Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

BIOLOGY **0610/22**

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)

0369736826

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

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

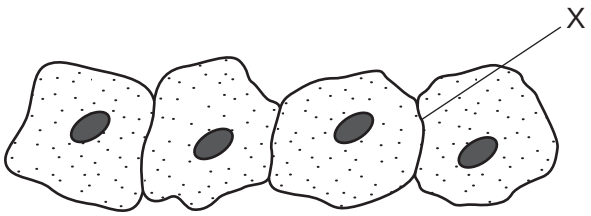
A breathing

B excretion

C photosynthesis

D tropism

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



What will be present at X?

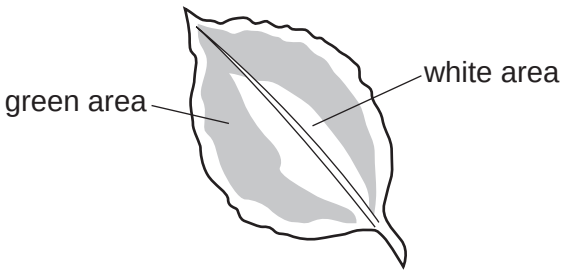
A one cell membrane

B one cell wall

C two cell membranes

D two cell walls

3 A plant has leaves that have white areas and green areas.



Which cell structures are **not** present in the white areas?

A cell membranes

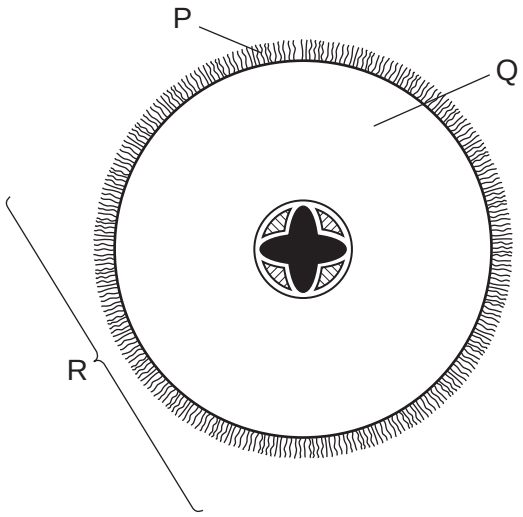
B cell walls

C chloroplasts

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	✗	✗	✓

6 Which is an example of active transport?

A carbon dioxide entering a leaf

B ion uptake by root hair cells

C oxygen moving from the alveoli into the blood

D water uptake by root hair cells

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7 An experiment was carried out to study the effect of temperature on the time taken for protein to be digested by an enzyme.

The table shows the results.

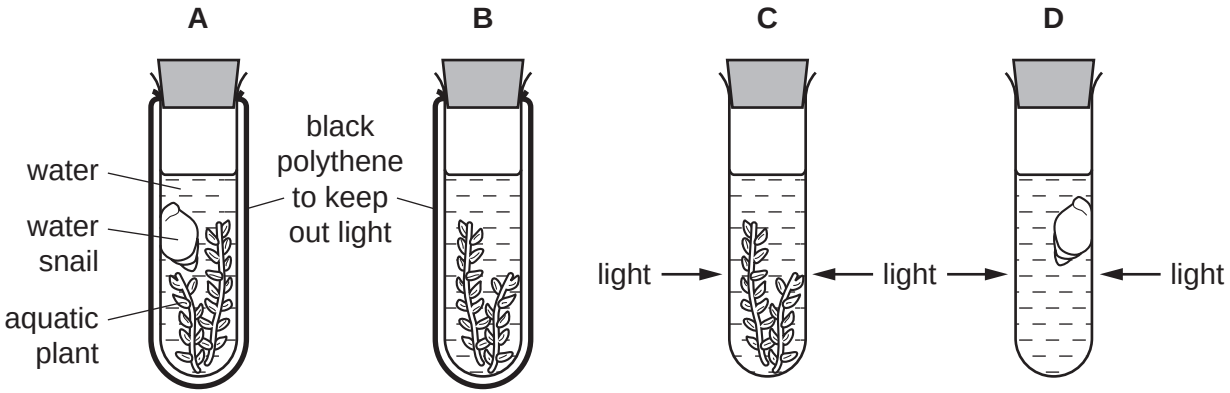
temperature / ℃	observation
25	4 hours for complete digestion
35	2 hours for complete digestion
45	3 hours for complete digestion
55	no digestion takes place

For these results, at which temperature does the enzyme denature?

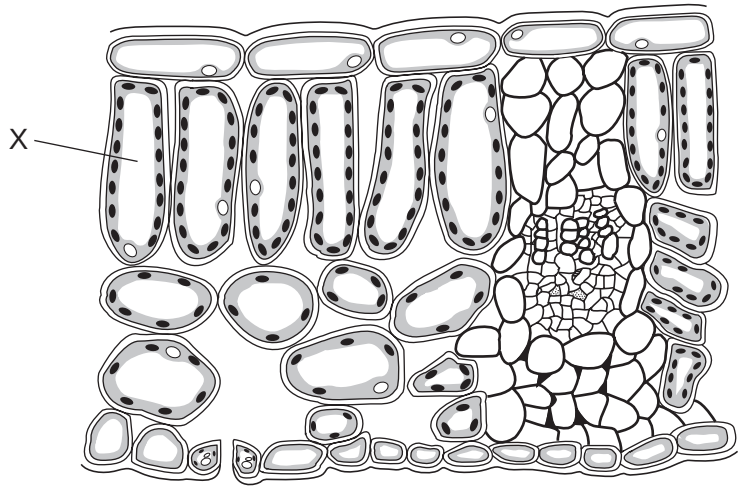
A 20 ℃ **B** 30 ℃ **C** 40 ℃ **D** 50 ℃

8 Four test-tubes are set up as shown.

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



9 The diagram shows a cross-section through a leaf.



What is the cell labelled X?

A epidermis

B guard cell

C palisade mesophyll

D spongy mesophyll

10 The nutrient ions present in four different soils are shown.

Which soil would be best for growing healthy, green plants?

	nitrate ions	magnesium ions
A	absent	absent
B	absent	present
C	present	absent
D	present	present

11 Which disease is caused by a deficiency of iron in the diet?

A anaemia

B kwashiorkor

C marasmus

D rickets

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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?

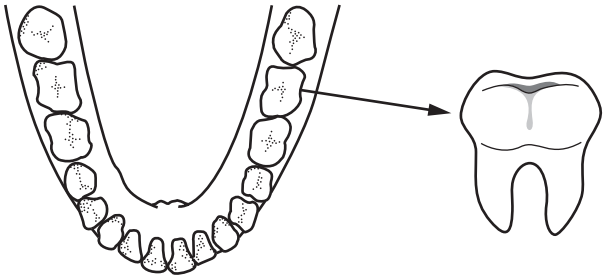
A $1 \rightarrow 2 \rightarrow 3 \rightarrow 4$

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 Which type of tooth does the diagram show?



A canine

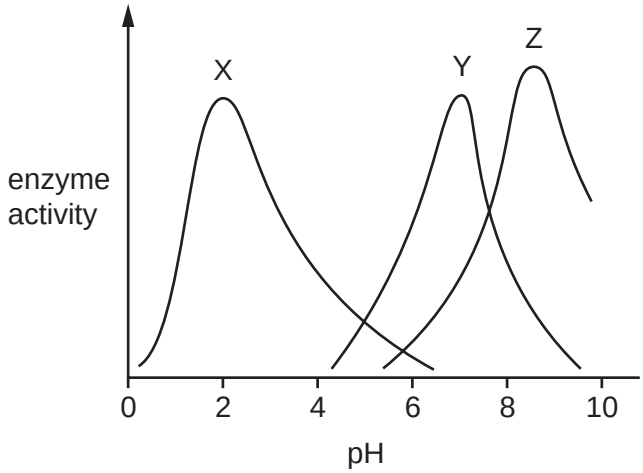
B incisor

C molar

D premolar

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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 Which statement describes assimilation?

A the breakdown of large, insoluble molecules into small soluble molecules

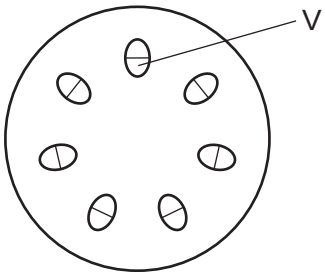
B the movement of small soluble molecules through the wall of the intestine into the blood

C the movement of small soluble molecules into the cells of the body, where they are used, becoming part of the cells

D the taking of substances into the body through the mouth

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16 The diagram shows a cross-section of a plant stem.



What is the function of the tissue labelled V?

A transporting dissolved nutrients and mineral ions

B transporting dissolved nutrients only

C transporting water and mineral ions

D transporting water only

17 Which process occurs during transpiration?

A evaporation of water from the xylem

B loss of water by osmosis from the guard cells

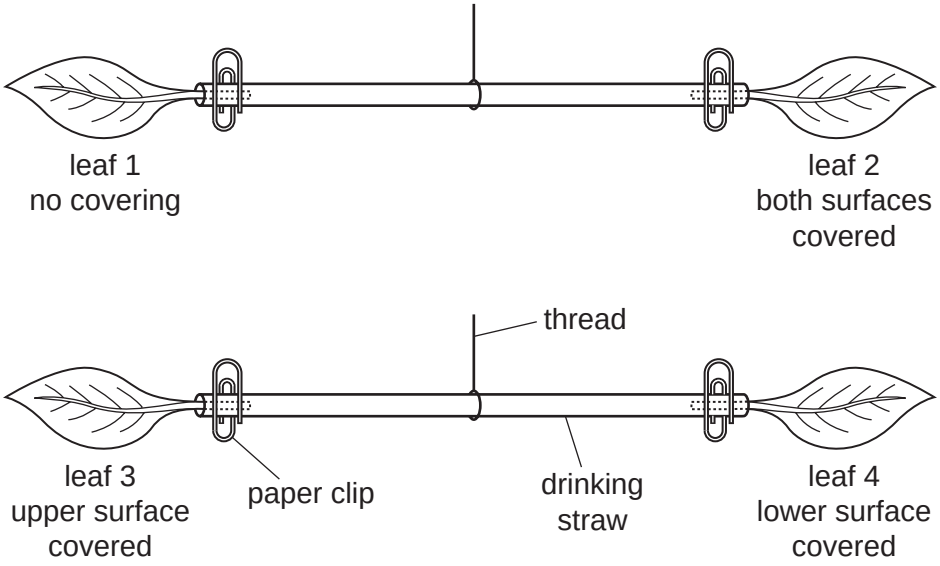
C movement of water vapour through the spongy mesophyll by active transport

D movement of water vapour through the stomata by diffusion

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18 The diagrams show an experiment on transpiration.

Four leaves of the same species are balanced on two drinking straws. One or both sides of the leaves are covered in grease. Any difference in mass causes the heavier end to be lower.



At the start of the experiment the straws were positioned so that the leaves were level.

Which leaves will be lower after an hour?

A 1 and 3 **B** 1 and 4 **C** 2 and 3 **D** 2 and 4

19 Which chamber of the heart has the most muscular wall?

A left atrium

B left ventricle

C right atrium

D right ventricle

20 A deficiency in which of the following may result in a person's blood failing to clot properly?

A antibodies

B fibrinogen

C haemoglobin

D protease

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21 Which is a function of some white blood cells?

A to carry glucose

B to carry oxygen

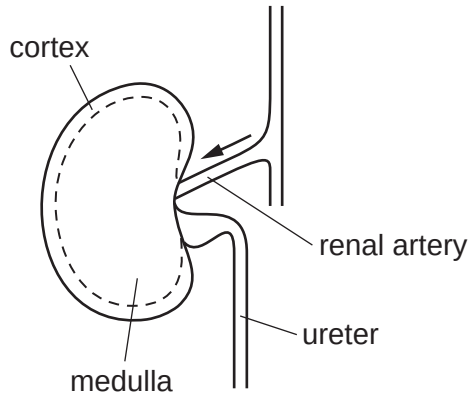
C to produce antibiotics

D to produce antibodies

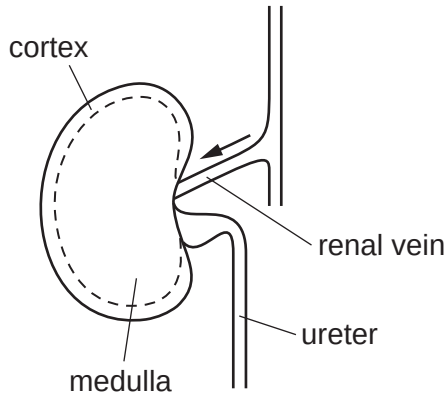
22 A longitudinal section of the kidney and some associated structures have been labelled.

Which labelling is correct?

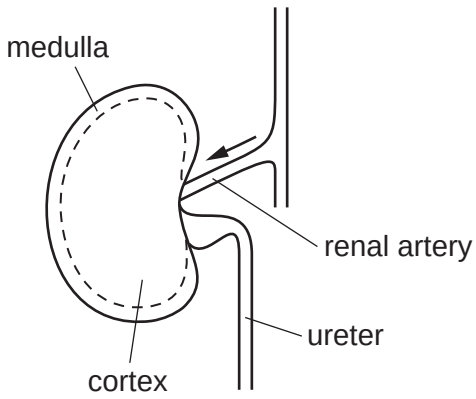
A



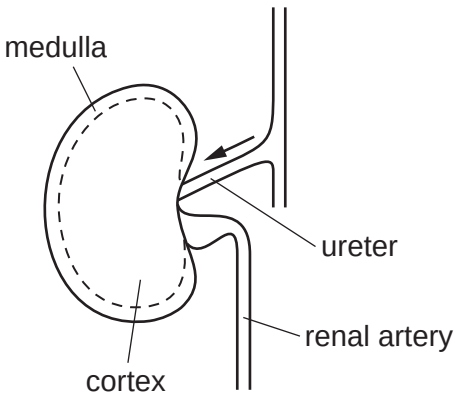
B



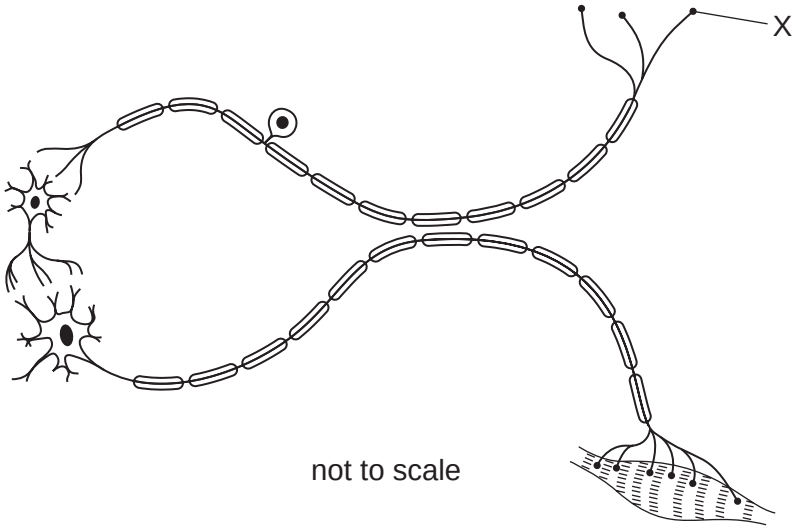
C



D



23 The diagram shows a reflex arc.



What is X?

A a relay neurone

B a synapse

C the effector

D the receptor

24 Which responses occur in the iris of the eye when a person walks from a dimly lit area to a brightly lit area?

	circular muscle	radial muscle
A	contract	contract
B	contract	relax
C	relax	contract
D	relax	relax

25 Which is the result of the release of adrenaline?

A constriction of pupils

B decrease in breathing rate

C decrease in pulse rate

D increase in blood glucose concentration

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26 Penicillin is an antibiotic that kills bacteria by preventing them from forming cell walls.

Why does penicillin **not** affect viruses?

A Viruses become resistant to penicillin.

B Viruses do not contain cytoplasm.

C Viruses do not have cell walls.

D Viruses reproduce very rapidly.

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 Which row correctly shows whether the nuclei of the cells are diploid or haploid?

	body cells	gametes	zygote
A	diploid	diploid	haploid
B	diploid	haploid	diploid
C	haploid	diploid	haploid
D	haploid	haploid	diploid

29 What is a feature of self-pollination?

A It improves the capacity of a species to respond to changes in the environment.

B It increases variation in the offspring.

C Pollen grains are transferred from the anther of a flower to the stigma of a flower on a different plant.

D Pollen grains are transferred from the anther of a flower to the stigma of a flower on the same plant.

30 Which hormone causes the lining of the uterus to become thick and glandular before ovulation?

A FSH

B LH

C oestrogen

D progesterone

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

A lymphocytes

B phagocytes

C platelets

D red blood cells

32 Which row describes the genetic code in DNA?

	what forms the genetic code	what the DNA codes for
A	sequence of amino acids	sequence of bases
B	sequence of amino acids	sequence of proteins
C	sequence of bases	sequence of amino acids
D	sequence of bases	sequence of proteins

33 Cell division by meiosis of a parent cell with 23 pairs of chromosomes will result in

A 2 cells, each with 23 pairs of chromosomes.

B 2 cells, each with 23 single chromosomes.

C 4 cells, each with 23 pairs of chromosomes.

D 4 cells, each with 23 single chromosomes.

34 Colour blindness is a condition that occurs more frequently in men than in women.

Which statement about this condition is correct?

A It affects the cornea.

B It can pass from father to son.

C It is a sex-linked characteristic.

D The gene is on the Y chromosome.

35 Which feature is an example of discontinuous variation?

A blood group

B body mass

C foot size

D height

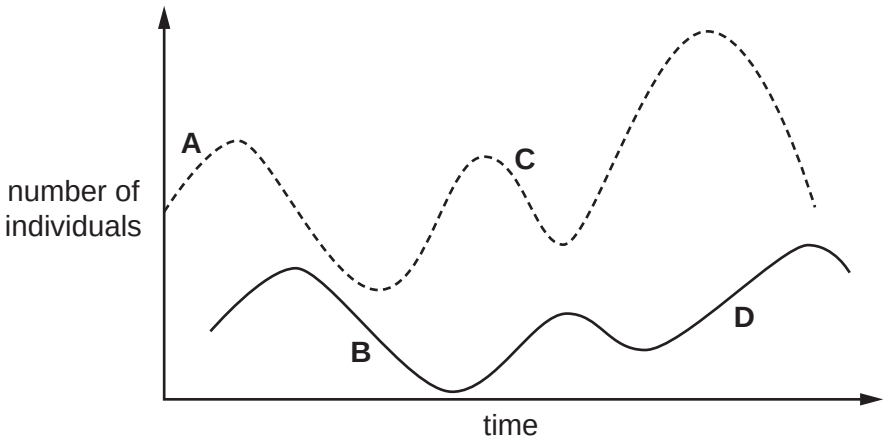
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36 In which processes is light energy converted to chemical energy?

	photosynthesis	plant respiration
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

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 feature of bacteria makes them useful in genetic engineering?

A They do not have mitochondria.

B They do not have vacuoles.

C They have plasmids.

D They have cell walls.

39 Why is yeast used in breadmaking?

A to produce alcohol

B to produce carbon dioxide

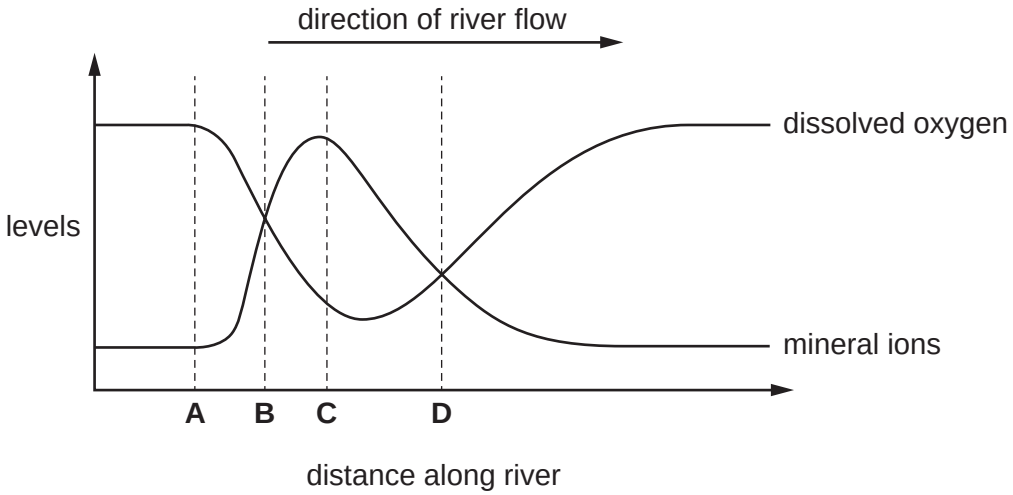
C to use up oxygen

D to use up sugar

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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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