5090 Biology Paper 1 - Cells

Topical questions | 22 questions

1. Question | 5090 May-June 2023 P1 V1 Q1

1 Which description applies to a red blood cell?

	cell wall	nucleus
A	absent	absent
B	absent	present
C	present	absent
D	present	present

2. Question | 5090 Oct-Nov 2023 P1 V1 Q1

1 What are characteristics of bacteria?

	contain cytoplasm	have DNA	nuclear membrane present
A	✗	✓	✗
B	✓	✓	✗
C	✓	✗	✓
D	✗	✓	✓

key

✓ = yes

✗ = no

3. Question | 5090 Oct-Nov 2023 P1 V2 Q1

1 Which structures have both cytoplasm and cell walls?

A liver cells

B red blood cells

C root hair cells

D xylem vessels

4. Question | 5090 Specimen 2023 P1 Q1

1 Which structures are found in animal cells **and** in plant cells?

1 mitochondria

2 cell wall

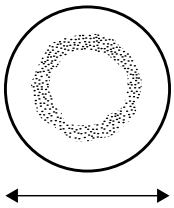
3 ribosomes

4 sap vacuole

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

5. Question | 5090 Specimen 2023 P1 Q2

2 A student draws a red blood cell. The drawing is 20 mm in diameter.



20 mm

This red blood cell is actually 0.008 mm in diameter.

What is the magnification of the cell shown in the drawing?

A ×40

B ×250

C ×2500

D ×40 000

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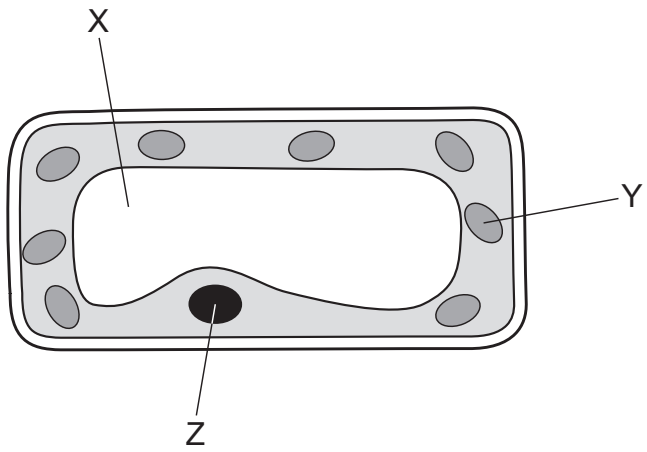
6. Question | 5090 May-June 2024 P1 V1 Q1

1 The diagram shows some of the structures in a plant cell.



Which labelled parts show a sap vacuole, a nucleus and a chloroplast?

	sap vacuole	nucleus	chloroplast
A	X	Y	Z
B	X	Z	Y
C	Y	Z	X
D	Z	Y	X

7. Question | 5090 May-June 2024 P1 V2 Q1

1 Which type of cell has a cellulose cell wall?

A animal

B bacterium

C fungus

D plant

8. Question | 5090 Oct-Nov 2024 P1 V1 Q1

1 Which structures are present in plant cells but **not** in animal cells?

A cell membrane, cytoplasm, chloroplasts

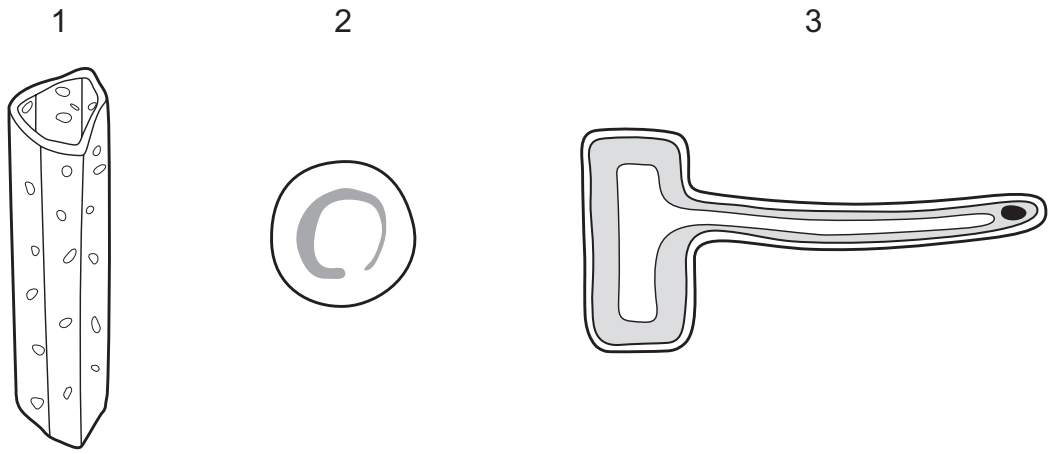
B cellulose cell wall, chloroplasts, sap vacuole

C cellulose cell wall, cell membrane, cytoplasm

D cytoplasm, nucleus, chloroplasts

9. Question | 5090 Oct-Nov 2024 P1 V2 Q1

1 The diagram shows three different types of microscopic structure.

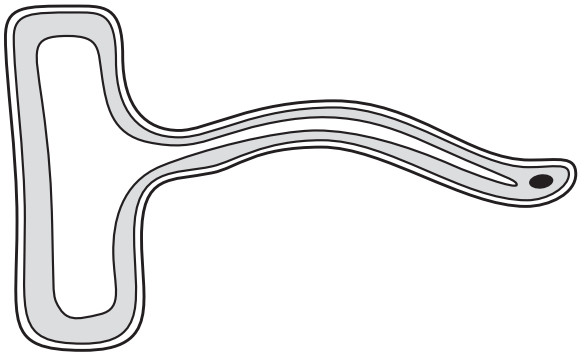


What are these structures?

	1	2	3
A	xylem vessel	root hair cell	red blood cell
B	red blood cell	xylem vessel	root hair cell
C	root hair cell	red blood cell	xylem vessel
D	xylem vessel	red blood cell	root hair cell

10. Question | 5090 May-June 2025 P1 V1 Q1

1 The diagram shows a plant cell.



What is the function of this cell?

A to carry mineral ions along stems

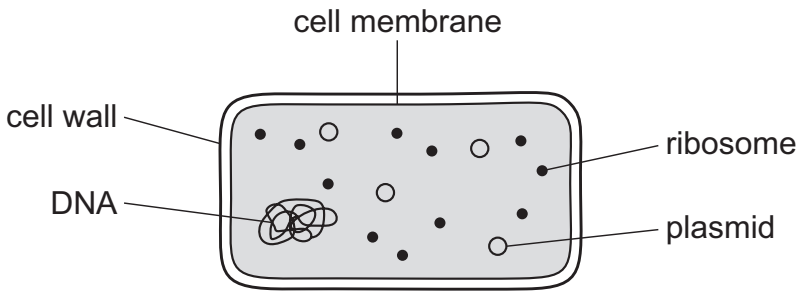
B to photosynthesise

C to take in carbon dioxide

D to take in water

11. Question | 5090 May-June 2025 P1 V1 Q2

2 The diagram shows a structure that was observed using a microscope.



What does the diagram show?

A an animal cell

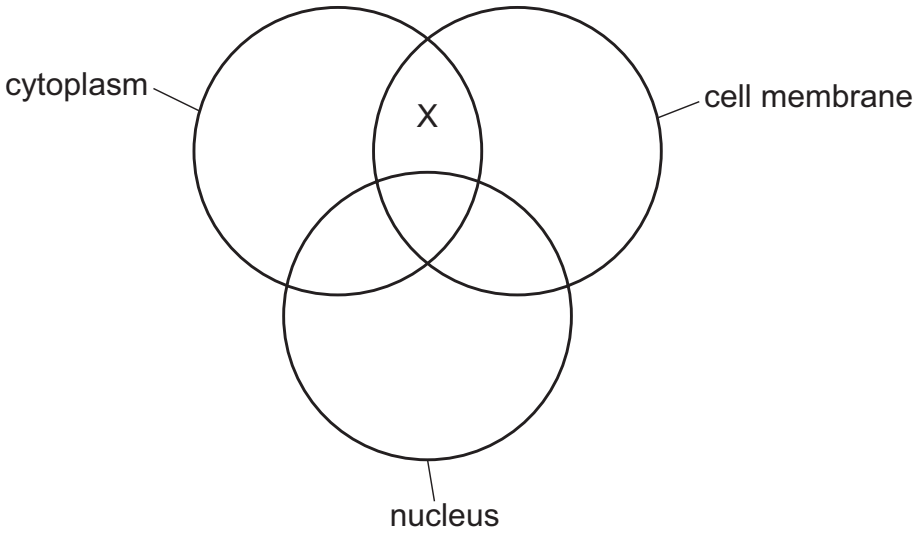
B a bacterium

C a plant cell

D a virus

12. Question | 5090 May-June 2025 P1 V1 Q3

3 The diagram shows the structures found in cell X.



Which type of cell is X?

A liver cell

B red blood cell

C root hair cell

D xylem vessel

13. Question | 5090 May-June 2025 P1 V1 Q4

4 What is an example of an organ?

A digestive system

B eye

C blood

D neurone

14. Question | 5090 May-June 2025 P1 V2 Q1

1 A student observes a human egg cell through a light microscope.

The cell is 0.12 mm in diameter.

The student draws a diagram of this egg cell.

The diagram has a diameter of 4.2 cm.

What is the magnification of the drawing to the nearest whole number?

A ×5 **B** ×35 **C** ×50 **D** ×350

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15. Question | 5090 May-June 2025 P1 V2 Q2

2 Which row correctly identifies a cell, a tissue, an organ and an organ system?

	cell	tissue	organ	organ system
A	chloroplast	mesophyll	liver	digestive
B	sap vacuole	red blood cell	blood	nervous
C	red blood cell	sap vacuole	stomach	liver
D	neurone	muscle	leaf	urinary

16. Question | 5090 Oct-Nov 2025 P1 V1 Q1

1 What is a function of a plant cell wall?

A to control loss of ions from the cell

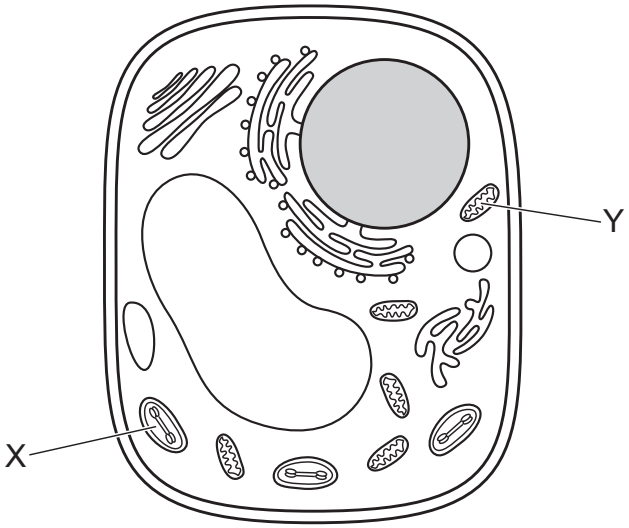
B to control movement of glucose into the cell

C to prevent evaporation of water from the cell

D to prevent the cell bursting when water enters

17. Question | 5090 Oct-Nov 2025 P1 V2 Q1

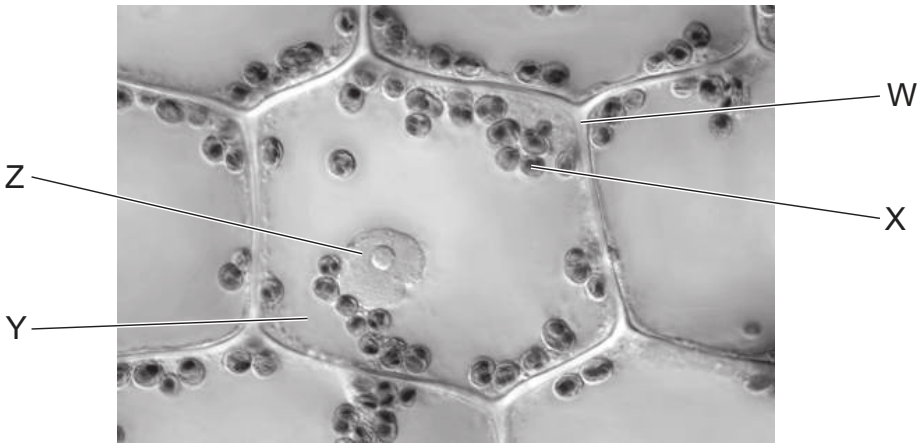
1 Which row identifies structures X and Y on the plant cell diagram?



	structure X	structure Y
A	chloroplast	mitochondrion
B	chloroplast	ribosome
C	nucleus	chloroplast
D	mitochondrion	ribosome

18. Question | 5090 May-June 2026 P1 V1 Q1

1 The photomicrograph shows *Elodea* cells.



Which row identifies the cell wall, a chloroplast, the cytoplasm and the nucleus?

	cell wall	chloroplast	cytoplasm	nucleus
A	W	X	Y	Z
B	W	Z	Y	X
C	Y	X	W	Z
D	Y	W	Z	X

19. Question | 5090 May-June 2026 P1 V1 Q2

2 Human liver cells contain, on average, 1500 mitochondria per cell. The volume of a typical liver cell is 11 305 μm^3 and mitochondria occupy 20% of this volume.

What is the average volume of a single liver cell mitochondrion?

A 0.15 μm^3 **B** 1.5 μm^3 **C** 15.0 μm^3 **D** 150 μm^3

20. Question | 5090 May-June 2026 P1 V1 Q8

8 What is an example of an organ?

A alveolus

B sperm

C neurone

D kidney

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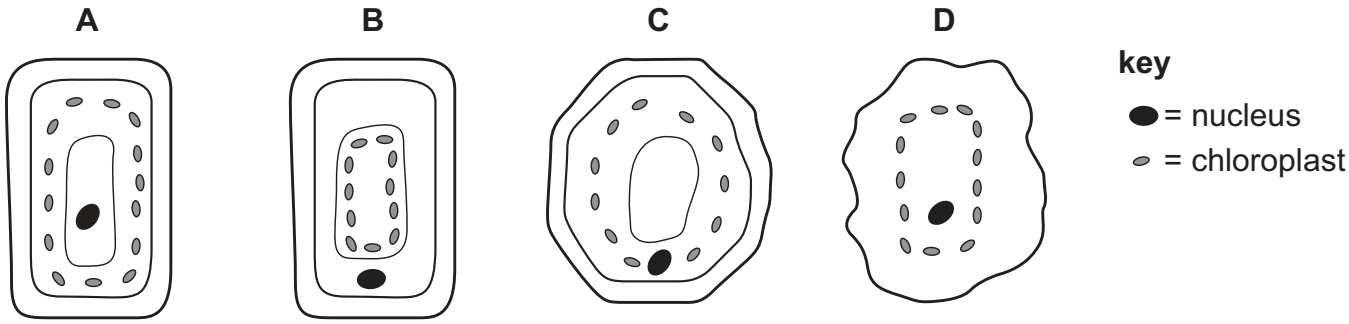
21. Question | 5090 May-June 2026 P1 V2 Q1

1 Which diagram shows the positions of the chloroplasts and the nucleus in a cell?



22. Question | 5090 May-June 2026 P1 V2 Q2

2 What is the formula used to calculate the actual size of an object from an image of that object?

A actual size = magnification × image size

B actual size = magnification + image size

C $\text{actual size} = \frac{\text{magnification}}{\text{image size}}$

D $\text{actual size} = \frac{\text{image size}}{\text{magnification}}$