Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

BIOLOGY **0610/23**

Paper 2 Multiple Choice (Extended) **May/June 2017**

45 minutes

Additional Materials: Multiple Choice Answer Sheet
Soft clean eraser
Soft pencil (type B or HB is recommended)

* 3 2 9 1 2 2 9 6 6 6 *

READ THESE INSTRUCTIONS FIRST

Write in soft pencil.
Do not use staples, paper clips, glue or correction fluid.
Write your name, Centre number and candidate number on the Answer Sheet in the spaces provided unless this has been done for you.
DO **NOT** WRITE IN ANY BARCODES.

There are **forty** questions on this paper. Answer **all** questions. For each question there are four possible answers **A**, **B**, **C** and **D**.
Choose the **one** you consider correct and record your choice in **soft pencil** on the separate Answer Sheet.

Read the instructions on the Answer Sheet very carefully.

Each correct answer will score one mark. A mark will not be deducted for a wrong answer.
Any rough working should be done in this booklet.
Electronic calculators may be used.

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 **16** printed pages.

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1 Which characteristic do **all** living organisms show?

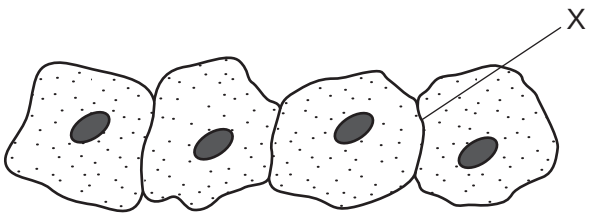
A breathing

B excretion

C photosynthesis

D tropism

2 The diagram shows some animal cells, as seen under the microscope.



What will be present at X?

A one cell membrane

B one cell wall

C two cell membranes

D two cell walls

3 Which structures are present in large numbers in cells with high rates of metabolism?

A chromosomes

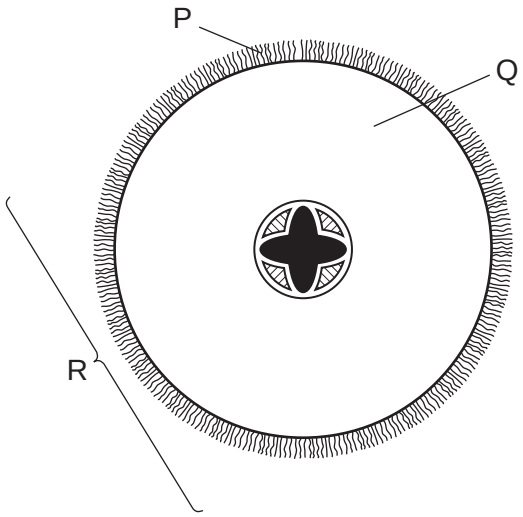
B mitochondria

C ribosomes

D vacuoles

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4 The diagram shows a section through a root.



What are the levels of organisation of the labelled structures?

	cell	organ	tissue
A	P	Q	R
B	P	R	Q
C	Q	R	P
D	R	Q	P

5 Which characteristics are correct for **both** osmosis and diffusion?

	require a partially permeable membrane	require a concentration gradient	are energy consuming processes
A	✓	✓	✗
B	✓	✗	✓
C	✗	✓	✗
D	✗	✗	✓

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[Turn over

6 The bases on one of the strands of a DNA molecule have the sequence shown.

A-A-T-C-T-G

What is the corresponding sequence of bases on the other strand?

A A-A-T-C-T-G

B C-C-G-A-G-T

C G-G-C-T-C-A

D T-T-A-G-A-C

7 Which statement describes the effect of temperature on enzymes?

A High temperatures denature enzymes making it difficult for substrate molecules to fit into the active site.

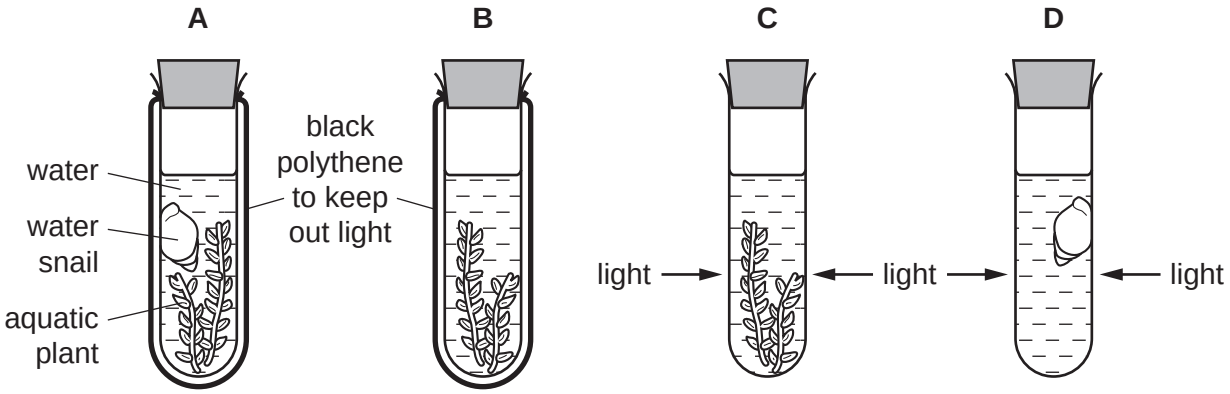
B High temperatures denature enzymes making it easy for substrate molecules to fit into the active site.

C Low temperatures denature enzymes making it difficult for substrate molecules to fit into the active site.

D Low temperatures denature enzymes making it easy for substrate molecules to fit into the active site.

8 Four test-tubes are set up as shown.

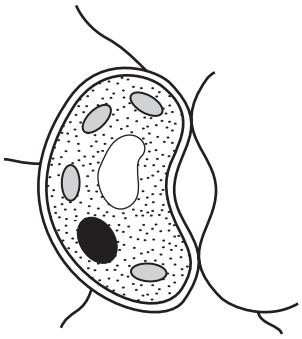
Which test-tube contains the most carbon dioxide after one hour?



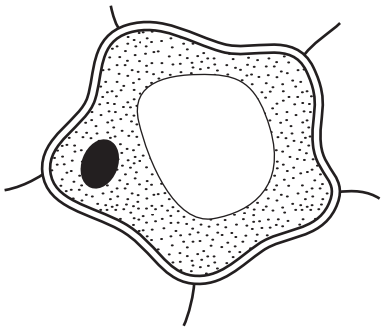
9 The diagrams show the structure of four different cells from the leaf of a dicotyledonous plant.

Which cell is a guard cell?

A

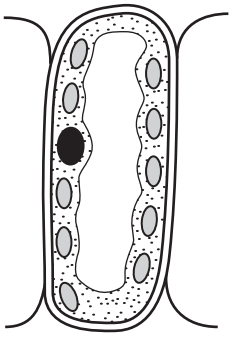


B

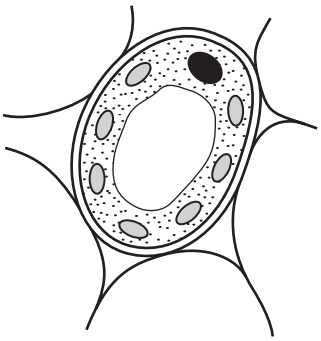


NOT TO SCALE

C



D



10 Which mineral ion is absorbed by plant roots and used in the production of all amino acids?

A carbonate

B hydroxide

C magnesium

D nitrate

11 Which is the equation for photosynthesis?

A $C_6H_{12}O_6 \rightarrow 2C_2H_5OH + 2CO_2$

B $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + H_2O$

C $2C_2H_5OH + 2CO_2 \rightarrow C_6H_{12}O_6$

D $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$

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12 Statements 1–4 describe stages in the development of cholera.

1 Chloride ions are secreted in the gut.

2 Osmosis causes water to move into the gut.

3 The infected person becomes dehydrated.

4 Toxins are produced by the pathogenic bacteria.

What is the correct sequence of the four stages?

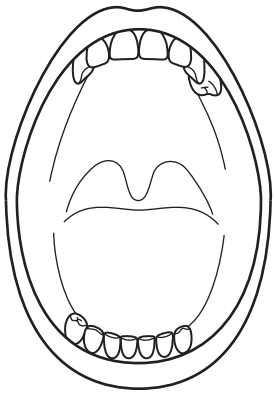
A $1 \rightarrow 2 \rightarrow 3 \rightarrow 4$

B $1 \rightarrow 4 \rightarrow 3 \rightarrow 2$

C $4 \rightarrow 1 \rightarrow 2 \rightarrow 3$

D $4 \rightarrow 1 \rightarrow 3 \rightarrow 2$

13 The diagram shows a person's teeth. Some of their teeth are missing.



What would the person find difficult?

A biting apples

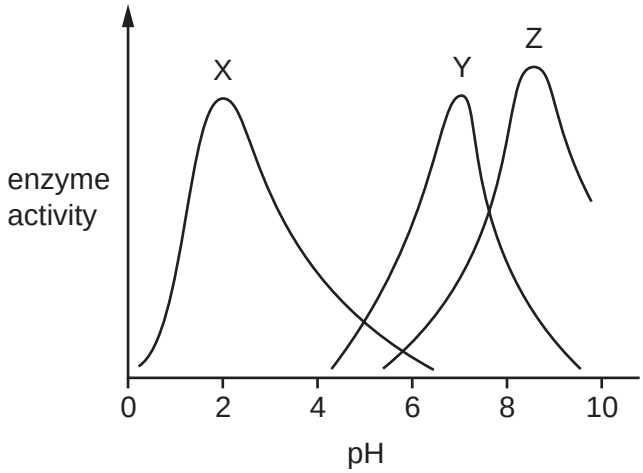
B drinking water

C grinding meat

D tearing dry bread

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14 The graph shows the effect of pH on the activity of three different enzymes.



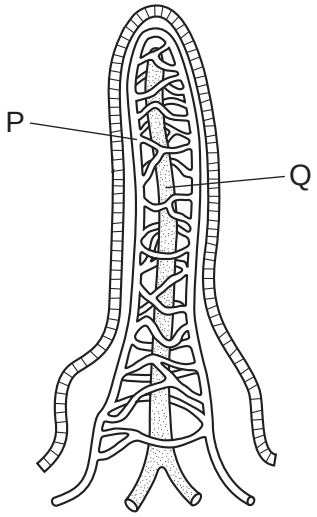
The table shows the pH of different parts of the alimentary canal.

part of the alimentary canal	pH
mouth	7.0
stomach	2.0
small intestine	8.5

Which enzymes in the graph are likely to be protease enzymes?

A X, Y and Z **B** X and Z only **C** Y and Z only **D** Z only

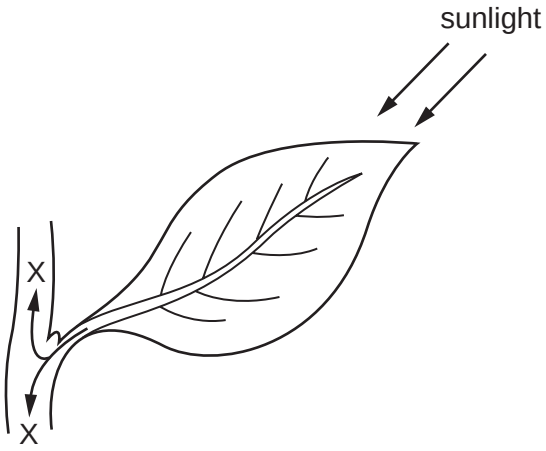
15 The diagram shows a villus. Structures P and Q absorb different products of digestion.



Which row identifies the products absorbed by P and Q?

	P	Q
A	amino acids	glucose
B	fatty acids	maltose
C	glucose	fatty acids
D	maltose	amino acids

16 The diagram shows a leaf attached to the stem of a plant.



What do the arrows at X represent?

A movement of amino acids in phloem

B movement of carbon dioxide in phloem

C movement of mineral ions in xylem

D movement of sucrose in xylem

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17 Which row shows what is carried, and in which direction, by the pulmonary vein?

	what is carried	direction
A	deoxygenated blood	from the heart
B	deoxygenated blood	to the heart
C	oxygenated blood	from the heart
D	oxygenated blood	to the heart

18 Which component of the blood produces antibodies?

A lymphocytes

B phagocytes

C plasma

D red blood cells

19 Which statement about antibodies is correct?

A Breast milk contains antibodies and protects babies by giving them active immunity.

B Injections of antibodies give passive immunity against the disease scurvy.

C Insect repellents contain antibodies and give mosquitoes passive immunity against malaria.

D Injections of antibodies give passive immunity against some pathogens.

20 Which row shows the correct combination of muscle contractions and the pressure in the thorax when breathing out?

	internal intercostal muscles	external intercostal muscles	diaphragm	pressure in thorax
A	contracted	contracted	contracted	high
B	contracted	relaxed	relaxed	high
C	relaxed	contracted	contracted	high
D	relaxed	relaxed	relaxed	low

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[Turn over

21 Which is **not** involved in removing the oxygen debt after a human has been exercising?

A aerobic respiration of alcohol in the liver

B aerobic respiration of lactic acid in the liver

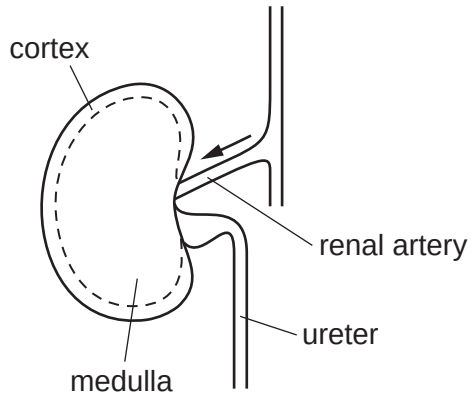
C continuation of deeper breathing

D continuation of faster heart rate

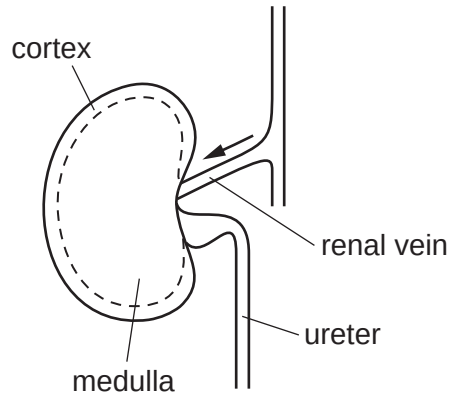
22 A longitudinal section of the kidney and some associated structures have been labelled.

Which labelling is correct?

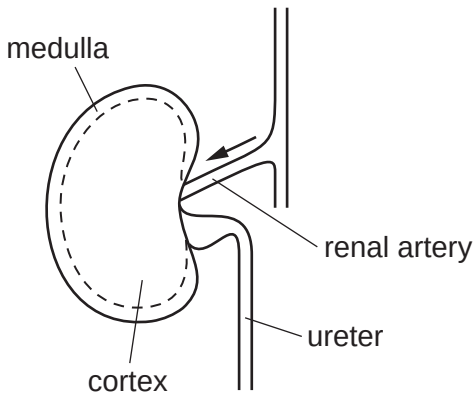
A



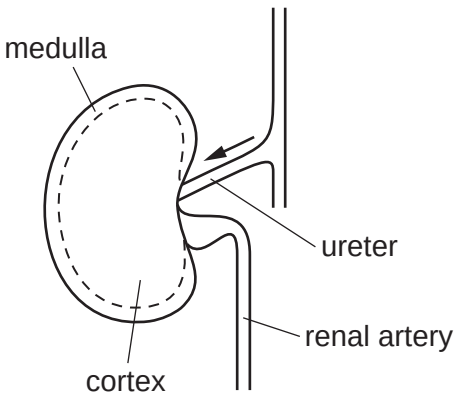
B



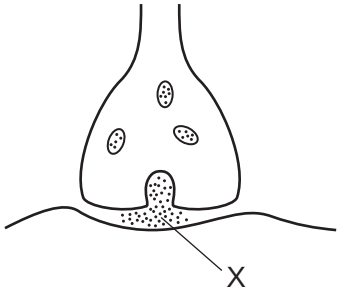
C



D



23 The diagram shows a synapse.



What do the dots at X represent?

A neurotransmitter

B receptor molecule

C synaptic cleft

D vesicle

24 Which is the light sensitive part of the eye?

A cornea

B iris

C lens

D retina

25 What is meant by the term *phototropism*?

A absorbing mineral ions using light energy

B directional growth in response to gravity

C directional growth in response to light

D making food using light energy

26 Which row shows the effects of excessive alcohol consumption?

	reaction time	self-control	anti-social behaviour
A	quicker	increased	increased
B	quicker	reduced	increased
C	slower	increased	decreased
D	slower	reduced	increased

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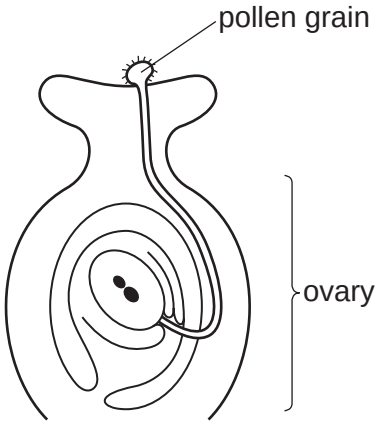
27 Dianthus flowers can be one of three different colours: red, pink or white.

A red flower is always homozygous and a white flower is always homozygous. Pink flowers are heterozygous.

If a red and a white flower are crossed, what percentage of the offspring will be pink?

A 0% **B** 25% **C** 75% **D** 100%

28 The diagram shows the ovary of a flower.



Which process is shown in the diagram?

A cross-pollination

B fertilisation

C meiosis

D self-pollination

29 What is a function of the placenta?

A a barrier to nicotine

B a barrier to the rubella virus

C exchange of blood

D transfer of dissolved nutrients

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30 Some men do not produce healthy sperm cells. A couple may choose to use the sperm of another man, a donor, in order for the woman to get pregnant.

Which procedure involves inserting sperm into the vagina of a woman from a donor?

A artificial insemination (AI)

B birth control

C *in vitro* fertilisation (IVF)

D vasectomy

31 Which blood component is destroyed in people who are HIV positive?

A lymphocytes

B phagocytes

C platelets

D red blood cells

32 Four of the processes involved in the production of a protein are shown.

1 mRNA attaches to a ribosome.

2 mRNA moves to the cytoplasm.

3 The ribosome assembles amino acids into a protein molecule.

4 An mRNA copy of the gene is made.

In which sequence do these events normally occur?

A $1 \rightarrow 2 \rightarrow 3 \rightarrow 4$

B $2 \rightarrow 1 \rightarrow 3 \rightarrow 4$

C $4 \rightarrow 2 \rightarrow 1 \rightarrow 3$

D $4 \rightarrow 3 \rightarrow 2 \rightarrow 1$

33 Which statement about the sex chromosomes is correct?

A Men and women can inherit characteristics from genes carried on the X chromosome.

B Men and women can inherit characteristics from genes carried on the Y chromosome.

C Only men can inherit characteristics from genes carried on the X chromosome.

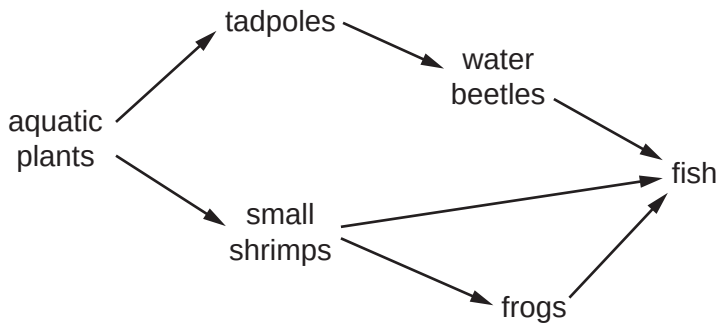
D Only women can inherit characteristics from genes carried on the Y chromosome.

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34 Which row best describes human blood groups?

	affected by environment	has no intermediate phenotypes	shows continuous variation	shows discontinuous variation
A	✓	✗	✓	✗
B	✓	✗	✗	✓
C	✗	✓	✓	✗
D	✗	✓	✗	✓

35 The diagram represents part of an aquatic food web.



Which organisms are primary consumers in this food web?

A small shrimps and tadpoles

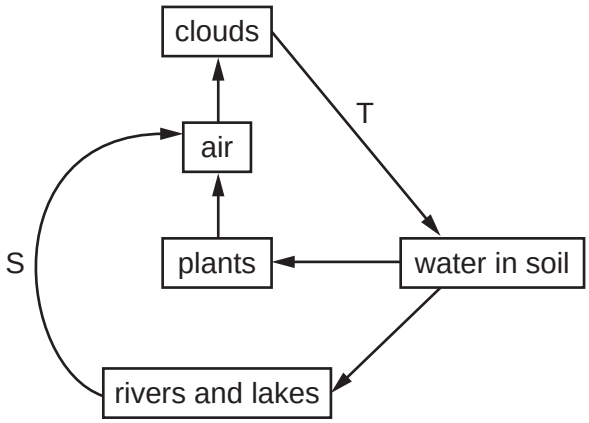
B tadpoles and frogs

C water beetles and fish

D water beetles and frogs

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36 The diagram shows part of the water cycle.

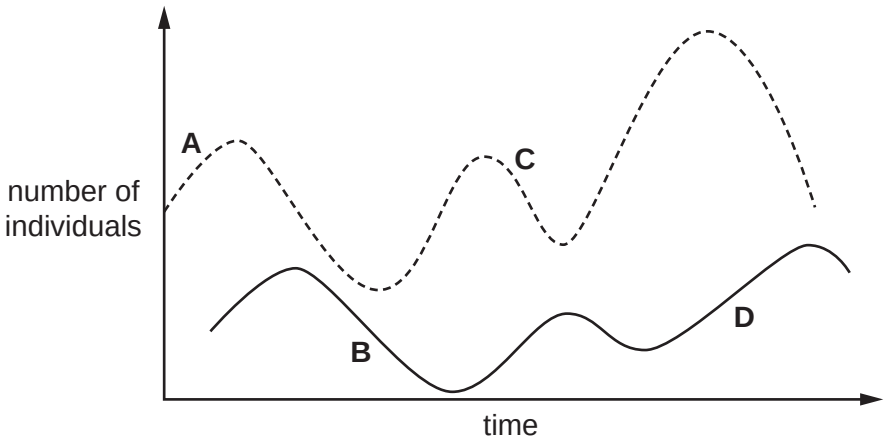


What are processes S and T?

	S	T
A	condensation	drainage
B	condensation	evaporation
C	evaporation	precipitation
D	evaporation	transpiration

37 The graph shows the changes in the populations of predator and prey over a period of time.

Which point on the graph shows a decrease in predator population?



38 Which is an example of genetic engineering?

A altering the DNA in crop plants so they are resistant to herbicides

B only breeding from crop plants that are resistant to insect pests

C production of insulin in the pancreas

D using yeast to produce ethanol for biofuels

39 Why is yeast used in breadmaking?

A to produce alcohol

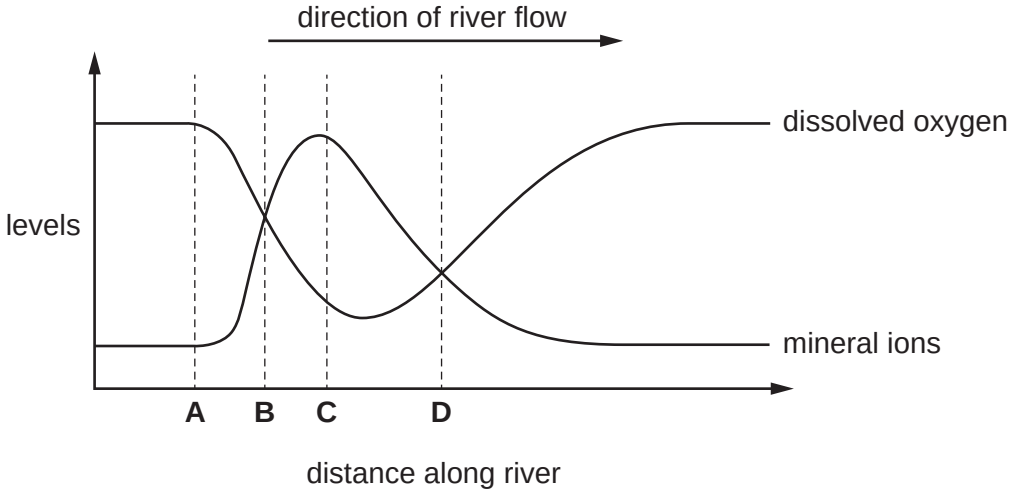
B to produce carbon dioxide

C to use up oxygen

D to use up sugar

40 The graph shows the levels of dissolved oxygen and mineral ions in a river.

At which point does raw sewage enter the river?



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