Cambridge Assessment International Education

# Cambridge IGCSE™

**BIOLOGY** **0610/12**

Paper 1 Multiple Choice (Core) **October/November 2023**

**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.


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**1** Which processes are characteristics of **all** living organisms?

1 digestion

2 respiration

3 excretion

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

**2** Using the binomial system, the Arctic fox is called *Vulpes lagopus*.

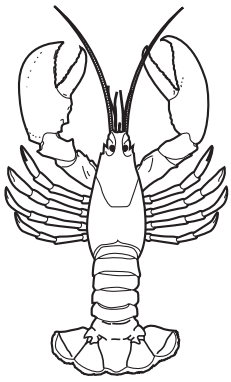
Which row is correct?

| | *Vulpes* | *lagopus* |
|---|---|---|
| **A** | genus | kingdom |
| **B** | genus | species |
| **C** | species | genus |
| **D** | species | kingdom |

**3** The diagrams show four different types of arthropod.

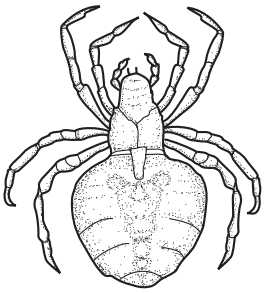
Which organism is labelled with its correct arthropod group?

**A**



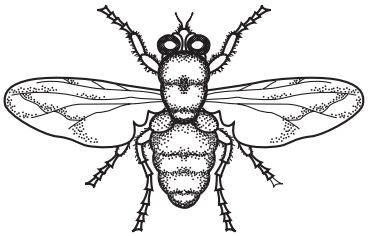
crustacean

**B**



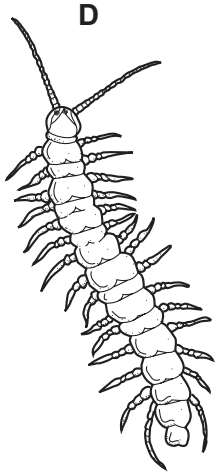
insect

**C**



myriapod

**D**



arachnid

**4** Which features are possessed by **all** plant cells?

| | a cell wall | chloroplasts |
|---|---|---|
| **A** | ✓ | ✓ |
| **B** | ✓ | ✗ |
| **C** | ✗ | ✓ |
| **D** | ✗ | ✗ |

key

✓ = yes

✗ = no

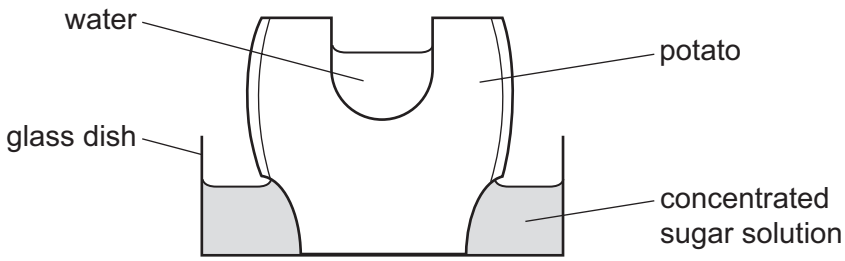
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**5** The diameter of an egg is 6.5 cm. A student draws the egg. The diameter of the egg in the drawing is 19.5 cm.

What is the magnification of the drawing?

**A** ×0.3 **B** ×3.0 **C** ×6.5 **D** ×300

**6** The diagram shows an experiment to investigate osmosis in living cells.




What happens to the volumes of water and sugar solution after 12 hours?

| | volume of water | volume of sugar solution |
|---|---|---|
| **A** | decreases | increases |
| **B** | increases | increases |
| **C** | increases | remains the same |
| **D** | remains the same | decreases |

**7** Which process causes oxygen to pass from an alveolus in the lung into a blood capillary?

**A** assimilation

**B** diffusion

**C** excretion

**D** osmosis

**8** Which row identifies the chemical elements in proteins?

| | carbon | hydrogen | oxygen | nitrogen |
|---|---|---|---|---|
| **A** | ✓ | ✓ | ✓ | ✓ |
| **B** | ✓ | ✗ | ✓ | ✗ |
| **C** | ✗ | ✓ | ✓ | ✓ |
| **D** | ✓ | ✓ | ✗ | ✗ |

key

✓ = present

✗ = absent

**9** The table shows some large biological molecules and some small biological molecules.

| | large biological molecules | small biological molecules |
|---|---|---|
| 1 | cellulose | glucose |
| 2 | oil | amino acids |
| 3 | glycogen | glucose |
| 4 | protein | ethanol |

Which rows correctly pair large molecules with the smaller molecules used to make them?

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

**10** Which changes could cause an enzyme to denature?

1 change in pH

2 change in temperature

3 change in substrate concentration

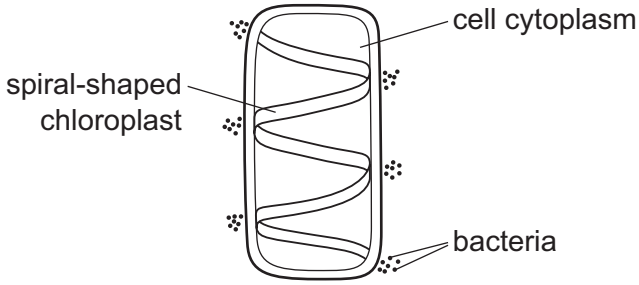
**A** 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

**11** Which features of a leaf allow more diffusion of carbon dioxide into the palisade cells for photosynthesis?

| | number of stomata | thickness of the leaf |
|---|---|---|
| **A** | few | thick |
| **B** | few | thin |
| **C** | many | thick |
| **D** | many | thin |

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**12** The diagram shows a cell with groups of bacteria around its edge.




The bacteria have moved to areas of high oxygen concentration.

Which process in the cell causes the bacteria to form these groups?

**A** digestion

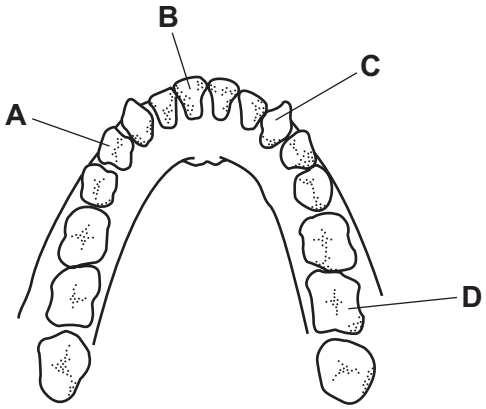
**B** photosynthesis

**C** reproduction

**D** respiration

**13** The diagram shows the teeth in the lower jaw of a human.

Which tooth is a premolar?




**14** Some medicines are made into tablets which are coated in a starch-like substance.

The coating protects the medicine from the effects of gastric juice.

Which enzyme digests the coating and what is produced by this action?

| | enzyme | products |
|---|---|---|
| **A** | amylase | fatty acids and glycerol |
| **B** | amylase | simple reducing sugars |
| **C** | lipase | fatty acids and glycerol |
| **D** | lipase | simple reducing sugars |

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**15** In which part of the alimentary canal are **most** nutrients absorbed into the blood?

**A** colon

**B** oesophagus

**C** small intestine

**D** stomach

**16** From which part of a leaf does **most** water evaporate during transpiration?

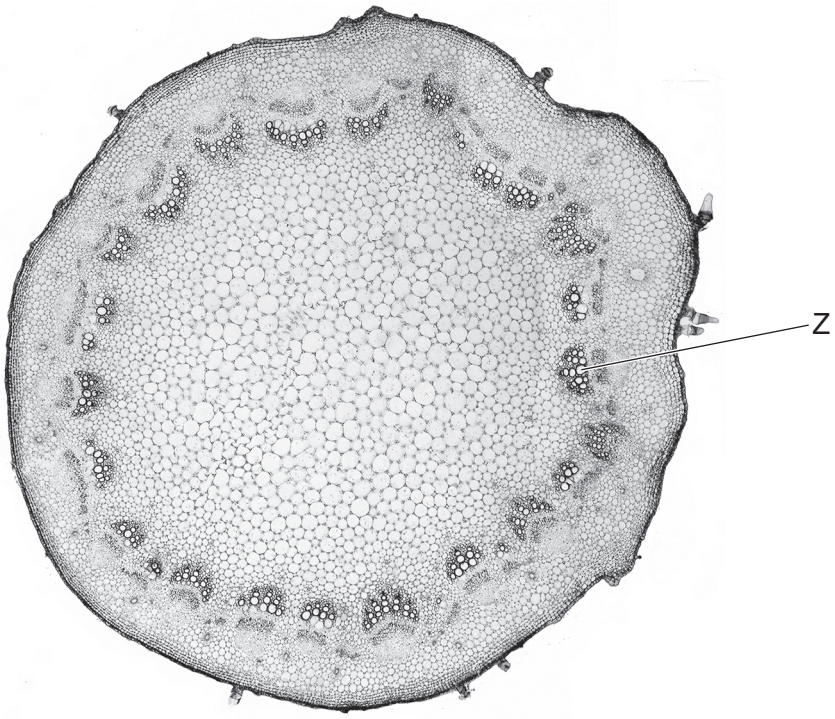
**A** the cuticle

**B** the guard cells

**C** the spongy mesophyll cells

**D** the xylem vessels

**17** The photograph shows a cross-section through a sunflower stem.




What is the name and function of the tissue labelled Z?

| | name of tissue | function of tissue |
|---|---|---|
| **A** | phloem | transport of mineral ions |
| **B** | phloem | transport of sucrose |
| **C** | xylem | transport of mineral ions |
| **D** | xylem | transport of sucrose |

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**18** What ensures the one-way flow of blood in the human circulatory system?

**A** capillaries

**B** muscles

**C** valves

**D** ventricles

**19** In which row is the component of blood correctly linked to its function?

| | blood component | function |
|---|---|---|
| **A** | plasma | transport of carbon dioxide |
| **B** | platelets | phagocytosis |
| **C** | red blood cells | antibody production |
| **D** | white blood cells | blood clotting |

**20** Which statement describes a transmissible disease?

**A** a disease caused when a pathogen passes from one host to another

**B** a disease caused when a pathogen passes through a host's body

**C** a disease caused when a pathogen passes to the host's body only by direct contact

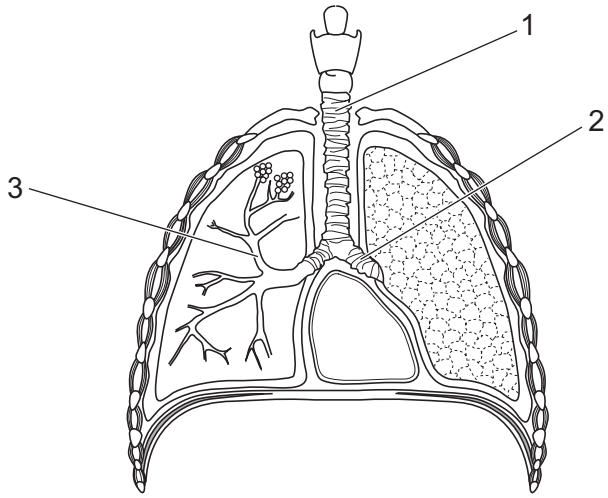
**D** a disease caused when a pathogen passes to the host's body only by indirect contact

**21** What is the composition of expired air compared with inspired air?

| | carbon dioxide | oxygen | water vapour |
|---|---|---|---|
| **A** | decreased | increased | increased |
| **B** | decreased | decreased | increased |
| **C** | increased | decreased | decreased |
| **D** | increased | decreased | increased |

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**22** The diagram shows the human breathing system.




What are the labelled structures?

| | 1 | 2 | 3 |
|---|---|---|---|
| **A** | bronchus | bronchiole | trachea |
| **B** | bronchiole | bronchus | trachea |
| **C** | trachea | bronchus | bronchiole |
| **D** | trachea | diaphragm | bronchus |

**23** Yeast cells can convert glucose into alcohol and carbon dioxide.

Which statement about this process is correct?

**A** The alcohol produced can be used to make bread rise.

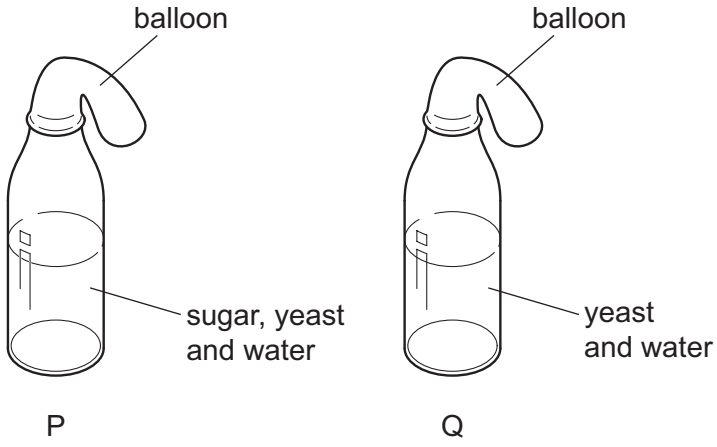
**B** The carbon dioxide produced can be burnt as a biofuel.

**C** The yeast cells are using oxygen for this process.

**D** The yeast cells are carrying out anaerobic respiration.

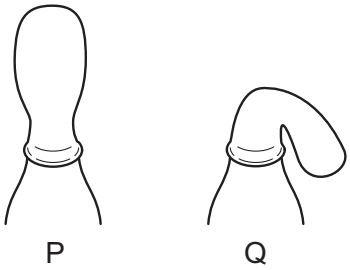
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**24** In an experiment to investigate anaerobic respiration, two bottles are set up in a warm room, as shown.

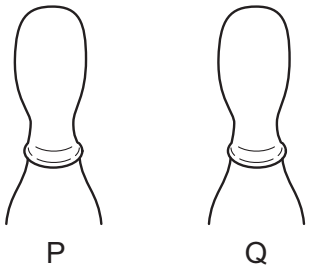



What would happen to each balloon after one day?

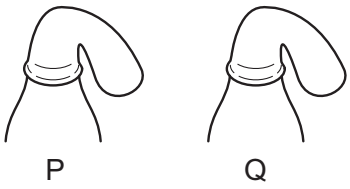
**A**



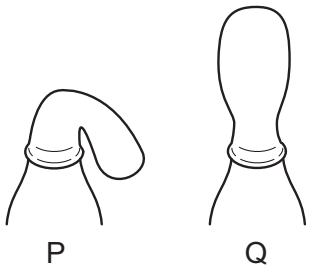

**B**




**C**




**D**

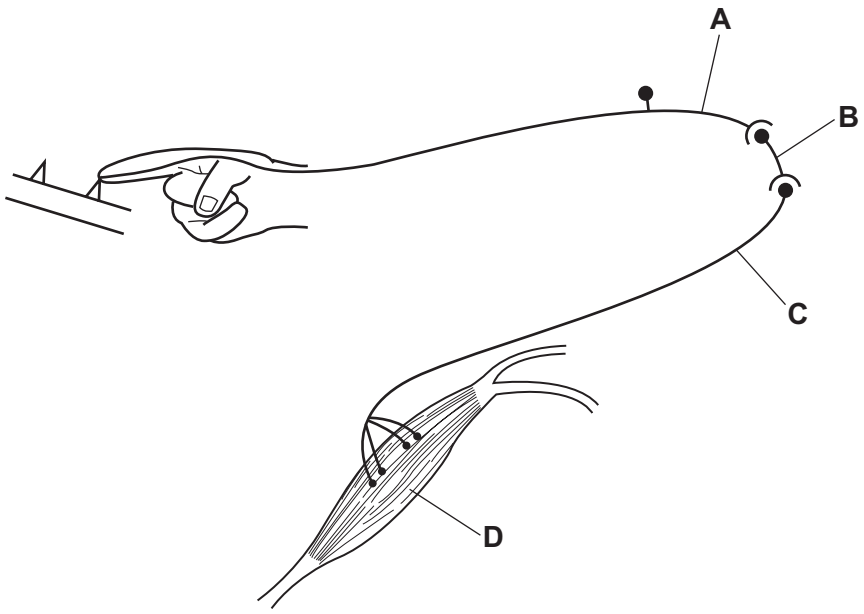



**25** Which row shows an organ and the substance it excretes?

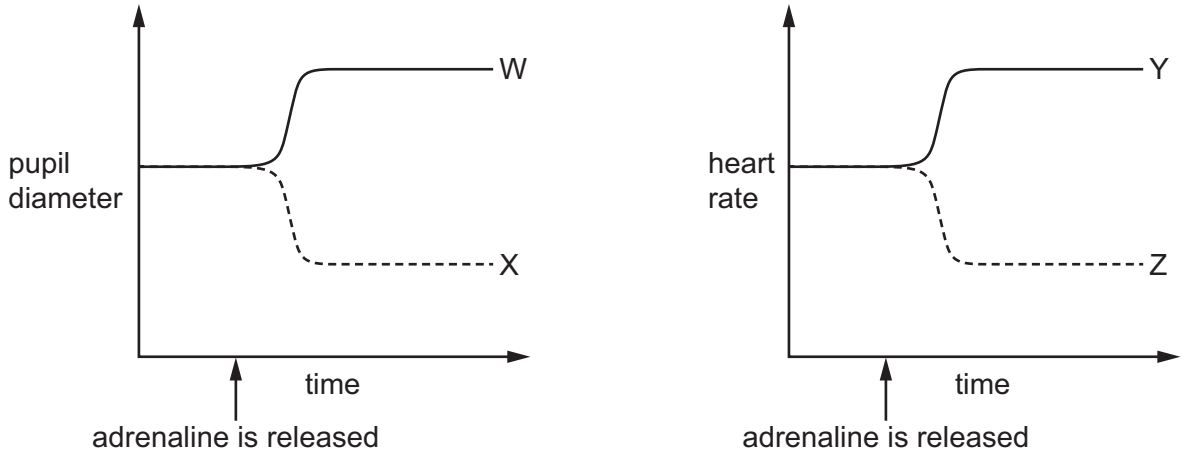
| | organ | substance excreted |
|---|---|---|
| **A** | bladder | water |
| **B** | kidney | ions |
| **C** | lung | oxygen |
| **D** | urethra | urea |

**26** The diagram shows a reflex arc in a human nervous system. The person's finger has just made contact with a sharp object.

Which part is the motor neurone?




**27** Which lines on the graphs show the effects of adrenaline on pupil diameter and heart rate?




**A** W and Y **B** W and Z **C** X and Y **D** X and Z

**28** Which statements about tropisms in plants are correct?

1 Shoots grow towards light and away from gravity.

2 Shoots grow away from light and towards gravity.

3 Roots grow towards light and away from gravity.

4 Roots grow away from light and towards gravity.

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

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**29** What is defined as a substance that is taken into the body and modifies or affects chemical reactions in the body?

**A** antibody

**B** drug

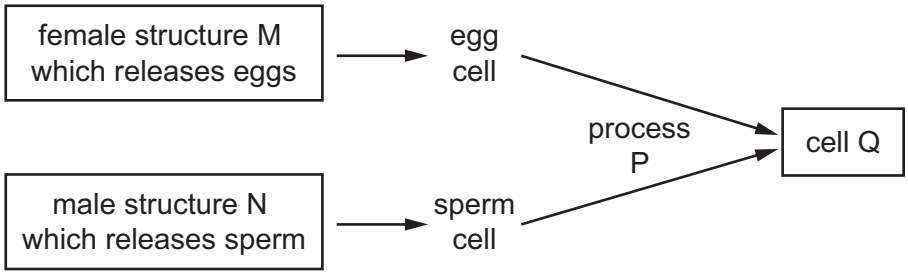
**C** hormone

**D** pathogen

**30** Which row is correct for asexual reproduction?

| | number of parents | offspring compared with parent or parents |
|---|---|---|
| **A** | one | genetically different |
| **B** | one | genetically identical |
| **C** | two | genetically different |
| **D** | two | genetically identical |

**31** The diagram shows some stages in reproduction.




Which letter correctly identifies the structure or process?

**A** M is the oviduct.

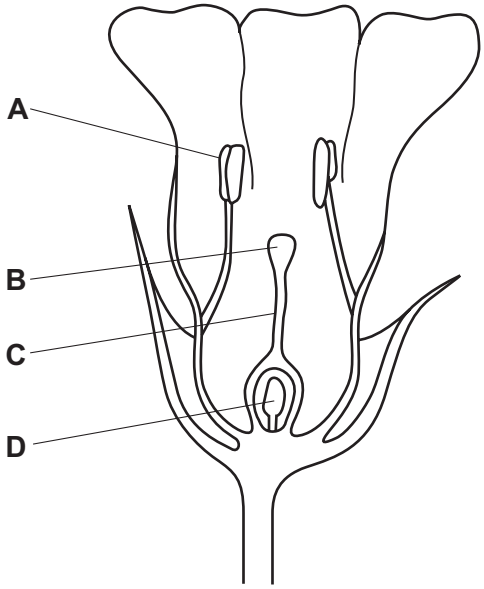
**B** N is the sperm duct.

**C** P is fertilisation.

**D** Q is the gamete.

**32** The diagram shows half a flower.

Which structure produces pollen?




**33** Two parents have the genotypes Bb and bb for a particular feature.

What is the probability of these parents having offspring that are homozygous recessive for this feature?

**A** 100% **B** 75% **C** 50% **D** 25%

**34** A genetic cross between two organisms may be shown as Tt × Tt.

What does T represent?

**A** a dominant allele

**B** a dominant chromosome

**C** a recessive allele

**D** a recessive chromosome

**35** Some phenotypes are listed.

1 blood group

2 body mass

3 height

4 seed colour in peas

Which phenotypes are examples of continuous variation?

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

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**36** A food chain is shown.

lettuce plant → slug → hedgehog

By which process is energy transferred from the lettuce plant to the slug?

**A** egestion

**B** excretion

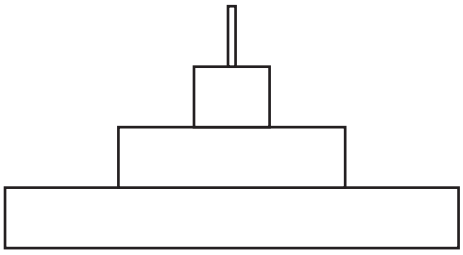
**C** ingestion

**D** respiration

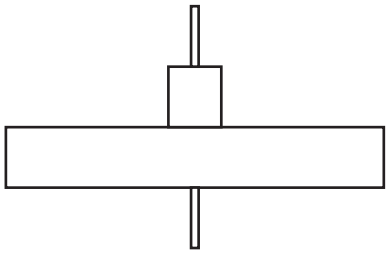
**37** A single bush is food for a large population of greenfly. Several ladybirds eat the greenfly. The ladybirds are eaten by a bird.

Which diagram shows the pyramid of numbers for this food chain?

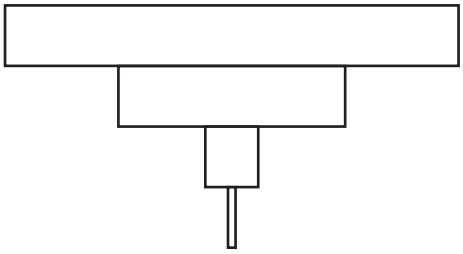
**A**



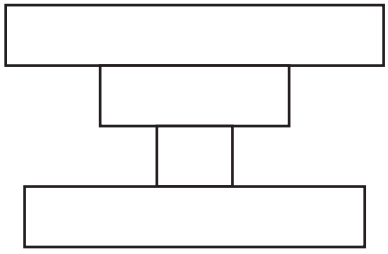
**B**



**C**

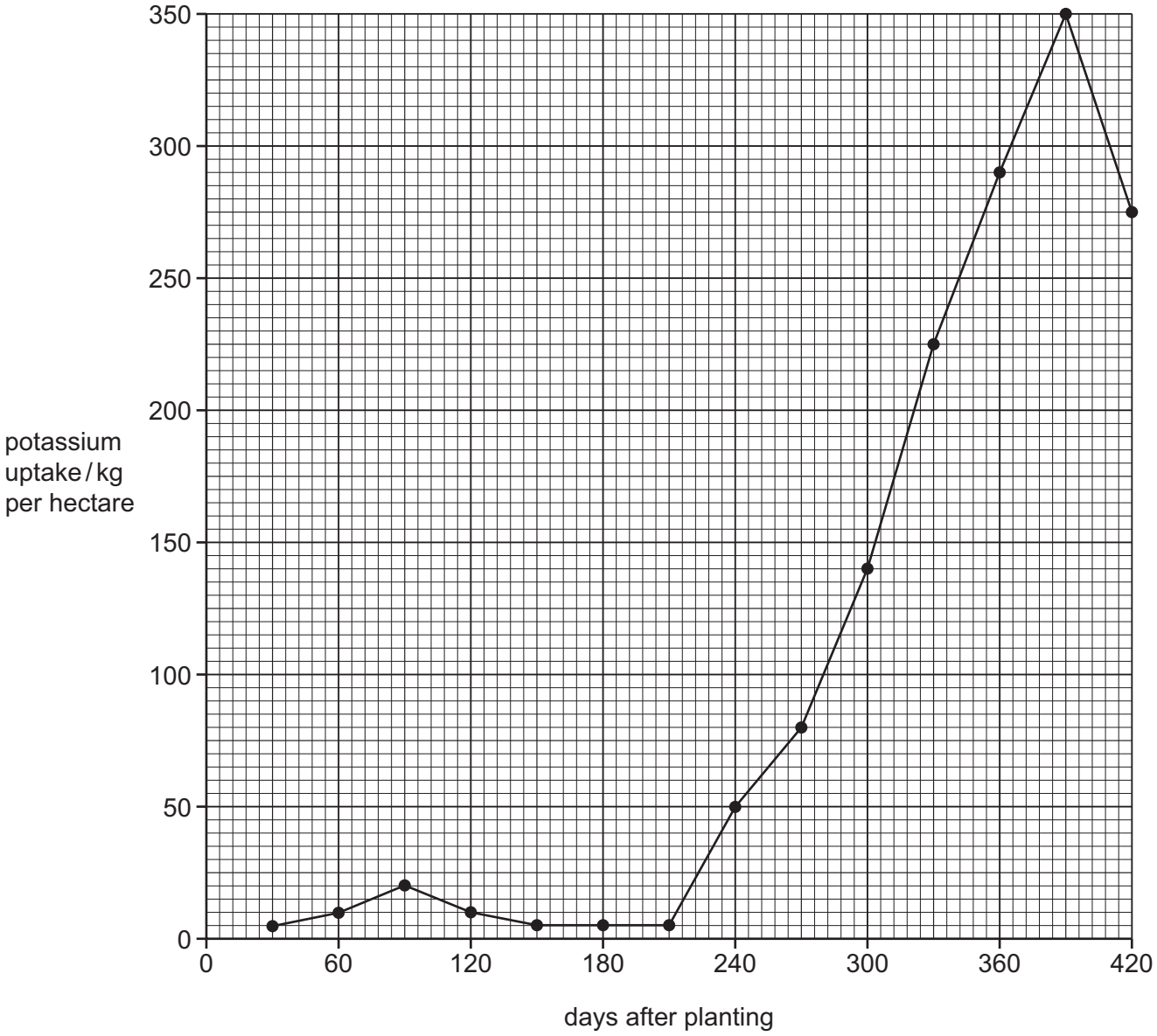


**D**



**38** Scientists studied the uptake of potassium ions from chemical fertilisers by wheat plants.

The results are shown.




What is the difference in the uptake of potassium ions at 360 days after planting compared to 30 days after planting?

**A** 295 kg per hectare

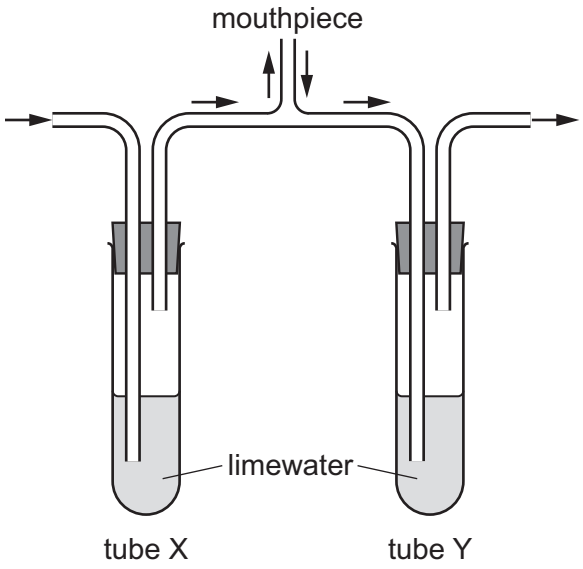
**B** 290 kg per hectare

**C** 285 kg per hectare

**D** 280 kg per hectare

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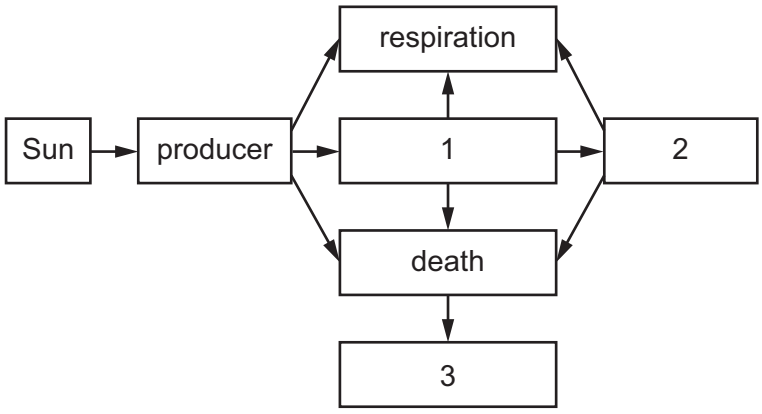
**39** A student investigated gas exchange using the apparatus shown.




What would be the appearance of the limewater in tube X and tube Y after breathing in and out of the mouthpiece for one minute?

| | tube X | tube Y |
|---|---|---|
| **A** | clear | clear |
| **B** | clear | cloudy |
| **C** | cloudy | clear |
| **D** | cloudy | cloudy |

**40** The diagram shows the flow of energy in an ecosystem.




Which row correctly completes boxes 1, 2 and 3?

| | 1 | 2 | 3 |
|---|---|---|---|
| **A** | herbivore | carnivore | decomposer |
| **B** | carnivore | herbivore | decomposer |
| **C** | decomposer | carnivore | herbivore |
| **D** | carnivore | decomposer | herbivore |

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