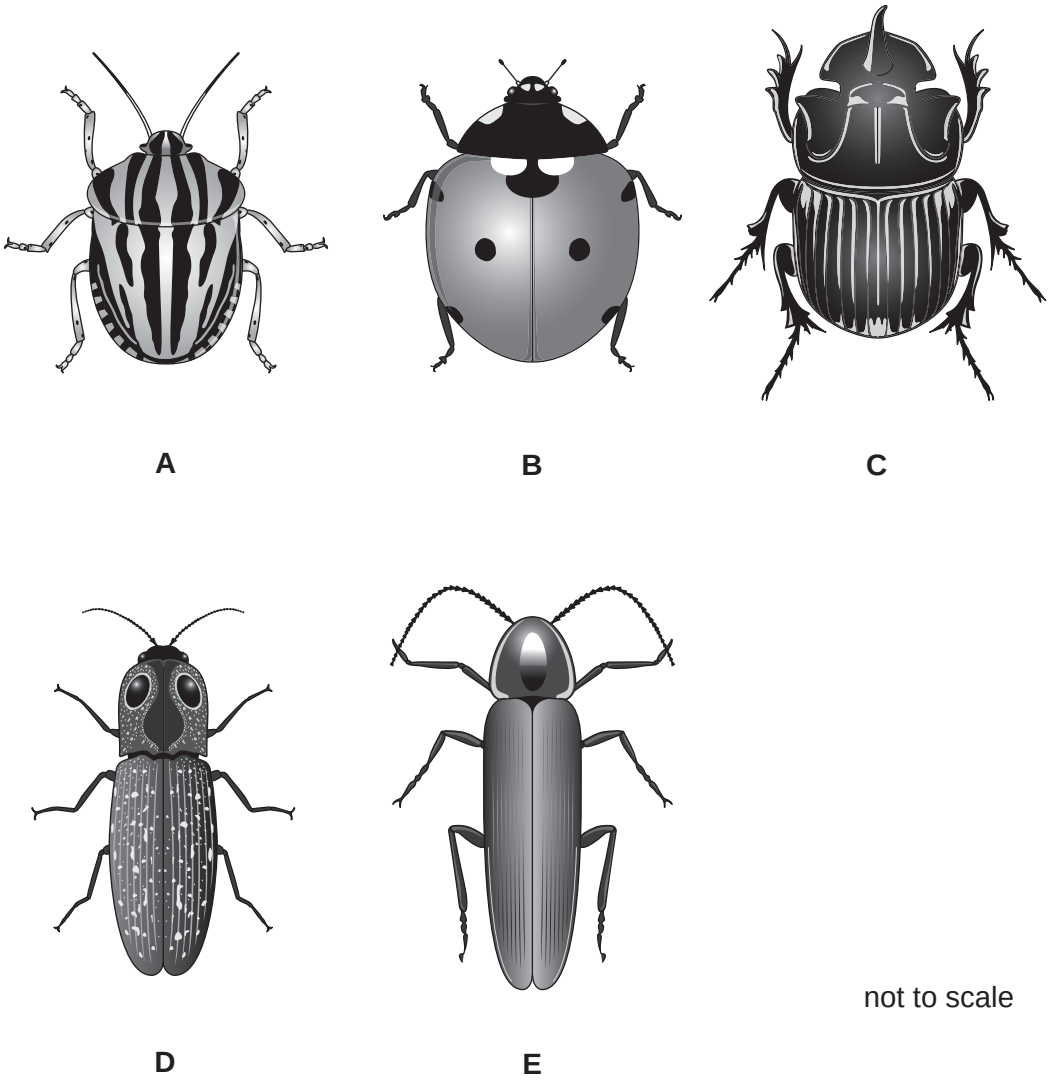


Fig. 1.1

Use the key to identify the insects in Fig. 1.1.

Write the letter for each insect in Table 1.1.

Table 1.1

	key	name of insect	letter
1 (a)	body is long and thin	go to 2	
(b)	body is short and rounded	go to 3	
2 (a)	body has a spotted pattern	*Alaus oculatus*	
(b)	body has a plain pattern	*Photinus pyralis*	
3 (a)	no visible antennae	*Copris lunaris*	
(b)	visible antennae	go to 4	
4 (a)	body has a striped pattern	*Graphosoma lineatum*	
(b)	body has a dotted pattern	*Coccinella septempunctata*	

[4]

[Total: 4]

© UCLES 2017

[Turn over

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

.....

.....

.....[2]

(b) Fig. 2.1 shows a marine food web.

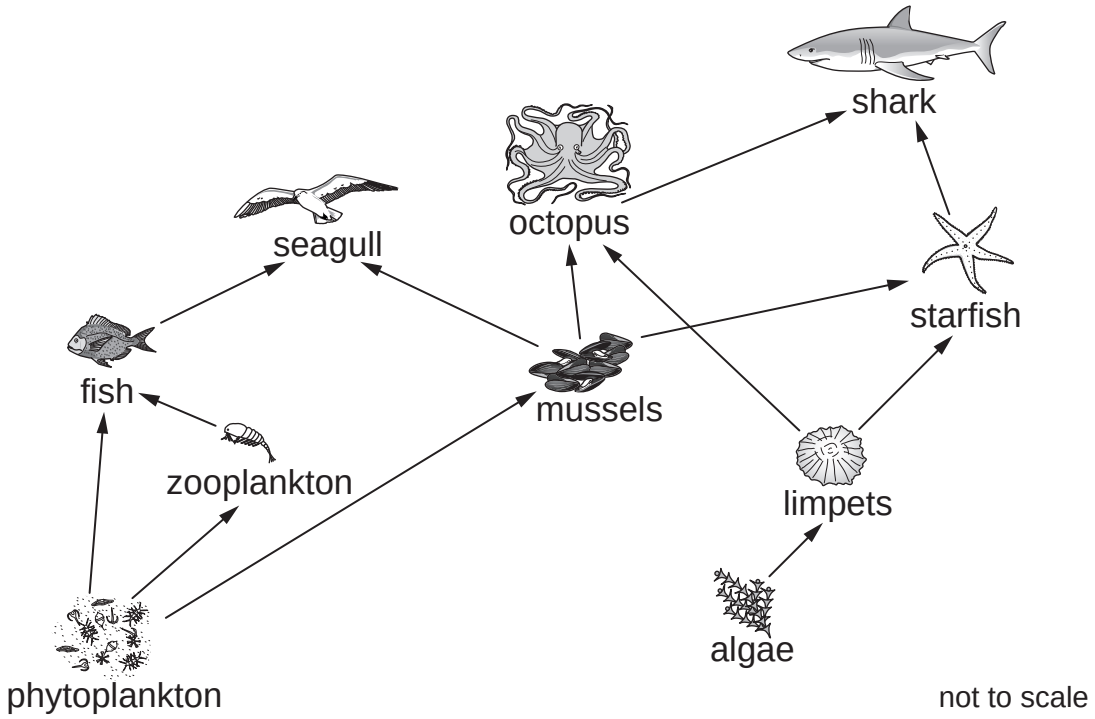


Fig. 2.1

Use Fig. 2.1 to answer these questions.

(i) State the name of **one** producer in this food web.

.....[1]

(ii) State the name of **one** herbivore in this food web.

.....[1]

(iii) Complete the food chain, containing four organisms, that ends with the seagull.

Write the names of the organisms in the boxes.



[1]

(iv) The shark population has decreased.

Explain what effect this might have on the populations of starfish and limpets.

starfish .....

.....

.....

limpets .....

.....

.....

[4]

(v) Suggest **two** factors that could decrease the shark population.

1 .....

2 .....

[2]

(c) State the principal source of energy for food webs.

.....[1]

(d) The sea forms an important part of the water cycle.

Fig. 2.2 shows the water cycle.

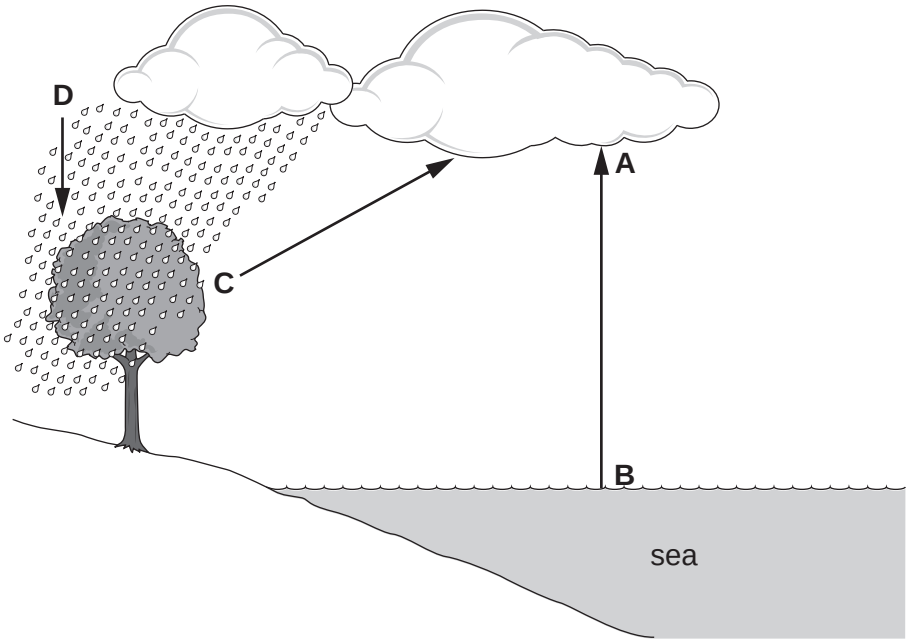


Fig. 2.2

State the names of the processes shown by the letters in Fig. 2.2.

A .....

B .....

C .....

D .....

[4]

[Total: 16]

3 **(a)** There are four different types of birth control method. These are shown in Table 3.1.

Complete Table 3.1 by writing each of the following examples of birth control in the correct column.

abstinence **condom** **contraceptive pill**

diaphragm **female sterilisation** **IUD**

monitoring body temperature **vasectomy**

Table 3.1

type of birth control method			
natural	chemical	barrier	surgical

[4]

(b) Complete the sentences to state how the contraceptive pill works.

Choose your answers from the list.

Each of the words may be used once, more than once or not at all.

egg cells **enzymes** **hormones** **ovary**

ovules **sperm** **testes**

The contraceptive pill contains ..... . They work by preventing the

..... releasing ..... .

[3]

© UCLES 2017

[Turn over

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

(i) State what the letters HIV stand for.

.....[1]

(ii) Describe **two** ways that HIV can be transmitted.

1 .....

2 .....
[2]

(iii) Suggest **two** ways that the spread of HIV can be controlled.

1 .....

.....

2 .....

.....
[2]

[Total: 12]

© UCLES 2017

4 Fig. 4.1 shows a lily flower.



Fig. 4.1

(a) State the letters that identify the parts of the flower in Fig. 4.1.

anther .....

filament .....

petal .....

stigma .....

[4]

(b) The lily flower is pollinated by insects.

State **two** ways that the pollen from the lily flower is different from the pollen of a wind-pollinated flower.

1 .....

2 .....

[2]

(c) Pollen contains the male gamete.

State the name of the process that produces gametes.

.....[1]

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

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

Draw one straight line to link each part of the flower with its function.

Draw **four** lines.

part of a flower	**function**
	where ovules are produced
ovary	
	where pollen is produced
petal	
	protects the flower when in bud
sepal	
	often coloured to attract insects
stigma	
	where pollen is deposited

[4]

[Total: 11]

© UCLES 2017

5 Fig. 5.1 shows a diagram of a cross-section of a leaf.

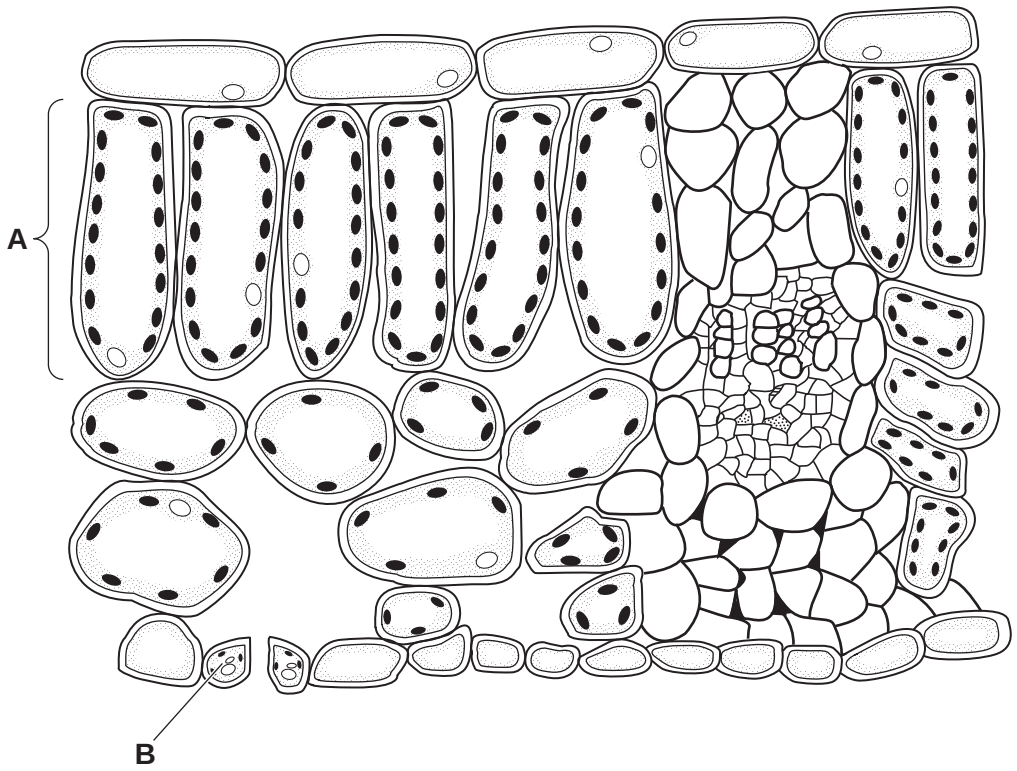


Fig. 5.1

(a) (i) Identify the parts labelled on Fig. 5.1 and state the names of

tissue **A** .....

cell **B** .....

[2]

(ii) The cells in tissue **A** are adapted for photosynthesis.

State where photosynthesis occurs in the cell.

.....[1]

(b) Draw circles around the structures that are found in both plant **and** animal cells.

cell membrane	**cell wall**	**cytoplasm**
starch grains	**nucleus**	**permanent vacuole**

[3]

© UCLES 2017

(c) State the raw materials needed for photosynthesis.

.....[1]

(d) Fig. 5.2 shows two leaves from the same plant.

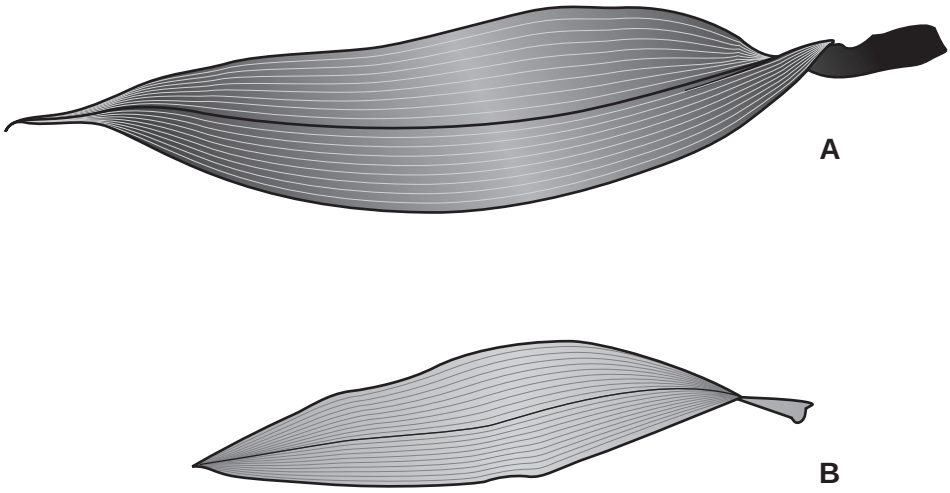


Fig. 5.2

Suggest which leaf carries out more photosynthesis **and** explain why.

.....

.....

.....

.....

.....[2]

[Total: 9]

6 Drugs are substances that alter chemical reactions in the body.

(a) The boxes in the middle show the name of the drug.

The boxes on the left show the long-term risk of using the drug.

The boxes on the right show the short-term effect of using the drug.

Draw one straight line from the name of the drug to its long-term risk.

Draw another line from the name of the drug to its short-term effect.

Draw three lines on each side.

long-term risk	drug	short-term effect
lung cancer	alcohol	
		depressant
infections such as HIV	tobacco	
		reduces oxygen capacity of the blood
liver damage	heroin	

[3]

(b) Fig. 6.1 shows the percentage of people who misused drugs in a one-month period.

These data were taken from a survey of people of different ages.

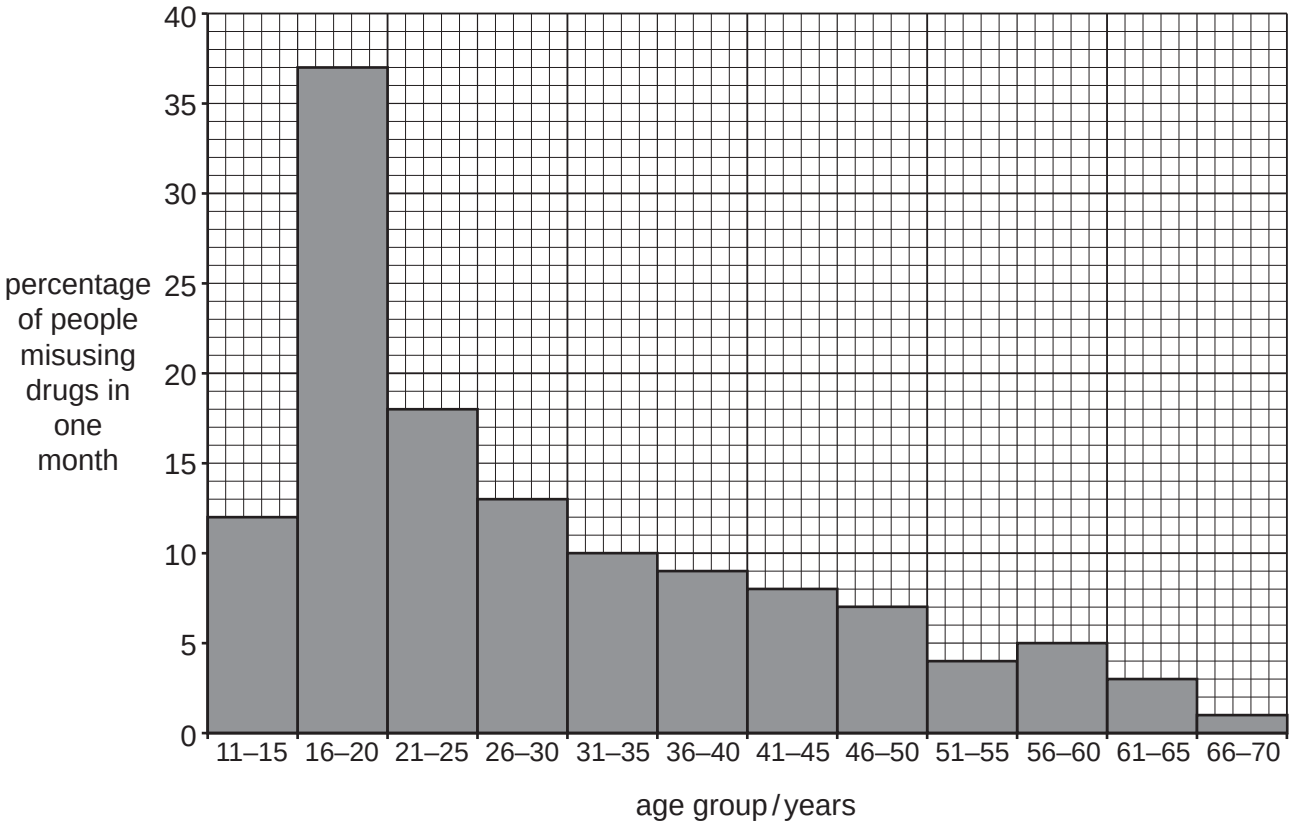


Fig. 6.1

Use the information in Fig. 6.1 to answer these questions.

(i) State the age group that had the lowest percentage of people misusing drugs.

.....years [1]

(ii) State the percentage of 31–35 year-olds that misused drugs in one month.

.....% [1]

(iii) Describe the results shown in Fig. 6.1.

.....

.....

.....

.....

.....[3]

© UCLES 2017

(c) Drugs can also be used for medicinal reasons. Antibiotics are an example of a medicinal drug.

State what type of infection a doctor might prescribe antibiotics for.

.....

.....[1]

[Total: 9]

7 Fig. 7.1 shows a potometer.

This equipment is used to measure the rate of water uptake in a leafy shoot.

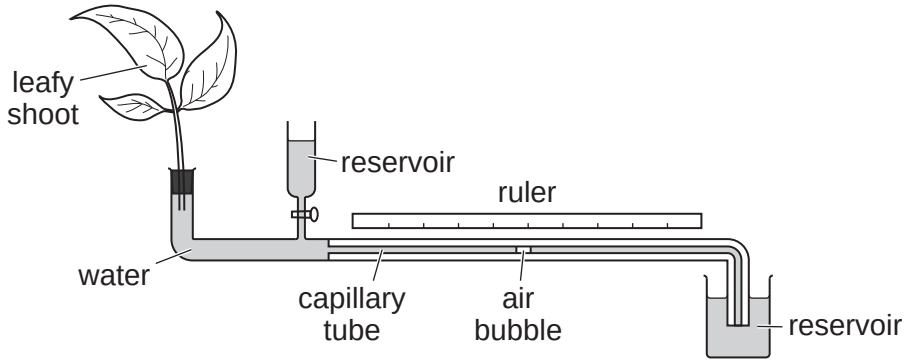


Fig. 7.1

(a) A leafy shoot in a potometer was exposed to different conditions.

The distance moved by the air bubble in 10 minutes was recorded.

Table 7.1 shows the results.

Table 7.1

conditions	distance moved in 10 minutes / mm
cool, damp air	4
cool, dry air	6
warm, damp air	10
warm, dry air	50

(i) State which conditions result in the greatest rate of water uptake in the shoot.

.....[1]

(ii) Calculate the rate of water uptake in millimetres per minute for the shoot in **cool**, **damp air**.

Show your working.

..... mm per min
[2]

(iii) The rate of water uptake is approximately equal to the rate of transpiration.

An increase in wind speed increases the rate of transpiration.

Suggest the effect that increasing wind speed would have on the movement of the air bubble.

.....

.....[1]

(b) State where **and** how water normally enters a plant.

.....

.....

.....[2]

(c) Describe how water is lost from a plant by transpiration.

.....

.....

.....

.....

.....

.....

.....[3]

(d) State the name of the tissue that transports water to the leaves.

.....[1]

[Total: 10]

© UCLES 2017

[Turn over

8 Water is an important part of a balanced diet.

(a) State **three** other components of a balanced diet.

1 .....

2 .....

3 .....

[3]

(b) State where **most** water is absorbed in the alimentary canal.

.....[1]

(c) Excess water is removed in the urine.

Fig. 8.1 shows the organ system that excretes excess water.

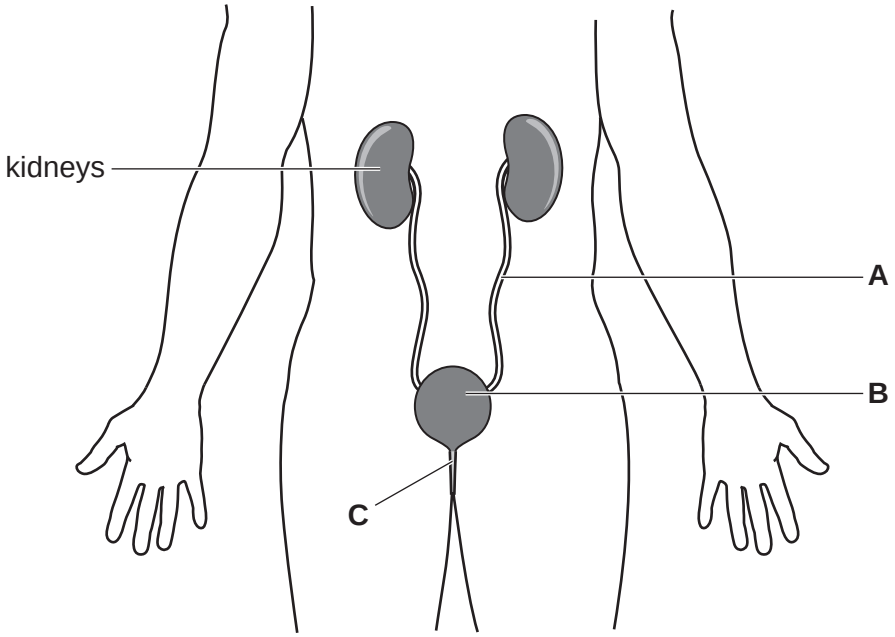


Fig. 8.1

State the names of the parts labelled **A**, **B** and **C**.

A .....

B .....

C .....

[3]

© UCLES 2017

(d) The volume and the concentration of urine can vary.

Body temperature, exercise and water intake affect the volume and concentration of urine.

Table 8.1 shows three changes in the body.

Complete Table 8.1 by putting a tick in the boxes to show how each change affects the volume and concentration of the urine.

One example has been done for you.

Table 8.1

changes in the body	urine volume		urine concentration	
	increases	decreases	increases	decreases
increase in body temperature		✓	✓	
increase in exercise				
increase in water uptake				

[2]

[Total: 9]

BLANK PAGE

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge International Examinations Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cie.org.uk after the live examination series.

Cambridge International Examinations is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.