Cambridge Assessment International Education

Cambridge IGCSE™

BIOLOGY **0610/22**

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

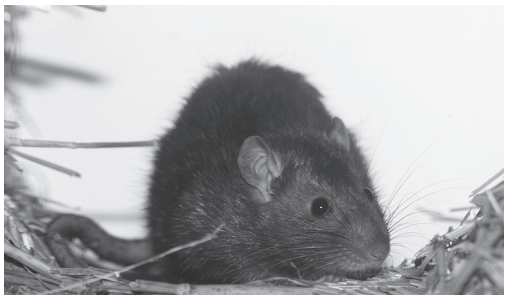
- The total mark for this paper is 40.
- Each correct answer will score one mark.
- Any rough working should be done on this question paper.

This document has **16** pages. Any blank pages are indicated.

1 The photographs show two different rats.

Rattus norvegicus

Rattus rattus



Which statement about the rats is correct?

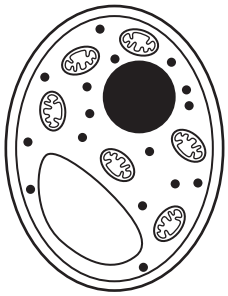
A The rats belong to the same genus.

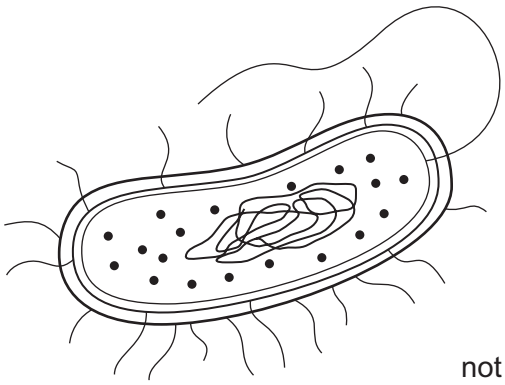
B The rats belong to the same species.

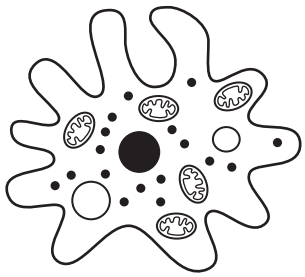
C The rats can breed together to produce fertile offspring.

D The rats do **not** share any of the same features.

2 The diagrams show cells of organisms from three different kingdoms.







not to scale

1 2 3

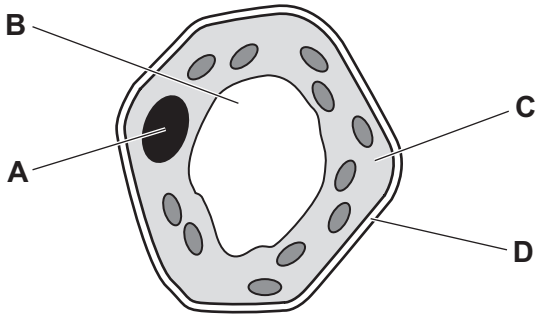
Which row shows the kingdoms for the organism cells labelled 1, 2 and 3?

	cell 1	cell 2	cell 3
A	fungus	protoctist	prokaryote
B	fungus	prokaryote	protoctist
C	prokaryote	fungus	protoctist
D	prokaryote	protoctist	fungus

3 The diagram shows a plant cell.

A biologist wants to find out the number of chromosomes it contains.

Which labelled part should be examined more closely?



4 Which term describes each structure?

	structure		
	brain	liver	neurone
A	organ	organ	cell
B	organ	tissue	cell
C	tissue	organ	tissue
D	tissue	cell	organ

5 The diagram shows the order of bases along part of one strand of DNA.

A—C—T—T—A—G—A—T

What is the order of bases on the complementary part of the other strand?

A A—C—T—T—A—G—A—T

B C—A—G—G—C—T—C—G

C T—A—G—A—T—T—C—A

D T—G—A—A—T—C—T—A

6 Which substance is an enzyme?

A fibrinogen

B mRNA

C pepsin

D saliva

[Turn over

7 Which function is performed in the duodenum?

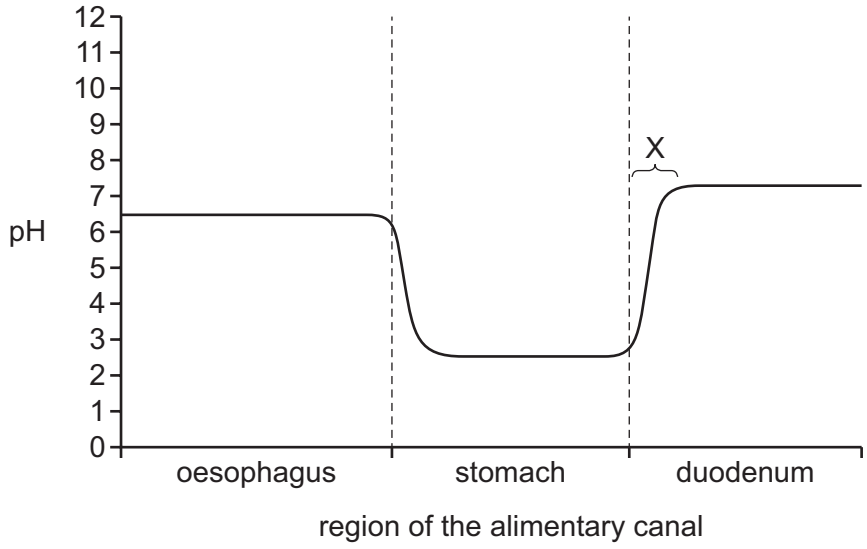
A assimilation

B digestion

C egestion

D ingestion

8 The graph shows the changes in pH in the oesophagus, stomach and duodenum.



Which substance causes the change in pH at the point labelled X?

A bile

B gastric juice

C glucagon

D trypsin

9 Which row names a small molecule and where that molecule is absorbed in the digestive system?

	name of the small molecule	small intestine	colon
A	amino acid	✗	✓
B	glucose	✗	✓
C	maltose	✓	✗
D	water	✓	✓

key

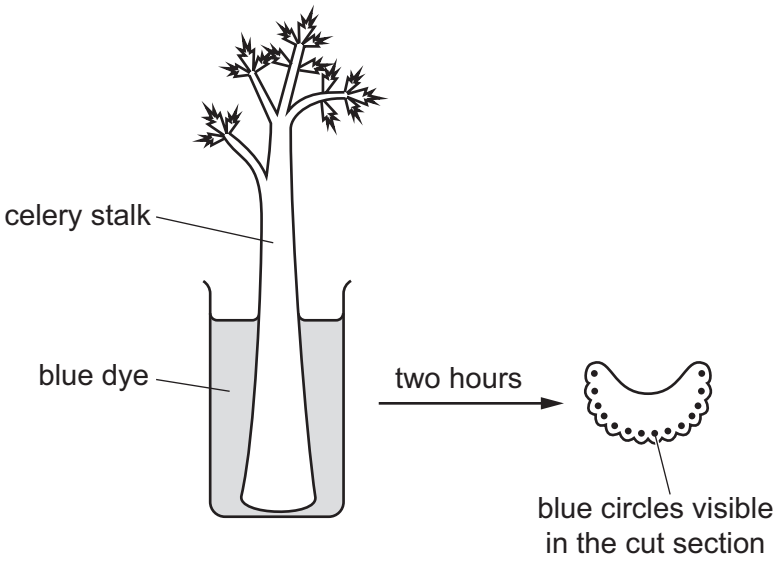
✓ = molecule is absorbed

✗ = molecule is **not** absorbed

10 A student cut one stalk of celery from a celery plant.

They put the celery stalk into a beaker of blue dye.

The celery stalk was removed from the blue dye after two hours and was cut into sections.



What is shown by the blue circles in the cut sections of celery stalk?

A position of the cortex cells

B position of the palisade cells

C position of the phloem cells

D position of the xylem vessels

11 Which process moves water from the surfaces of the mesophyll cells into the air spaces during transpiration?

A active transport

B circulation

C evaporation

D osmosis

12 The mass of water lost from a plant was investigated.

The leaves of the plant were covered with a type of grease that acts as a waterproof barrier.

The environmental conditions remained the same throughout the experiment.

The table shows the results of the investigation.

treatment	mass lost in seven days / g
no grease applied	12.0
grease applied only to the upper surface of every leaf	8.7
grease applied to both surfaces of every leaf	0.0

What is the mean daily rate of water loss through the upper surface of the leaves?

A 0.47 g / day **B** 1.24 g / day **C** 1.71 g / day **D** 3.30 g / day

13 What is translocation?

A the movement of amino acids and water from sink to source

B the movement of starch and water from source to sink

C the movement of sucrose and amino acids from source to sink

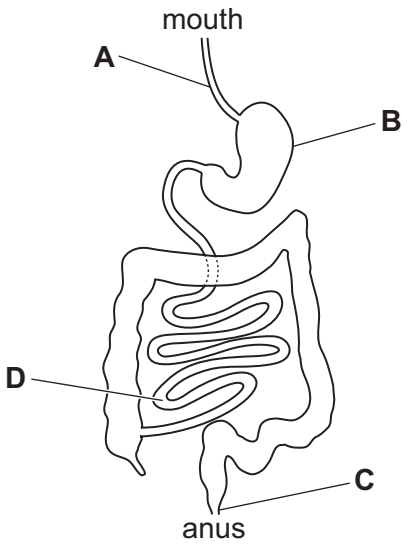
D the movement of sucrose and mineral ions from sink to source

14 Which row names the blood vessel containing the highest blood urea concentration and the blood vessel containing the lowest blood urea concentration?

	highest blood urea concentration	lowest blood urea concentration
A	hepatic artery	hepatic vein
B	hepatic vein	renal vein
C	hepatic portal vein	renal artery
D	renal vein	hepatic portal vein

15 The diagram shows the human digestive system.

Where do cholera bacteria cause the secretion of chloride ions?



16 Which row describes what happens when breathing in?

	diaphragm	external intercostal muscles
A	contracts	contract
B	contracts	relax
C	relaxes	contract
D	relaxes	relax

17 A person exercised vigorously for one minute and then rested for one hour.

Which statements about lactic acid are correct?

1 During exercise, lactic acid is produced in the muscles and diffuses into the blood.

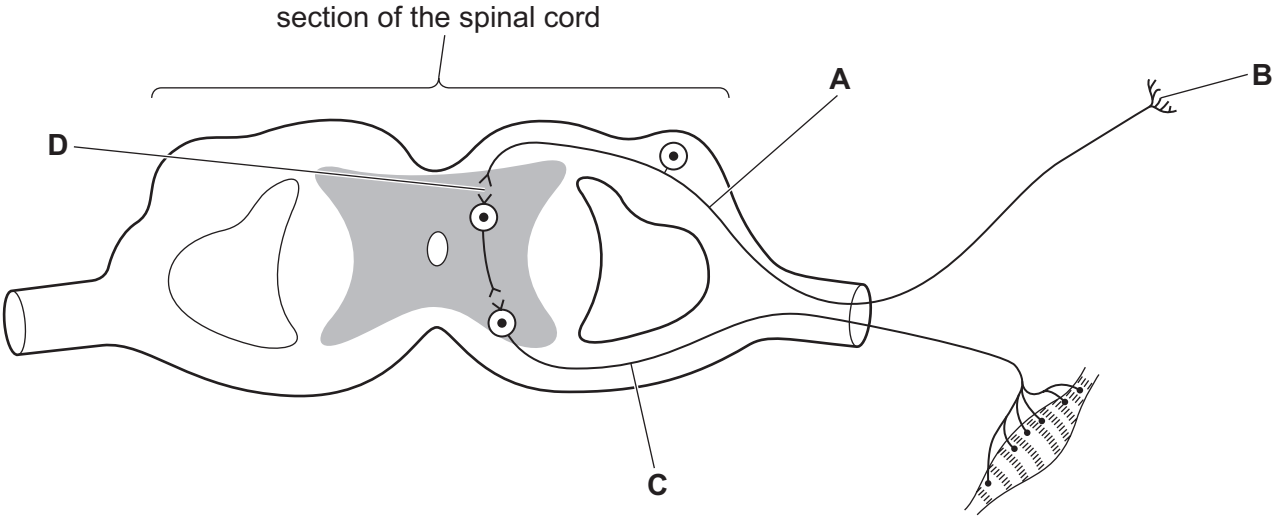
2 The blood transports lactic acid to the liver.

3 Lactic acid is broken down by anaerobic respiration.

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

18 The diagram shows the parts of the nervous system involved in a reflex arc.

Which letter identifies a synapse?



19 A person looks at a distant object in a dark area. The person then moves to a bright area and looks at a near object.

Which statement describes some of the changes that take place in the person's eyes?

A The circular muscles of the iris contract, the pupil constricts, the ciliary muscles relax and the lens gets thicker.

B The radial muscles of the iris relax, the circular muscles of the iris contract, the pupil constricts and the lens gets thinner.

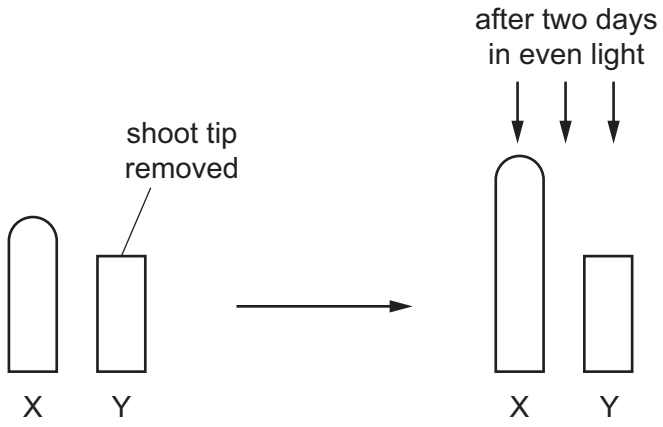
C The radial muscles of the iris relax, the pupil constricts, the ciliary muscles contract and the lens gets thicker.

D The radial muscles of the iris relax, the pupil dilates, the ciliary muscles relax and the lens gets thicker.

20 Which effect does adrenaline have on blood glucose concentration and pulse rate?

	blood glucose concentration	pulse rate
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

21 The diagram shows an experiment using two wheat shoot tips, X and Y.



Which statement is supported by the evidence provided by this experiment?

A Auxin moves through the plant by osmosis.

B Auxin is made in the shoot tip.

C Auxin is unequally distributed in response to light.

D Auxin inhibits cell elongation.

22 Which action would help to limit the development of antibiotic resistance in bacteria?

A Use antibiotics frequently to prevent infection by antibiotic-resistant bacteria.

B Use antibiotics only to treat bacterial infections.

C Use antibiotics to treat all types of infections.

D Use antibiotics to treat only viral infections.

23 What is an example of asexual reproduction?

A a single bacterium dividing to produce two genetically identical bacteria

B a mammal giving birth to four offspring

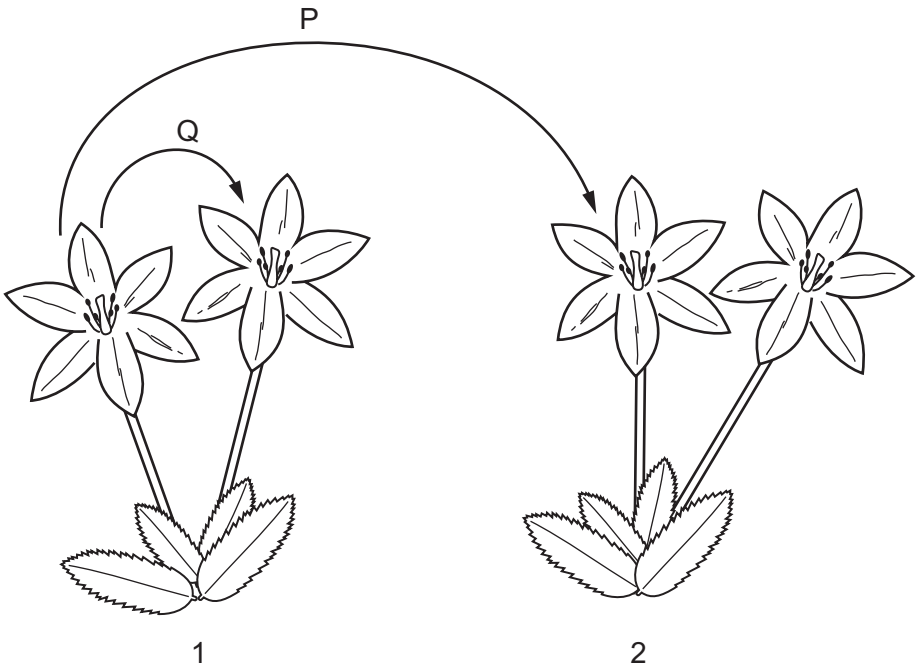
C a female bird laying six eggs which will hatch into the same species

D a tomato plant producing fruits which contain many seeds

[Turn over

24 The diagram shows parts of two different plants, 1 and 2, of the same species.

The transfer of pollen between the flowers of these two plants is shown by the arrows labelled P and Q.



Which arrows show cross-pollination, and which transfer of pollen would produce the most variation in the offspring?

	cross-pollination	transfer of pollen that produces the most variation in the offspring
A	P only	P
B	P only	Q
C	P and Q	P
D	P and Q	Q

25 Which substance is a hormone that is involved in the development and regulation of male secondary sexual characteristics?

A insulin

B glucagon

C lactase

D testosterone

26 Which statement describes the net direction of movement of a substance across the placenta?

A Carbon dioxide moves from the mother's blood to the fetus's blood.

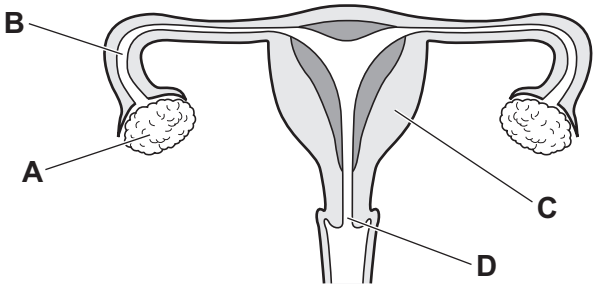
B Glucose moves from the fetus's blood to the mother's blood.

C Glycogen moves from the mother's blood to the fetus's blood.

D Urea moves from the fetus's blood to the mother's blood.

27 The diagram shows the human female reproductive system.

Which label identifies the uterus?



28 Which methods can transmit HIV?

1 hugging a person infected with HIV

2 sharing a needle with a person infected with HIV

3 using a plate that a person infected with HIV has used

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

29 Which chromosomes can be found in a single sperm?

A X and X **B** X and Y **C** X or X **D** X or Y

30 Why are lymphocytes the only cells that produce antibody proteins?

A Lymphocytes express all the genes in the nucleus.

B Lymphocytes have twice as many genes as other cells.

C Other cells do **not** have the genes for antibodies.

D The genes for antibodies are only expressed in lymphocytes.

31 During protein synthesis, what is the function of the ribosome?

A It assembles amino acids in a chain.

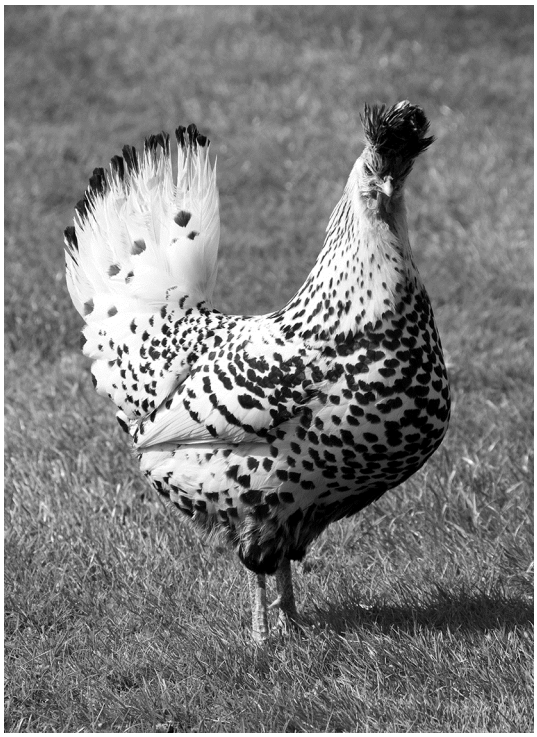
B It carries a copy of a gene to the cytoplasm.

C It contains the code for the synthesis of a protein.

D It determines the order of bases in the protein.

32 The photograph shows a speckled chicken.

Speckled chickens have white feathers and black feathers.



When a chicken with only white feathers and a chicken with only black feathers are crossed, all of the offspring are speckled.

What would be the expected phenotypic ratio if a speckled chicken was crossed with a chicken with only white feathers?

A all offspring have only white feathers

B all offspring are speckled

C 1 white feathers only : 1 speckled

D 3 white feathers only : 1 speckled

33 What are stem cells?

A specialised cells that divide by meiosis to produce daughter cells

B specialised cells that divide by mitosis to produce daughter cells

C unspecialised cells that divide by meiosis to produce daughter cells

D unspecialised cells that divide by mitosis to produce daughter cells

34 What are features of hydrophytes which have leaves that float?

A long root system

B many stomata on upper surface of leaves

C hairy leaves

D small air spaces in the spongy mesophyll

35 Which unit could be used for the measurements needed to construct a pyramid of energy?

A kJ per g per m^2

B kJ per kg per year

C kJ per m^2 per year

D kJ per kg

36 Which process needs microorganisms to break down protein to produce ammonium ions?

A decomposition

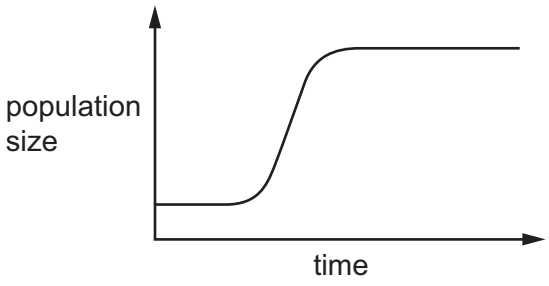
B denitrification

C nitrification

D nitrogen fixation

[Turn over

37 The graph shows part of a growth curve for a bacterial population.



What is **not** shown in the graph?

A the death phase

B the exponential phase

C the lag phase

D the stationary phase

38 What is an **advantage** of large scale monocultures?

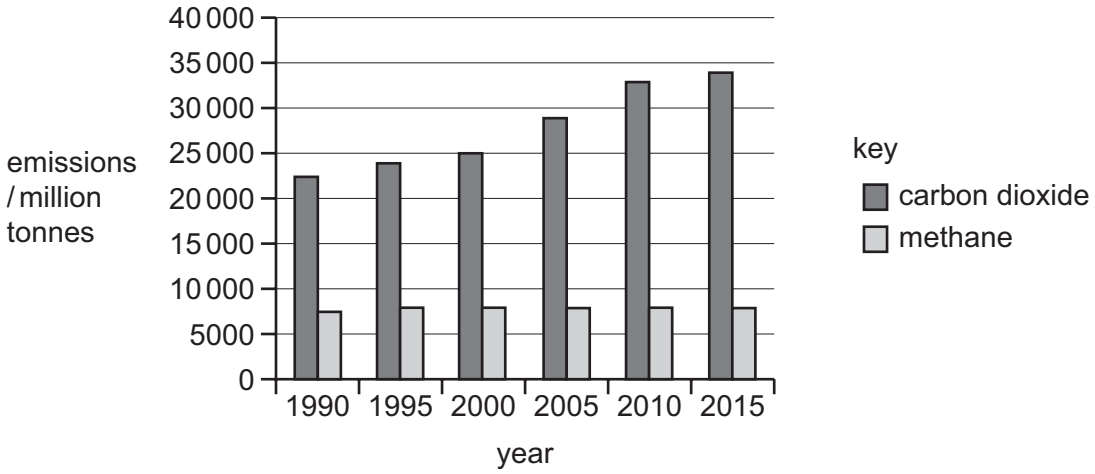
A increased biodiversity

B increased crop yield

C increased susceptibility to disease

D increased variation in the crop plant

39 The graph shows the global emissions of carbon dioxide and methane from 1990 to 2015.



A student makes four statements about carbon dioxide and methane.

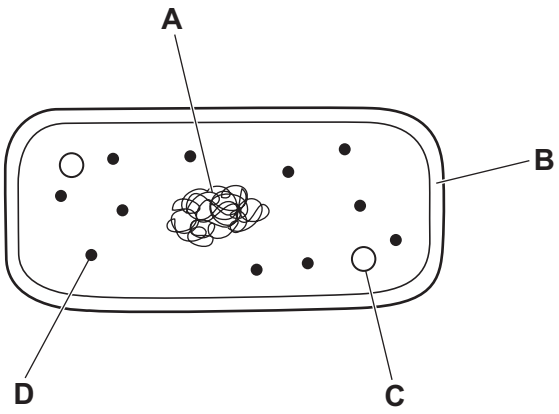
- Carbon dioxide and methane were the only sources of greenhouse gases produced in 1990.
- Carbon dioxide emissions continue to rise to the present day.
- Carbon dioxide has a greater effect on climate change than methane.
- Methane emissions were lower than carbon dioxide emissions between 1990 and 2015.

How many statements are supported by these data?

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

40 The diagram shows a bacterium.

Which structure is cut to form sticky ends during genetic modification?



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