Cambridge Assessment International Education

Cambridge IGCSE™

BIOLOGY **0610/23**

Paper 2 Multiple Choice (Extended) **October/November 2025**

45 minutes

You must answer on the multiple choice answer sheet.

You will need: Multiple choice answer sheet
Soft clean eraser
Soft pencil (type B or HB is recommended)

INSTRUCTIONS

- 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 multiple choice answer sheet.
- Follow the instructions on the multiple choice answer sheet.
- Write in soft pencil.
- Write your name, centre number and candidate number on the multiple choice answer sheet in the spaces provided unless this has been done for you.
- Do **not** use correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.

INFORMATION

- The total mark for this paper is 40.
- Each correct answer will score one mark.
- Any rough working should be done on this question paper.

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1 What is a characteristic of all living organisms?

A breathing

B photosynthesis

C reproduction

D transpiration

2 What are the two parts of the scientific name of an organism?

A genus followed by kingdom

B genus followed by species

C kingdom followed by genus

D kingdom followed by species

3 A palisade cell and a neurone are observed under a light microscope.

Which cell component is found only in the palisade cell?

A cell membrane

B cell wall

C cytoplasm

D nucleus

4 In a human, the diameter of the aorta as it leaves the heart is 36 mm.

The thickness of the wall of the aorta at this point is 9 mm.

What is the diameter of the lumen of the aorta at this point?

A 1800 m **B** 2700 μm **C** 18 000 μm **D** 27 000 μm

5 Diffusion may be defined as the net movement of particles from a region of their .....1..... concentration, to a region of their .....2..... concentration, where movement is .....3..... a concentration gradient.

Which words complete gaps 1, 2 and 3?

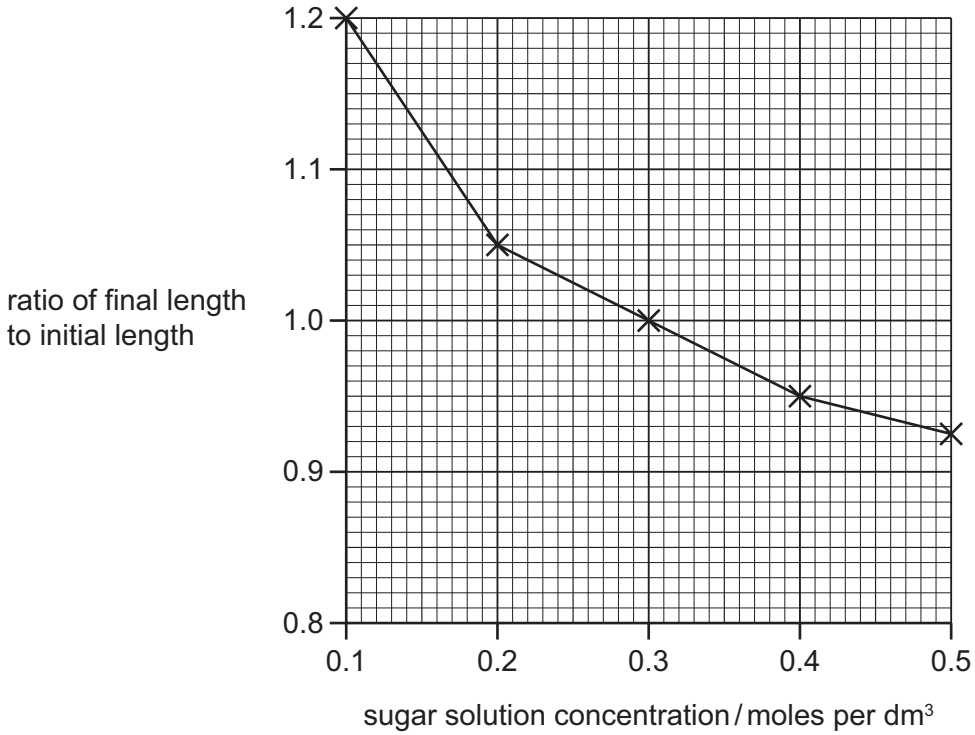
	1	2	3
A	higher	lower	down
B	higher	lower	up
C	lower	higher	down
D	lower	higher	up

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6 Cylinders of potato tissue were placed in sugar solutions of different concentrations and left overnight.

The lengths of the potato cylinders were measured before and after they were placed in the sugar solutions.

The graph shows the results of the investigation.



In which sugar solution concentrations did the potato cells gain water?

A 0.1 moles per dm^3 and 0.2 moles per dm^3

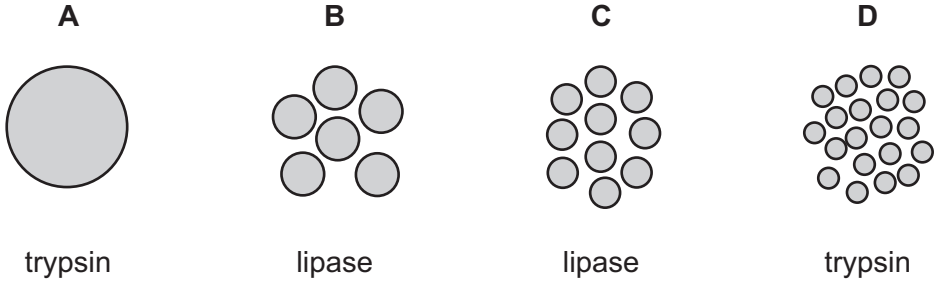
B 0.1 moles per dm^3 only

C 0.2 moles per dm^3 and 0.3 moles per dm^3

D 0.4 moles per dm^3 and 0.5 moles per dm^3

7 The diagrams show the same mass of oil arranged in drops of different sizes at the same temperature.

In which combination of oil drop size and enzyme will the oil be digested the fastest?



8 Which substance contains magnesium ions?

A cellulose

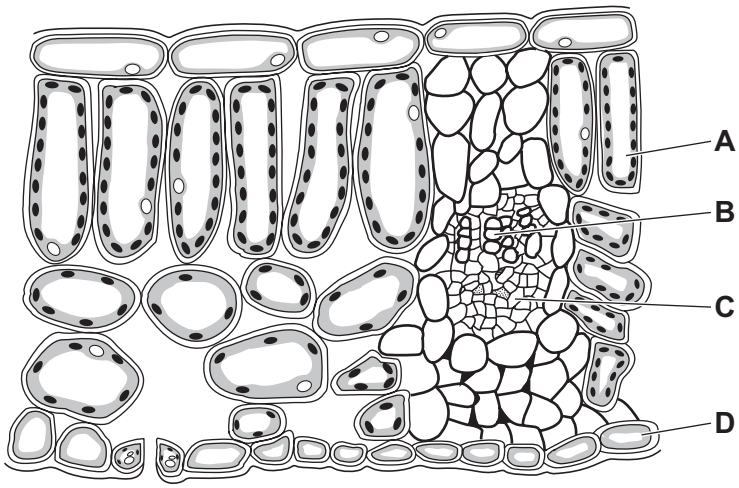
B chlorophyll

C glucose

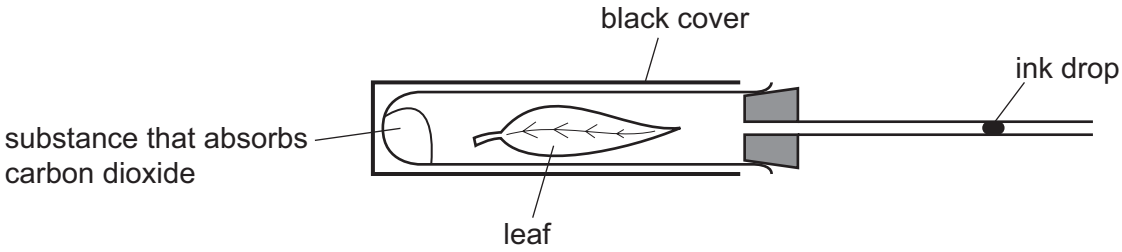
D glycerol

9 The diagram shows part of a cross-section of a leaf.

Which part is the xylem?



10 The diagram shows an experiment to investigate gas exchange in a leaf.



In which direction does the ink drop move and for what reason?

	direction	reason
A	towards the leaf	photosynthesis
B	towards the leaf	respiration
C	away from the leaf	photosynthesis
D	away from the leaf	respiration

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11 What is an example of chemical digestion?

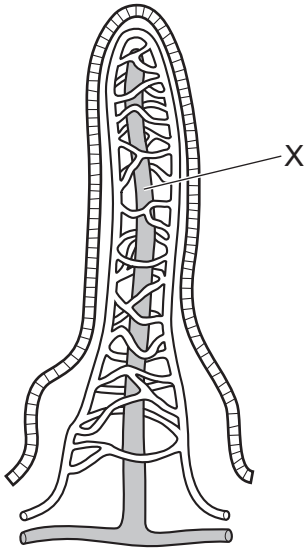
A breaking down starch into reducing sugars

B churning of food by muscular contractions of the stomach wall

C grinding of food by teeth

D mixing of food with bile

12 The diagram shows a villus.



Which row shows the name and function of the part labelled X?

	name	function
A	capillary	absorption of amino acids and glucose
B	capillary	absorption of fatty acids and glycerol
C	lacteal	absorption of amino acids and glucose
D	lacteal	absorption of fatty acids and glycerol

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[Turn over

13 Which environmental conditions will result in the highest rate of transpiration?

	high air humidity	very windy	low air temperature
A	no	no	yes
B	no	yes	no
C	yes	yes	yes
D	yes	no	no

14 Which statements describe sources and sinks?

1 Palisade mesophyll cells only act as sinks.

2 Roots can act as sinks.

3 Sink cells only receive glucose from the phloem.

4 Spongy mesophyll cells can act as sources.

A 1, 2, 3 and 4

B 1, 3 and 4 only

C 1 and 3 only

D 2 and 4 only

15 What is a feature of veins?

A one-cell-thick wall

B narrow lumen

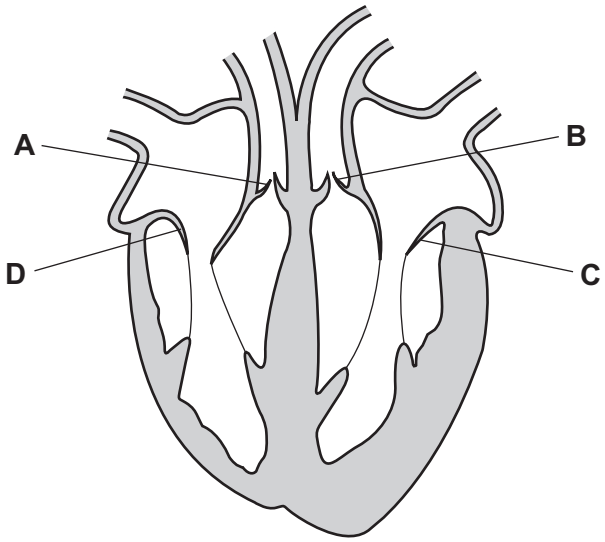
C thick muscular walls

D valves are present

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16 The diagram shows a section through a human heart.

Which structure is an atrioventricular valve in the right side of the heart?



17 What is an example of active immunity?

A antibody production after infection

B antibody transfer from mother to baby in breast milk

C antibody transfer from mother to fetus across the placenta

D an injection of antibodies that were produced by another individual

18 Which changes cause expiration?

	external intercostal muscles	diaphragm
A	contract	relaxes and moves down
B	contract	relaxes and moves up
C	relax	relaxes and moves down
D	relax	relaxes and moves up

19 What shows the pathway of urea from where it is produced to where it is excreted?

A kidney → renal artery → heart → lungs → heart → renal vein → bladder

B kidney → renal vein → heart → lungs → heart → renal artery → bladder

C liver → hepatic artery → heart → lungs → heart → renal artery → kidney

D liver → hepatic vein → heart → lungs → heart → renal artery → kidney

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20 Which row shows the state of the ciliary muscles and suspensory ligaments when the eye is focusing on a near object?

	ciliary muscles	suspensory ligaments
A	contracted	slack
B	contracted	tense
C	relaxed	slack
D	relaxed	tense

21 Events that occur at a synapse are listed.

They are **not** in the correct order.

1 An impulse is stimulated in the next neurone.

2 An impulse stimulates the release of neurotransmitter molecules from vesicles into the synaptic gap.

3 Neurotransmitter molecules bind with receptor proteins on the next neurone.

4 The neurotransmitter molecules diffuse across the gap.

What is the actual sequence of events?

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

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

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

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

22 Which actions can prevent a mammal's internal body temperature falling too low?

A shivering and vasoconstriction

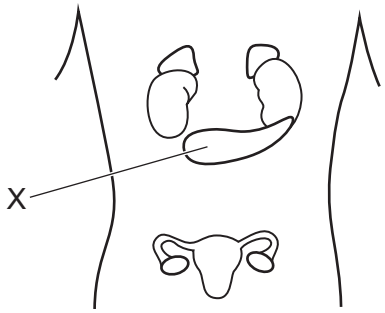
B shivering and vasodilation

C sweating and vasoconstriction

D sweating and vasodilation

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23 The diagram shows the position of some of the human endocrine glands.



Which hormone is secreted by X?

A adrenaline

B insulin

C oestrogen

D testosterone

24 Which row shows the correct speed and duration for the type of control?

	type of control	speed of action	duration of effect
A	hormonal	fast	short
B	hormonal	slow	long
C	nervous	fast	long
D	nervous	slow	short

25 A student writes four statements about auxin.

1 Auxin becomes more concentrated on the lower side of a horizontal stem.

2 Auxin becomes more concentrated on the side of the shoot that has more light.

3 Auxin is made in the shoot tip.

4 Auxin prevents cell elongation in the shoot.

Which statements describe what happens during chemical control of plant growth?

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

26 What can antibiotics treat?

A all diseases caused by pathogens

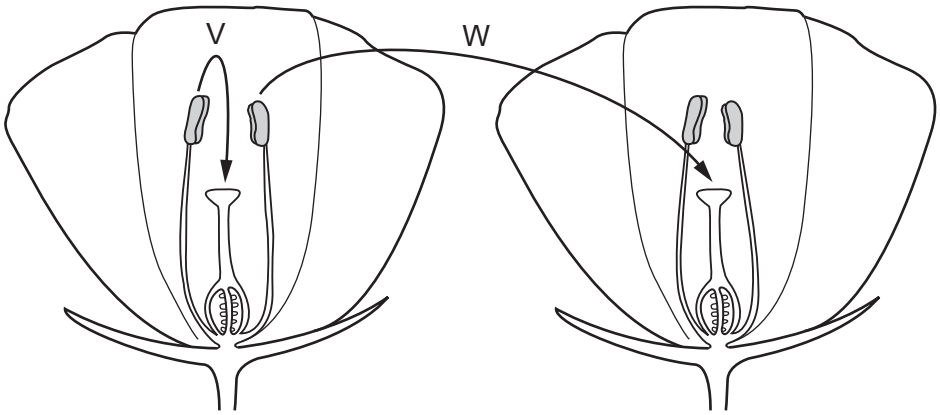
B cholera

C HIV (human immunodeficiency virus)

D rickets

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27 The diagram shows two methods of pollination, V and W. The two flowers are on different plants of the same species.



A student made three conclusions about these two methods of pollination.

1 Method V will produce genetically identical offspring.

2 Method W will produce genetically different offspring.

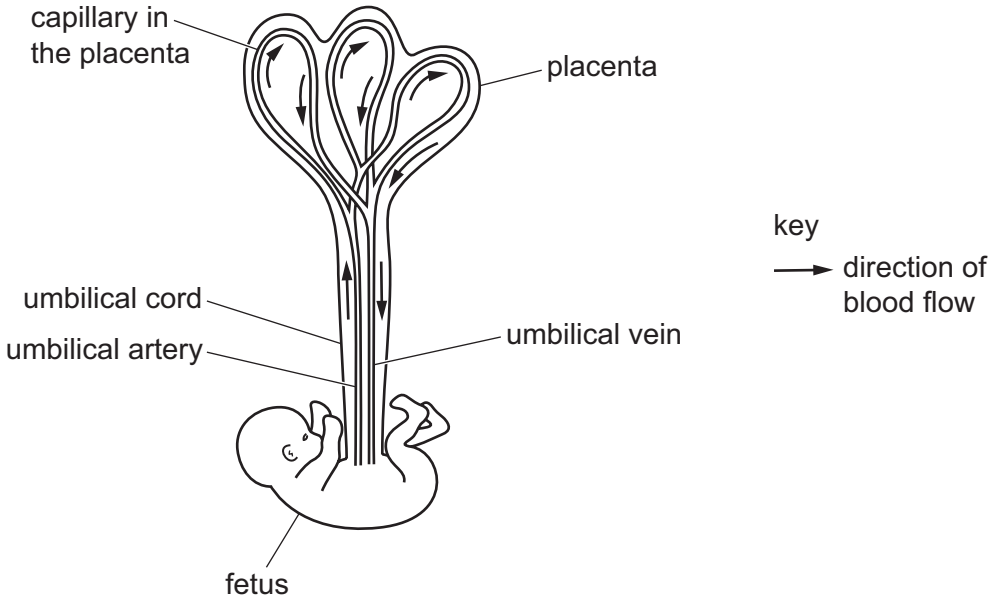
3 Method W increases the ability of the species to adapt to its surroundings.

Which conclusions are correct?

A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

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28 The diagram shows the blood supply between a fetus and a placenta.



Which row shows the concentration of substances in the umbilical artery and umbilical vein?

	umbilical artery	umbilical vein
A	high nutrient concentration	high urea concentration
B	high urea concentration	high carbon dioxide concentration
C	low carbon dioxide concentration	low nutrient concentration
D	low oxygen concentration	low urea concentration

29 Which hormone is produced by cells in the placenta of a developing fetus?

A FSH

B LH

C testosterone

D progesterone

30 What are alleles?

A a pair of chromosomes

B different versions of the same gene

C the total number of genes on one chromosome

D two genes side by side on the same chromosome

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[Turn over

31 Polydactyly in cats is a dominant condition that causes affected cats to be born with extra toes.

What is the probability of two cats that are heterozygous for polydactyly having an offspring with **no** extra toes?

A 0.125 **B** 0.25 **C** 0.50 **D** 0.75

32 Which statement describes red-green colour blindness?

A It is an example of codominance.

B It is more common in females than in males.

C It only occurs in males.

D The recessive allele is located on an X chromosome.

33 Four features of cell division are listed.

1 Haploid cells are produced.

2 New cells are genetically identical.

3 It is a reduction division.

4 It results in variation.

Which features would be associated with meiosis?

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

34 Which term is used to describe a characteristic that helps an organism to survive and reproduce in its environment?

A adaptive feature

B competition

C observable feature

D phenotype

35 Which process removes carbon dioxide from the atmosphere?

A combustion

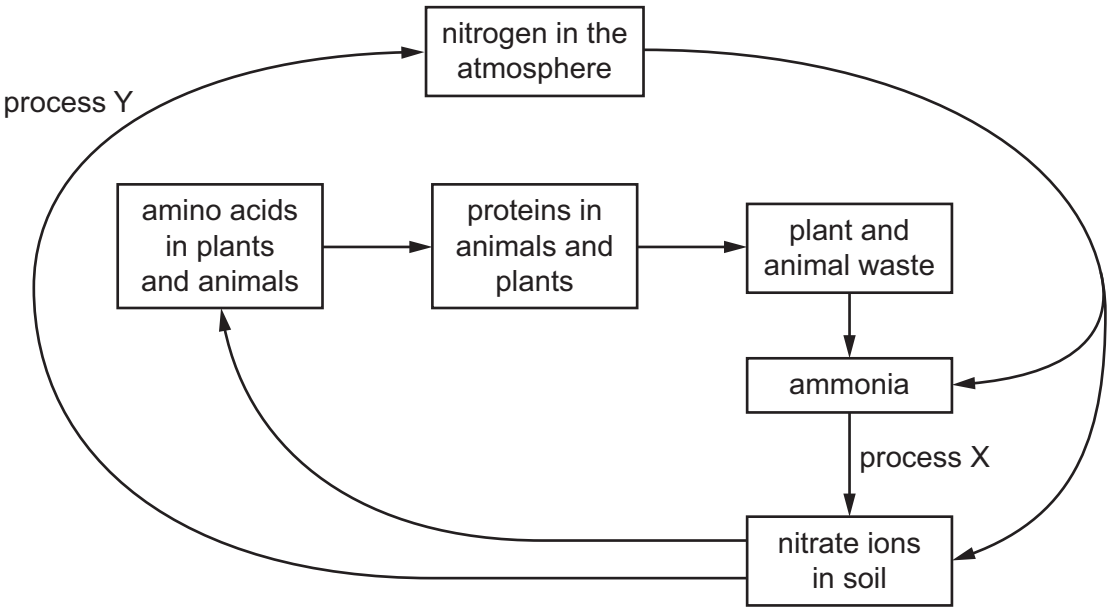
B decomposition

C photosynthesis

D respiration

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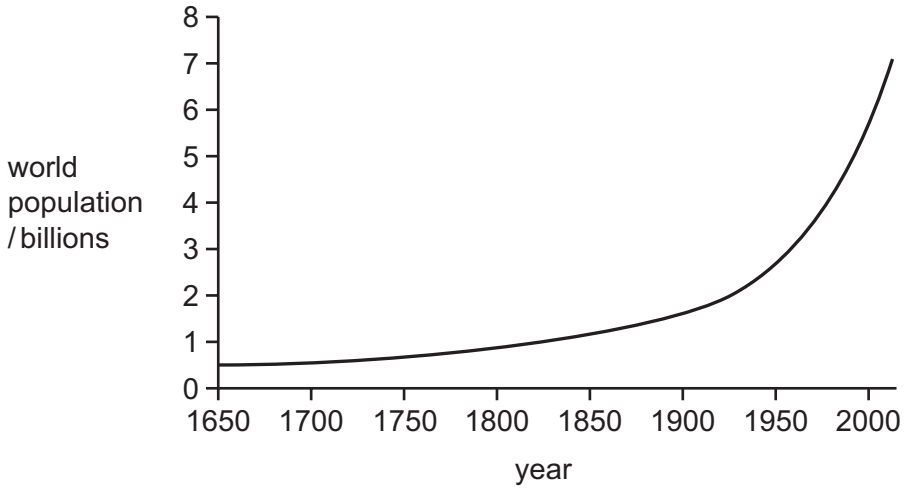
36 The diagram shows part of the nitrogen cycle.



What are the names of process X and process Y?

	X	Y
A	deamination	denitrification
B	nitrogen fixation	deamination
C	nitrogen fixation	nitrification
D	nitrification	denitrification

37 The graph shows how the population of the world increased from 1650 until the present day.



Which phases of a sigmoid curve of population growth are **not** shown on this graph?

A death and lag

B exponential (log) and stationary

C lag and exponential (log)

D stationary and death

38 In which trophic level are herbivores found?

A primary consumers

B quaternary consumers

C secondary consumers

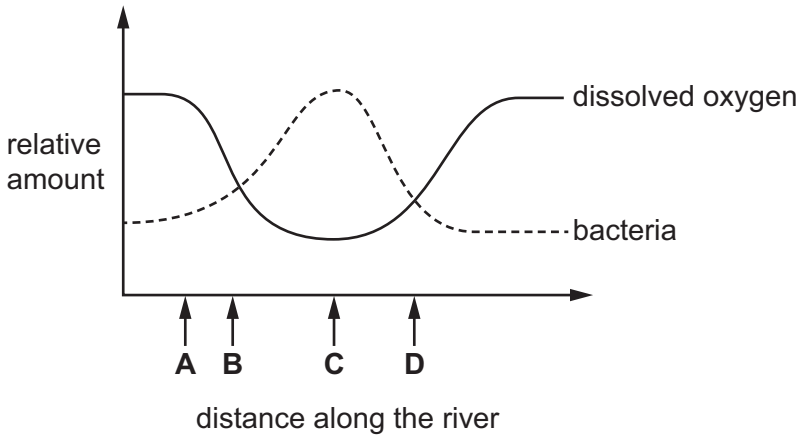
D tertiary consumers

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39 The graph shows the relative amounts of bacteria and dissolved oxygen at different locations along a river.

Fertiliser has entered the river.

At which distance along the river did the fertiliser enter the river?



40 Human insulin can be produced in large quantities by genetically modified bacteria.

Four of the steps in the processes of genetic modification and insulin production are listed.

1 Insulin is removed from the bacterial culture.

2 An enzyme is used to cut out the insulin gene from a human chromosome.

3 The insulin gene is placed into the plasmid of a bacterium.

4 Bacteria with the insulin gene reproduce very rapidly.

What is the order of these steps?

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

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

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

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

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