Cambridge Assessment International Education

Cambridge IGCSE™

BIOLOGY **0610/21**

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

IB25 06_0610_21/5RP
© UCLES 2025

1 Which characteristic of living things requires carbon dioxide to diffuse into a leaf?

View solution

A excretion

B movement

C nutrition

D respiration

2 Which set of features is characteristic only of birds?

View solution

A hair and wings

B hard-shelled eggs and feathers

C scales and soft-shelled eggs

D wings and soft-shelled eggs

3 Which structures are found in both plant and animal cells?

View solution

A cell walls and cell membranes

B nuclei and cell walls

C cytoplasm and chloroplasts

D cell membranes and nuclei

4 A student made the following statements about the movement of ions by active transport.

View solution

1 It is the net movement of particles from a low concentration to a high concentration.

2 It is the net movement of particles from a high concentration to a low concentration.

3 It requires the use of energy from respiration.

4 It can only take place in living cells.

Which statements are correct?

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

5 A DNA molecule contains pairs of bases.

View solution

What is a correct combination of a pair of bases?

A A and G **B** C and A **C** G and T **D** T and A

© UCLES 2025

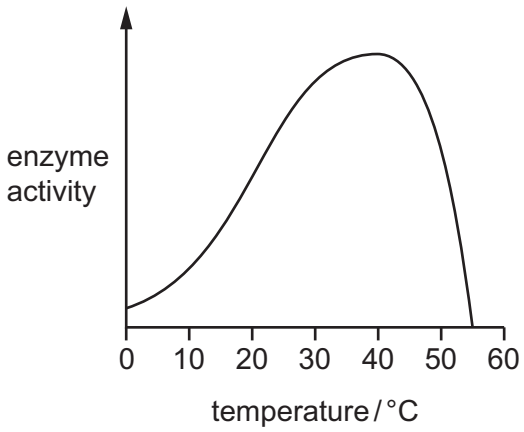
6 What is the test for protein?

View solution

	name of the test	heat	colour change
A	Benedict's	yes	blue to purple
B	biuret	yes	blue to red
C	biuret	no	blue to purple
D	Benedict's	no	blue to red

7 The graph shows how enzyme activity is affected by temperature.

View solution



Why is enzyme activity lower at 55 °C than it is at 40 °C?

A Heat has killed the enzyme.

B The enzyme has been used up.

C The reactants are moving faster.

D The substrate is less likely to fit into the active site.

8 Which descriptions of adaptations for photosynthesis are correct for spongy mesophyll tissue?

View solution

	air spaces for efficient gas exchange	long, rectangular cells to absorb light
A	yes	yes
B	yes	no
C	no	yes
D	no	no

© UCLES 2025

9 The table shows the recommended daily allowance (RDA) of some nutrients for young children.

The table also shows the masses of these nutrients eaten by a child in one day.

View solution

	mass of vitamin C / mg	mass of vitamin D / μg	mass of iron / mg	mass of calcium / mg
RDA	50	10	11	260
mass eaten in one day	54	5	11	150

Which conditions will the child be at risk of developing if they consume the same diet for a long period of time?

1 anaemia (**not** having enough red blood cells)

2 rickets

3 scurvy

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

10 Which term is used for the uptake and use of nutrients by cells?

View solution

A absorption

B assimilation

C egestion

D ingestion

11 What is the function of trypsin in digestion?

View solution

A It catalyses the breakdown of maltose in the mouth.

B It catalyses the breakdown of maltose in the small intestine.

C It catalyses the breakdown of protein in the small intestine.

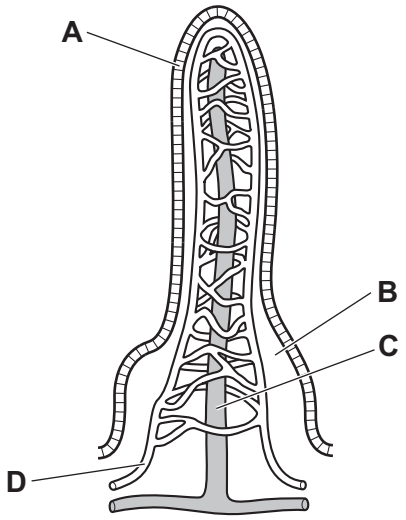
D It catalyses the breakdown of protein in the stomach.

© UCLES 2025

12 The diagram shows the structure of a villus.

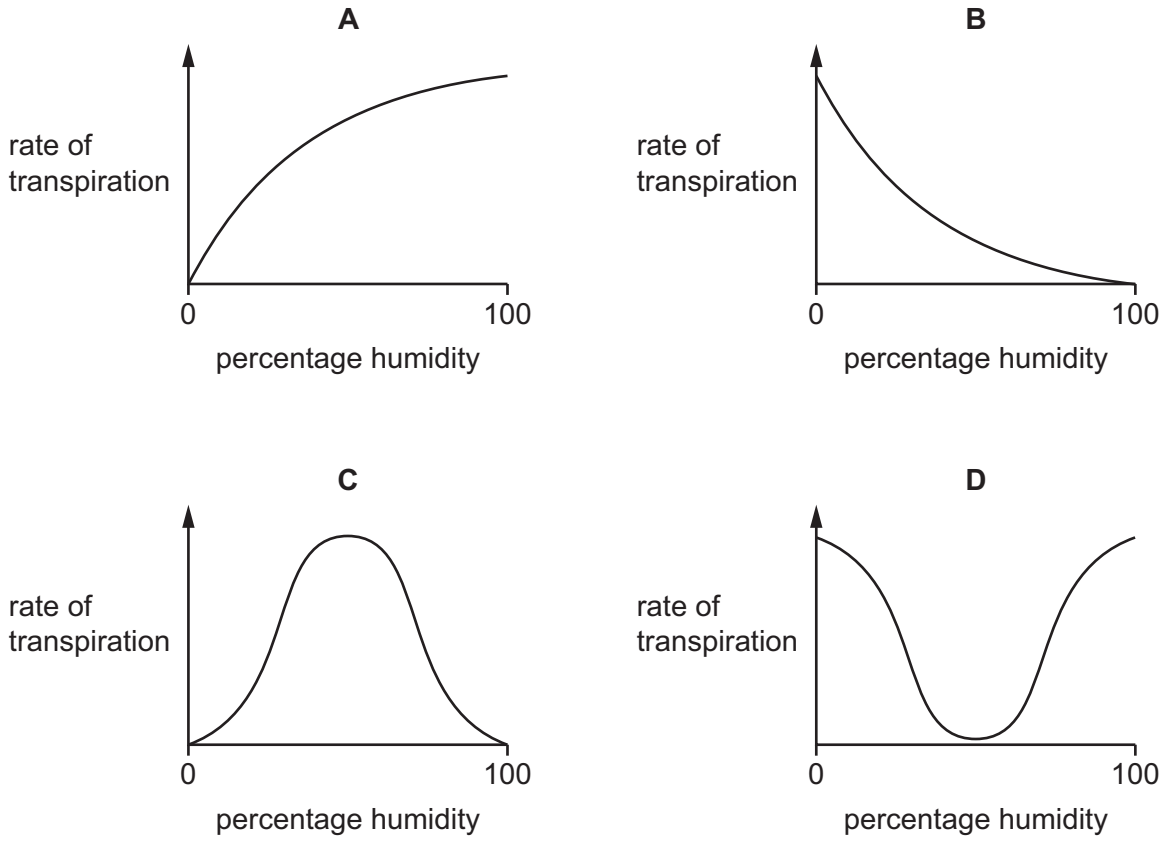
View solution

Which label shows a lacteal?



13 Which graph shows the effect of humidity in the air on the rate of transpiration in a plant?

View solution



14 In some countries, spring is the time of year when daffodil plants have green leaves and produce flowers.

View solution

Which parts of the daffodil plants act as sources and sinks in spring?

	flowers	leaves
A	sink	sink
B	source	source
C	sink	source
D	source	sink

15 In a fish, what is the sequence of structures that blood passes through after it leaves the heart?

View solution

A gills → muscles → heart

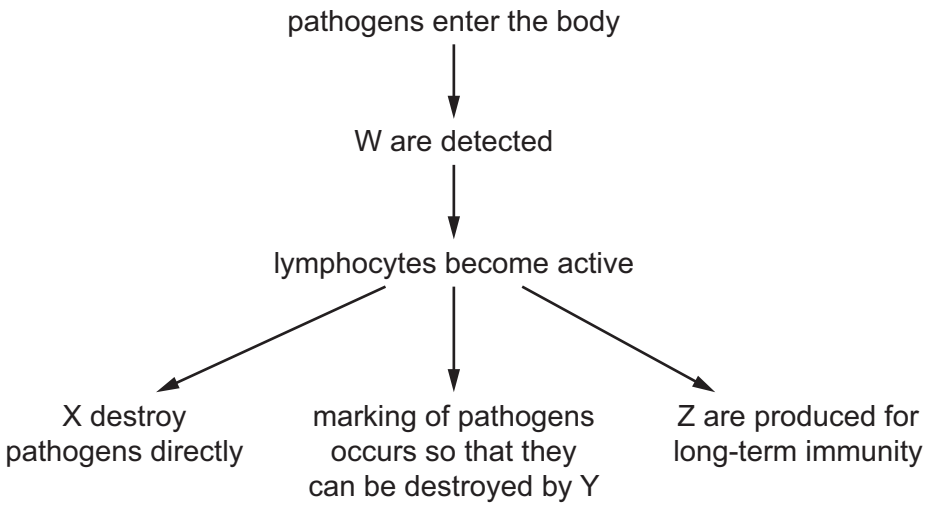
B gills → heart → muscles → heart

C muscles → gills → heart

D muscles → heart

16 The diagram shows what happens in the body during active immunity.

View solution



Which structures or cells represent W, X, Y and Z?

	antibodies	antigens	memory cells	phagocytes
A	W	X	Y	Z
B	W	X	Z	Y
C	X	W	Y	Z
D	X	W	Z	Y

© UCLES 2025

17 Cholera is a disease caused by a bacterium called *Vibrio cholerae* which produces a toxin in the infected person's gut.

View solution

What is the effect of this toxin?

A The toxin causes loss of water from the gut into the blood.

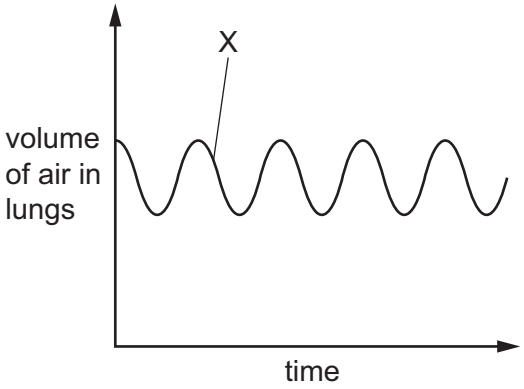
B The toxin causes loss of water from the gall bladder into the blood.

C The toxin causes water to enter the gut from the blood.

D The toxin causes water to enter the gall bladder from the blood.

18 The graph shows how the volume of air in lungs changes when a person is breathing at rest.

View solution



Which processes are occurring to change the volume at the point marked X?

A The diaphragm is relaxing and the external intercostal muscles are relaxing.

B The diaphragm is contracting and the internal intercostal muscles are contracting.

C The diaphragm is contracting and the internal intercostal muscles are relaxing.

D The diaphragm is relaxing and the external intercostal muscles are contracting.

19 The processes listed occur in living organisms.

View solution

1 cell division

2 diffusion

3 muscle contraction

4 osmosis

Which processes require energy from respiration?

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

© UCLES 2025

20 What is a role of the glomerulus?

View solution

A assembling amino acids into proteins

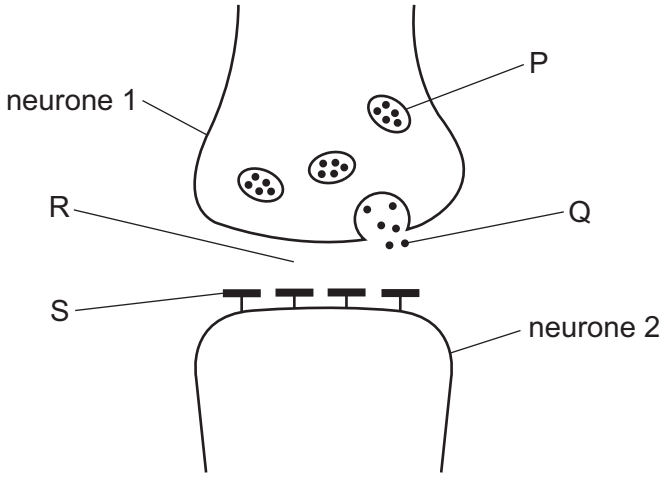
B filtration of water, glucose, urea and ions from the blood

C reabsorption of glucose, ions and water back into the blood

D removal of the nitrogen-containing part of amino acids to form urea

21 The diagram shows a synapse.

View solution



What are the labelled parts?

	P	Q	R	S
A	synaptic gap	neurotransmitter	vesicle	receptor
B	synaptic gap	receptor	vesicle	neurotransmitter
C	vesicle	neurotransmitter	synaptic gap	receptor
D	vesicle	receptor	synaptic gap	neurotransmitter

22 Which row shows the function of rod cells?

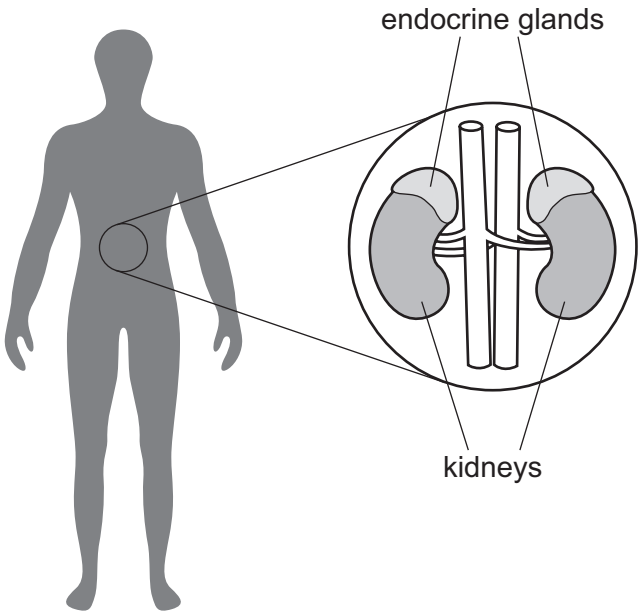
View solution

	night vision	colour vision
A	yes	yes
B	yes	no
C	no	yes
D	no	no

© UCLES 2025

23 The diagram shows the positions of two endocrine glands in the human body.

View solution



What is a response of the body to the hormone released from these glands?

A a decrease in heart rate

B a decrease in blood glucose concentration

C an increase in pupil diameter

D the development of secondary sexual characteristics

24 What is a response of the human body to overheating?

View solution

A vasoconstriction of arterioles

B vasoconstriction of veins

C vasodilation of arterioles

D vasodilation of veins

25 What is an example of phototropism?

View solution

A the growth of a root in the direction of gravity

B the growth of a shoot towards light

C the release of energy from glucose using light

D the synthesis of glucose using light

© UCLES 2025

26 Which statement describes the effect of antibiotics?

View solution

A Antibiotics do **not** affect bacteria or viruses.

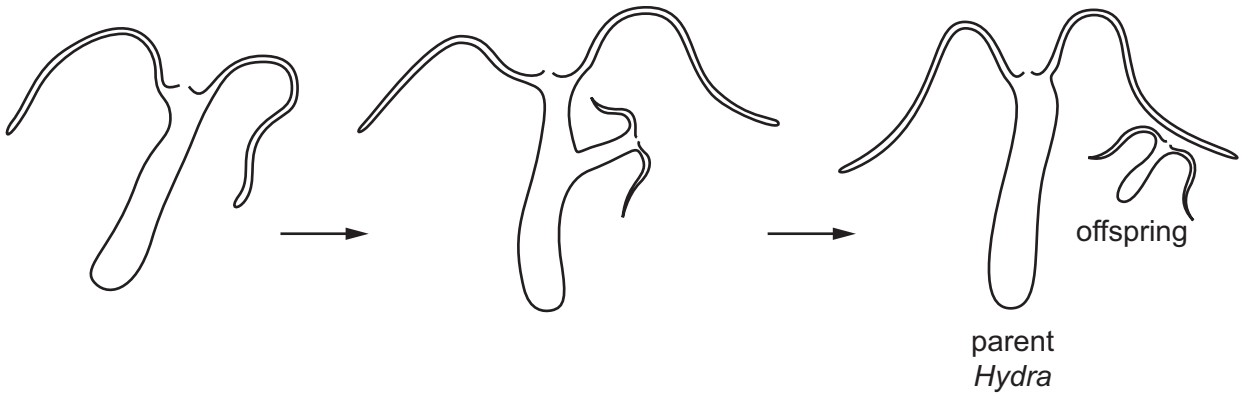
B Antibiotics kill bacteria but do **not** affect viruses.

C Antibiotics kill both bacteria and viruses.

D Antibiotics kill viruses but do **not** affect bacteria.

27 The diagram shows one parent *Hydra* growing and releasing an offspring from the side of its body.

View solution

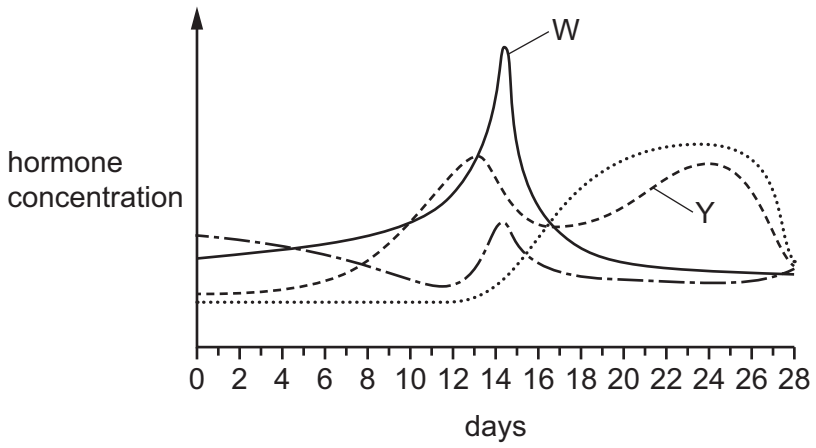


Which row is correct?

	parent and offspring are genetically identical	involves asexual reproduction
A	yes	yes
B	yes	no
C	no	yes
D	no	no

28 The diagram shows the changing concentrations of some hormones involved in the menstrual cycle.

View solution



Which letters identify two of the hormones?

A W is FSH and Y is oestrogen.

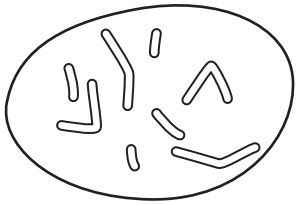
B W is LH and Y is oestrogen.

C W is progesterone and Y is FSH.

D W is progesterone and Y is LH.

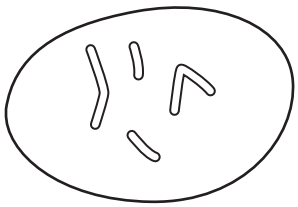
29 The diagram shows the chromosomes in the nucleus of a cell that divides by mitosis.

View solution

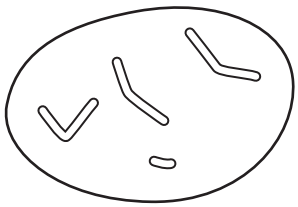


Which diagram shows the chromosomes in the nucleus of one of the daughter cells produced?

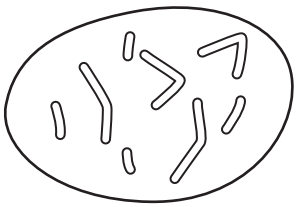
A



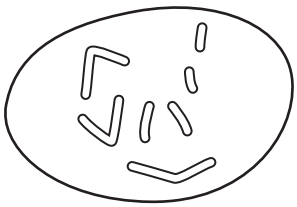
B



C



D



© UCLES 2025

30 A farmer bred together male cattle with white hair and female cattle with red hair. All the offspring produced had roan hair (a mixture of red and white).

He then repeatedly bred together two roan cattle, and the offspring were in the ratio of 1 red : 2 roan : 1 white.

View solution

What explains why the farmer obtained this ratio?

A The red phenotype is dominant to the white phenotype.

B The roan phenotype is an example of codominance.

C The roan phenotype is dominant to the red phenotype and the white phenotype.

D The white phenotype is dominant to the red phenotype.

View solution

31 Phagocytes and neurones are two types of specialised cell.

Which statements are correct?

1 Phagocytes and neurones express the same genes.

2 Both types of cell have the same genes.

3 Both types of cell only express the genes that make the proteins needed for the cell to function.

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

View solution

32 The table shows some features of leaves.

Which leaf is adapted to survive in hot, dry habitats?

	number of stomata	thickness of waxy cuticle	surface area of leaf
A	many	thick	small
B	many	thin	large
C	few	thick	small
D	few	thin	large

© UCLES 2025

33 Which row correctly describes a type of selection?

View solution

	type of selection	humans involved	example
A	artificial	no	production of farmed animals that produce lots of milk
B	artificial	yes	production of bacteria that are resistant to antibiotics
C	natural	yes	production of insulin through genetic modification of bacteria
D	natural	no	production of wild animals with long necks to reach tree leaves as a food source

34 Which statement about a pyramid of energy for a food chain is correct?

View solution

A It shows how energy is lost at each trophic level.

B It shows the energy stored at each trophic level.

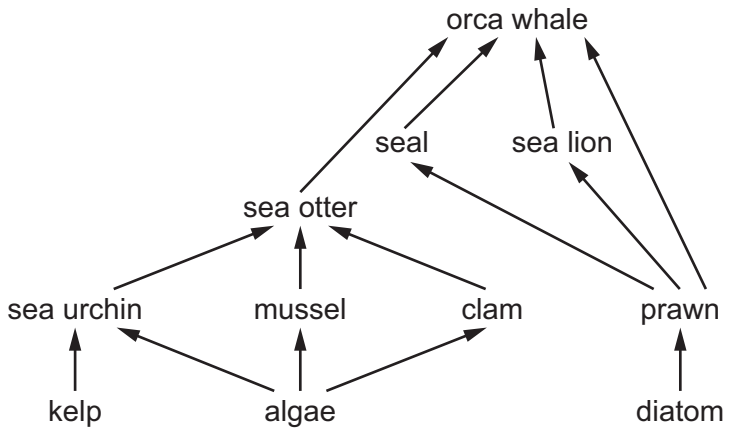
C It shows the input of energy from the principal source.

D It shows the total energy stored within an ecosystem.

© UCLES 2025

35 The food web shows part of an ocean ecosystem.

View solution



Which row shows the number of secondary consumers and the number of tertiary consumers in the food web?

	number of secondary consumers	number of tertiary consumers
A	three	one
B	four	one
C	three	two
D	four	two

© UCLES 2025

36 A student investigated the effect of high temperature on the production of nitrate ions in soil.

View solution

Two samples of soil were taken. One sample was heated to 100 °C.

All the nitrate ions were completely removed from both soil samples.

Ammonium ions were then added to both soil samples.

After two weeks, both soil samples were tested for the presence of nitrate ions.

The results are shown.

soil sample	nitrate ions present or absent
not heated to 100 °C	present
heated to 100 °C	absent

Which statement explains the results?

A Heating the soil broke down the nitrate ions.

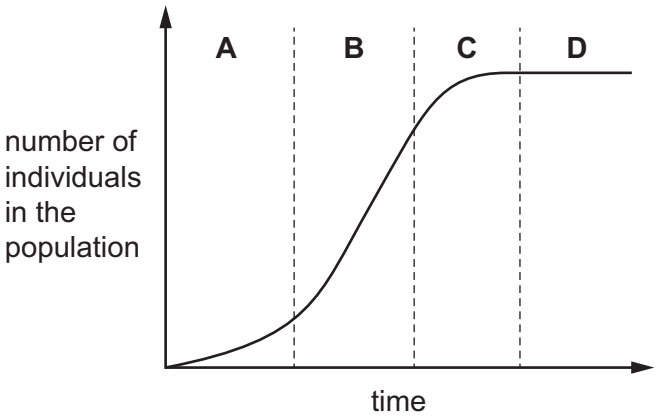
B Heating the soil increased the activity of denitrifying bacteria.

C Heating the soil killed nitrifying bacteria.

D Heating the soil killed nitrogen-fixing bacteria.

37 Which letter represents the lag phase in the population graph shown?

View solution



38 Which term describes the number of different species living in an area?

View solution

A biodiversity

B conservation

C ecosystem

D population

39 Which source of pollution can cause eutrophication?

View solution

A carbon dioxide

B methane

C non-biodegradable plastic

D sewage

40 Some of the processes involved in the production of insulin by genetic modification are listed.

View solution

1 cutting of bacterial plasmid DNA with restriction enzymes

2 expression in bacteria of the human gene to make insulin

3 insertion of recombinant plasmids into bacteria

4 multiplication of bacteria containing recombinant plasmids

In which order do these processes occur?

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

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

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

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

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 Assessment International Education Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cambridgeinternational.org after the live examination series.

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

© UCLES 2025