Cambridge Assessment International Education

Cambridge IGCSE™

BIOLOGY **0610/22**

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.

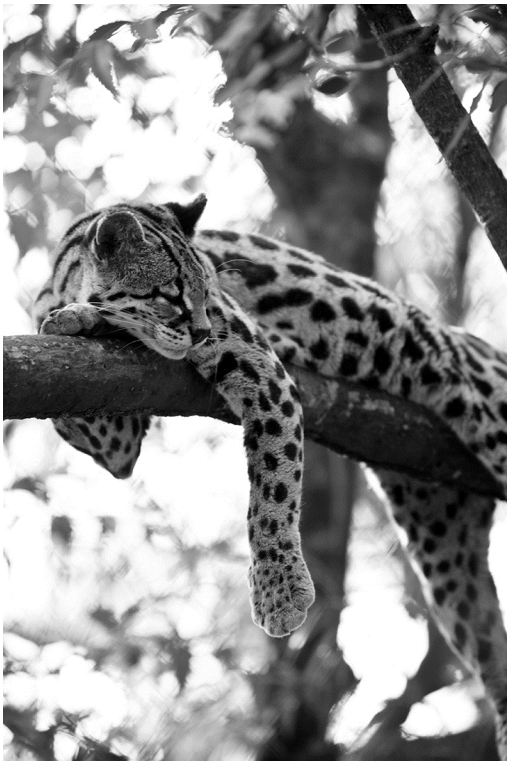
INFORMATION

- 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.

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[Turn over

1 The photograph shows an animal called a margay.



Four processes that occur in the margay are listed.

- excretion
- growth
- digestion
- respiration

How many of the processes that occur in the margay are characteristics of all living organisms?

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

2 Part of the base sequence of DNA from four species was determined.

species 1	T C A G G A T T
species 2	T G A G C A A T
species 3	T G A G C A A G
species 4	T G A G G A T T

Which two species are the **least** closely related?

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

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3 A single-celled organism has chloroplasts, a cell wall and a nucleus.

Which kingdom is this organism placed in?

A fungus

B plant

C prokaryote

D protoctist

4 What is a leaf?

A a cell

B an organ

C an organ system

D a tissue

5 A student measured the length of a structure using a microscope.

The magnification used was ×250.

The image size of the structure was 5.00 mm.

What was the actual length of the structure?

A 1.25×10^{3} mm

B 1.25×10^{3} μm

C 2.00×10^{1} μm

D 2.00×10^{-5} μm

6 Which row shows the conditions when diffusion of oxygen into the blood is fastest?

	alveolar surface area	concentration gradient	diffusion path distance
A	high	high	short
B	high	low	short
C	low	high	long
D	low	low	long

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7 Uncooked potato cylinders of identical size were placed in four different liquids for two hours.

The different liquids are listed.

1 pure water

2 a sugar solution that was less concentrated than the contents of the potato cells

3 a sugar solution that was more concentrated than the contents of the potato cells

4 a sugar solution that was the same concentration as the contents of the potato cells

In which liquids will the potato cylinders increase in length?

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

8 What is the correct definition of enzymes?

A carbohydrates that act as biological catalysts

B carbohydrates that act as substrates

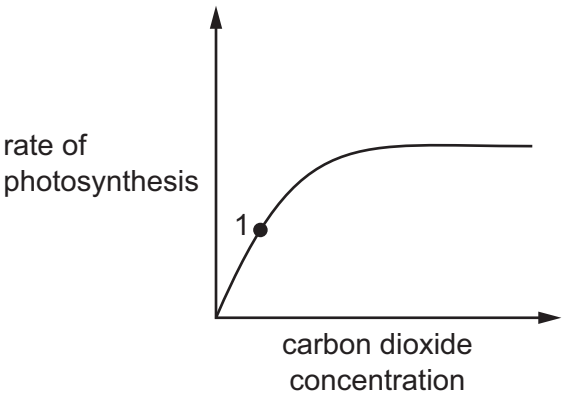
C proteins that act as biological catalysts

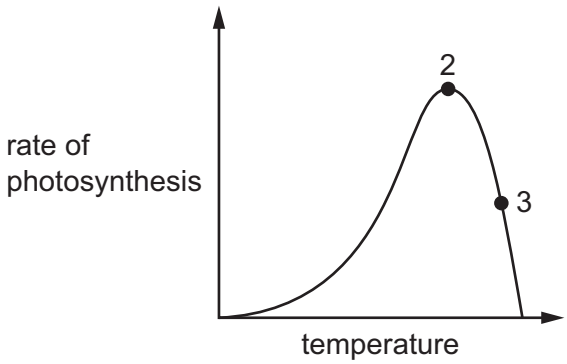
D proteins that act as substrates

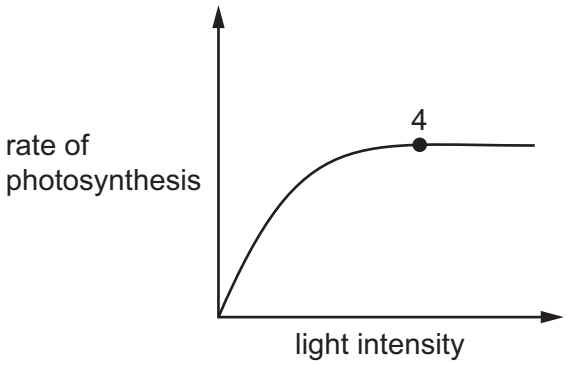
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9 A student investigated how the rate of photosynthesis is affected by carbon dioxide concentration, temperature and light intensity.

The graphs show the results.







What is a correct statement for these results?

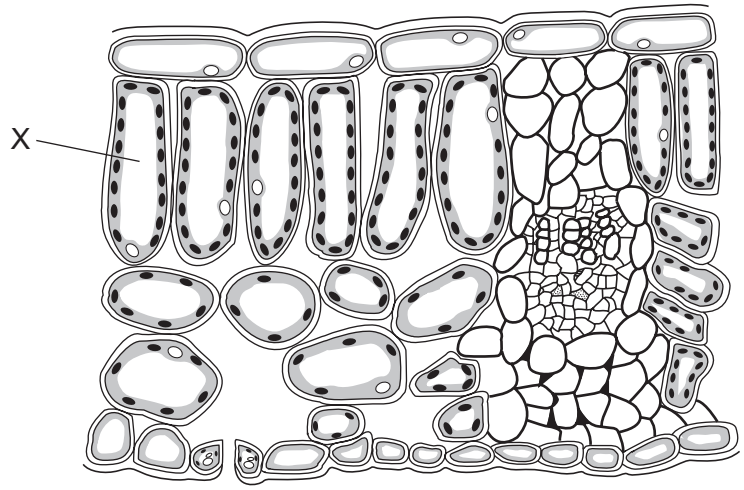
A Carbon dioxide concentration is a limiting factor at 1.

B No enzymes are denatured at 3.

C Light intensity is a limiting factor at 4.

D Temperature is a limiting factor at 2.

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



What is the cell labelled X?

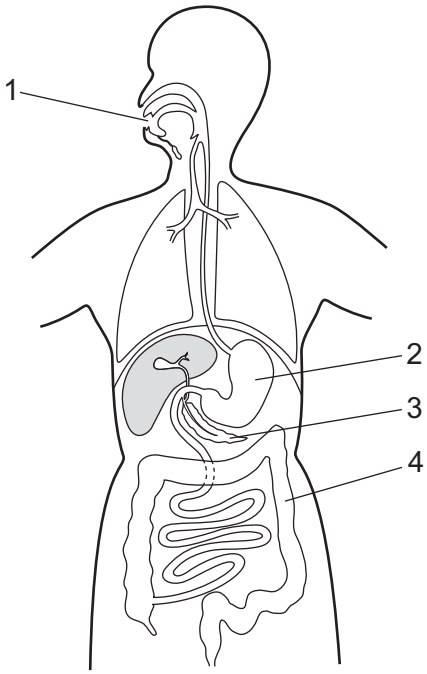
A epidermis

B guard cell

C palisade mesophyll

D spongy mesophyll

11 In which parts of the digestive system does physical digestion occur?



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

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12 The table shows the substrates and end products in four enzyme-controlled chemical reactions.

Which reaction was controlled by lipase?

	substrate	end product
A	maltose	starch
B	oil	fatty acids and glycerol
C	protein	amino acids
D	starch	maltose

13 What is the function of microvilli in the small intestine?

A conduction of electrical impulses

B increasing surface area for absorption

C movement of food particles

D movement of mucus

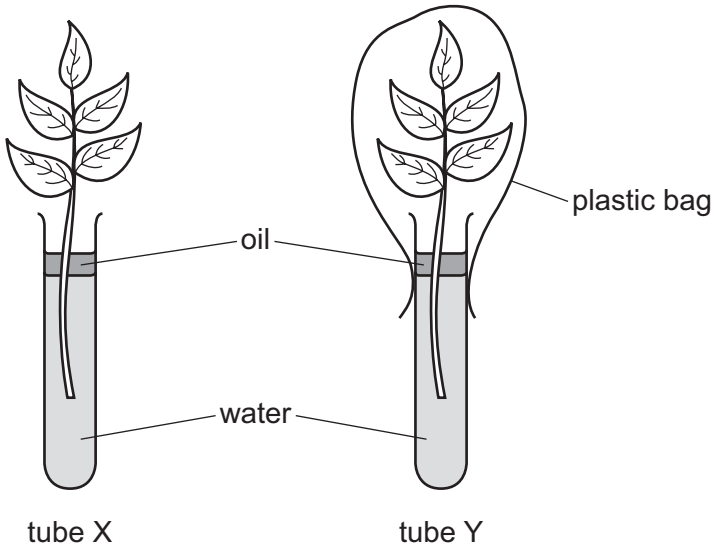
14 Which row shows the features of xylem vessels?

	vessel walls	mitochondria present
A	thick	yes
B	thick	no
C	thin	yes
D	thin	no

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[Turn over

15 A student wanted to investigate the effect of humidity on transpiration. She set up two sets of apparatus with identical-sized plants of the same species.



The masses of the water in both tubes were measured at the start of the investigation and again after five days. The table shows the results of the investigation.

tube	mass of the water in the tube at the start / g	mass of the water in the tube at the end / g
X	40.3	34.6
Y	41.0	39.4

Which statement describes and explains these results?

A Transpiration in tube Y was higher than in tube X as the plastic bag decreased the humidity.

B Transpiration in tube Y was higher than in tube X as the plastic bag increased the humidity.

C Transpiration in tube Y was lower than in tube X as the plastic bag decreased the humidity.

D Transpiration in tube Y was lower than in tube X as the plastic bag increased the humidity.

16 What is an advantage of a double circulatory system?

A It allows the mixing of oxygenated and deoxygenated blood.

B It can keep blood pressure high in the lungs.

C Less carbon dioxide is removed from the body cells.

D Oxygen is supplied to body cells by blood at high pressure.

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17 Which structure in the heart separates oxygenated and deoxygenated blood?

A atrioventricular valve

B muscle wall of left atrium

C semilunar valve

D septum

18 Which row shows the features of a vein?

	relative thickness of the wall to total vessel diameter	diameter of the lumen	presence or absence of valves
A	thick	large	absent
B	thick	small	present
C	thin	small	absent
D	thin	large	present

19 Three statements about immunity are listed.

1 The transfer of antibodies from mother to baby in breast milk is an example of passive immunity.

2 Passive immunity results in long-term immunity because of the production of memory cells.

3 Active immunity is gained after vaccination with antigens.

Which statements 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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20 The table shows the breathing rate and the average total volume of air breathed by a student when exercising for 20 minutes.

time / minutes	breathing rate / breaths per minute	average total volume of air breathed / cm^3 per minute
0	12	5 000
5	12	9 000
10	12	15 000
15	18	20 000
20	22	25 000

Which conclusion can be made from the data in the table about the effect of exercise on breathing?

A Between 0 minutes and 10 minutes, there is no change to the depth of breathing.

B Between 0 minutes and 10 minutes, the depth of breathing increases.

C Between 10 minutes and 20 minutes, there is no change to the rate of breathing.

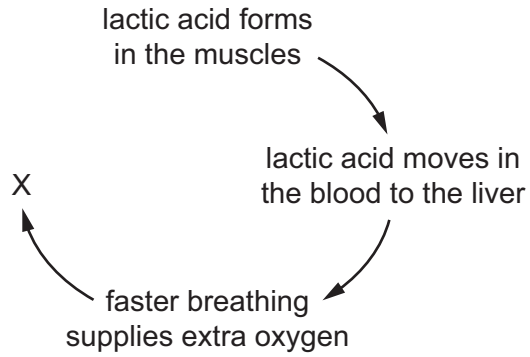
D Between 15 minutes and 20 minutes, the depth of breathing decreases.

21 What is the chemical formula of glucose?

A $C_6H_6O_6$ **B** C_6HO_6 **C** $C_6H_{12}O_6$ **D** $C_{12}H_{12}O_6$

22 After a race, athletes experience oxygen debt.

The diagram shows how the oxygen debt is removed.



What happens at X?

A aerobic respiration of glucose

B aerobic respiration of lactic acid

C anaerobic respiration of glucose

D anaerobic respiration of lactic acid

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23 Which organ produces urea?

A bladder

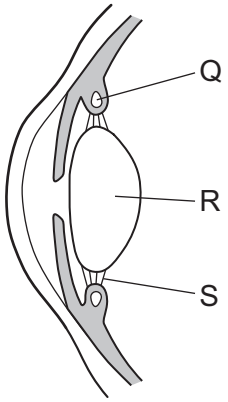
B kidney

C liver

D pancreas

24 The diagram shows a vertical section through part of a human eye. A fly is coming nearer to the eye. The eye begins to focus the image of the fly on the retina.





How do the labelled parts of the diagram change?

	Q	R	S
A	contracts	becomes thinner	becomes tighter
B	relaxes	becomes fatter	becomes slacker
C	contracts	becomes fatter	becomes slacker
D	relaxes	becomes thinner	becomes tighter

25 Which organ produces glucagon?

A adrenal gland

B liver

C ovary

D pancreas

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26 A young seedling is growing underground.

The shoot grows towards the surface of the ground.

The root grows away from the surface of the ground.

Which row describes the responses involved?

	gravitropism		phototropism	
	root	shoot	root	shoot
A	yes	yes	no	no
B	yes	no	no	yes
C	no	yes	yes	no
D	no	no	yes	yes

27 *Clostridium difficile* is a species of bacterium that is resistant to many antibiotics.

From 2002 to 2006, the number of people in one country infected with *Clostridium difficile* increased from 1300 to 6200 people.

What was the percentage increase in the number of people infected with *Clostridium difficile* from 2002 to 2006 to the nearest whole number?

A 21% **B** 27% **C** 79% **D** 377%

28 What are the characteristics of asexual reproduction?

	fusion of gamete nuclei	genetic variety in the offspring
A	yes	yes
B	yes	no
C	no	yes
D	no	no

29 Which description of cross-pollination is correct?

A the transfer of pollen grains from the anther of one plant to the stigma on a different plant

B the transfer of pollen grains from the anther to the stigma on the same plant

C the transfer of pollen grains from the stigma of one plant to the anther on a different plant

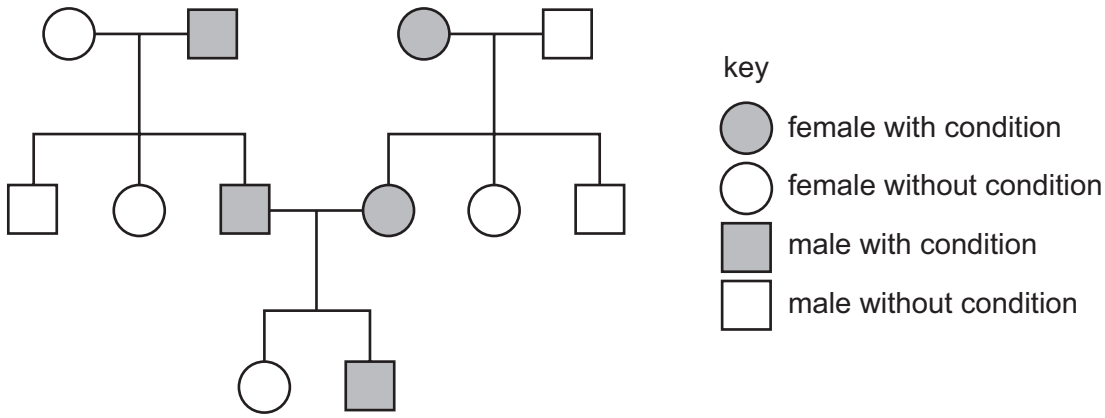
D the transfer of pollen grains from the stigma to the anther on the same plant

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30 Which row correctly links the named process with its description?

	process	description
A	menstruation	release of an egg
B	menstruation	shedding of the lining of the uterus
C	ovulation	fusion of nuclei
D	ovulation	start of puberty

31 The diagram shows the inheritance of a genetic condition in one family.



What can be concluded about this genetic condition?

A The alleles for the condition must be codominant.

B It is caused by a dominant allele.

C It is caused by recessive alleles.

D The alleles for the condition must be sex-linked.

32 What is a way in which new alleles are formed?

A artificial selection

B mutation

C natural selection

D sexual reproduction

33 How does artificial selection differ from natural selection?

A Artificial selection changes the characteristics of living things.

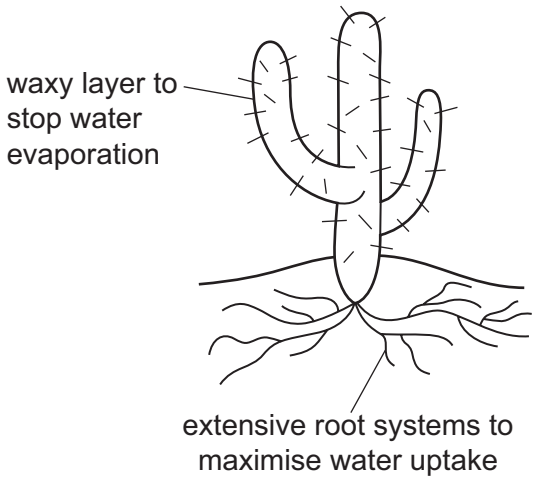
B Artificial selection is based on genetic variation.

C Artificial selection does **not** involve competition for resources.

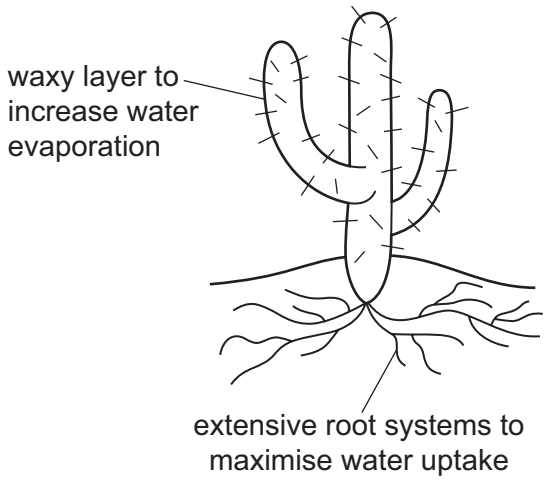
D Artificial selection occurs over many generations.

34 Which diagram of a xerophyte is labelled correctly?

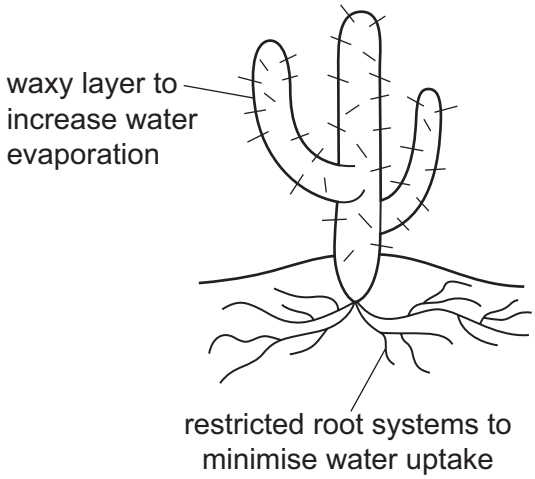
A



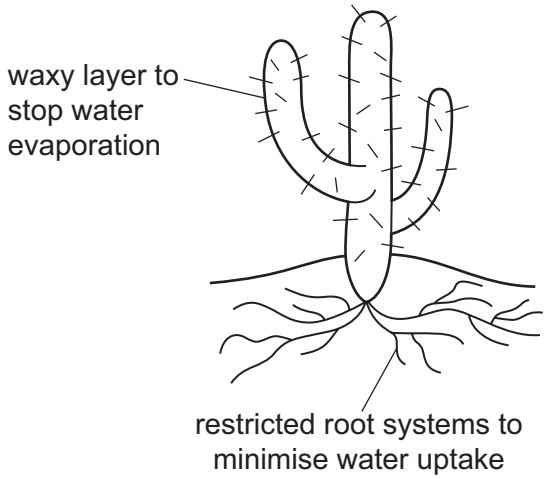
B



C



D



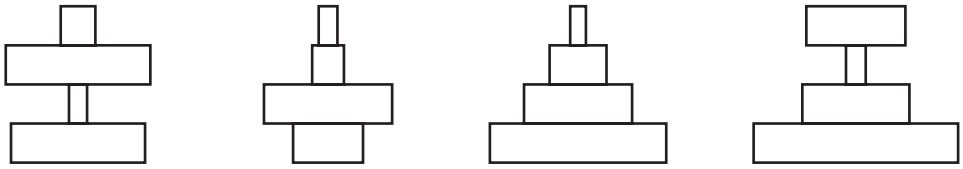
35 Which row describes the energy flow into and through a food chain that starts with a plant?

	energy entering a food chain	energy transferred between organisms in a food chain
A	chemical	chemical
B	chemical	heat
C	light	chemical
D	light	heat

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36 In a food chain, zebras are large mammals that eat grass. The zebras have many insects living on them which suck their blood. Birds eat the insects.

The diagrams show some biological pyramids.

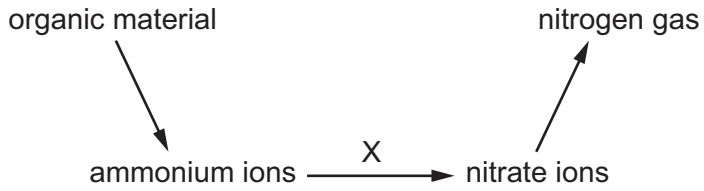


1 2 3 4

Which row identifies the types of pyramids for this food chain?

	pyramid of energy	pyramid of numbers
A	4	2
B	3	2
C	3	1
D	4	1

37 The diagram shows part of the nitrogen cycle.



What is the process labelled X in the diagram?

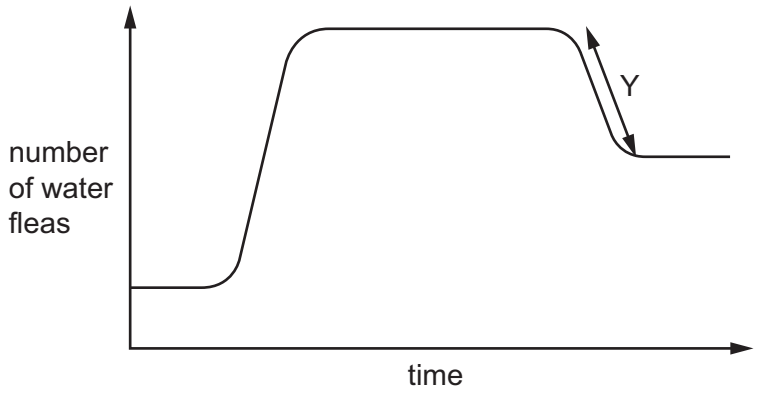
A decomposition

B denitrification

C nitrification

D nitrogen fixation

38 The graph shows the number of water fleas in a newly-created pond.



Which event could be responsible for the shape of the graph at Y?

A the addition of extra oxygenating plants to the pond

B an increase in the birth rate of the water fleas

C an increase in the food supply for the water fleas

D the addition of predators which feed on water fleas

39 When managing fish stocks as a **sustainable resource**, what is a reason for harvesting only the larger fish of a particular species?

A Larger fish are easier to harvest.

B Larger fish sell at a higher price.

C Smaller fish are eaten by predators.

D Smaller fish are too young to breed.

40 Which features make bacteria useful in biotechnology?

1 They are unaffected by antibiotics.

2 They do **not** contain plasmids.

3 They make complex molecules.

4 They reproduce rapidly.

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

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