

1.1 Cells: Theory

Question Paper

Course	DP IB Biology
Section	1. Cell Biology
Topic	1.1 Cells: Theory
Difficulty	Medium

Time allowed: 20
Score: /10
Percentage: /100

Question 1

A prokaryotic cell has a diameter of $1\ \mu\text{m}$. The cell is magnified 50 000 times by an electron microscope.

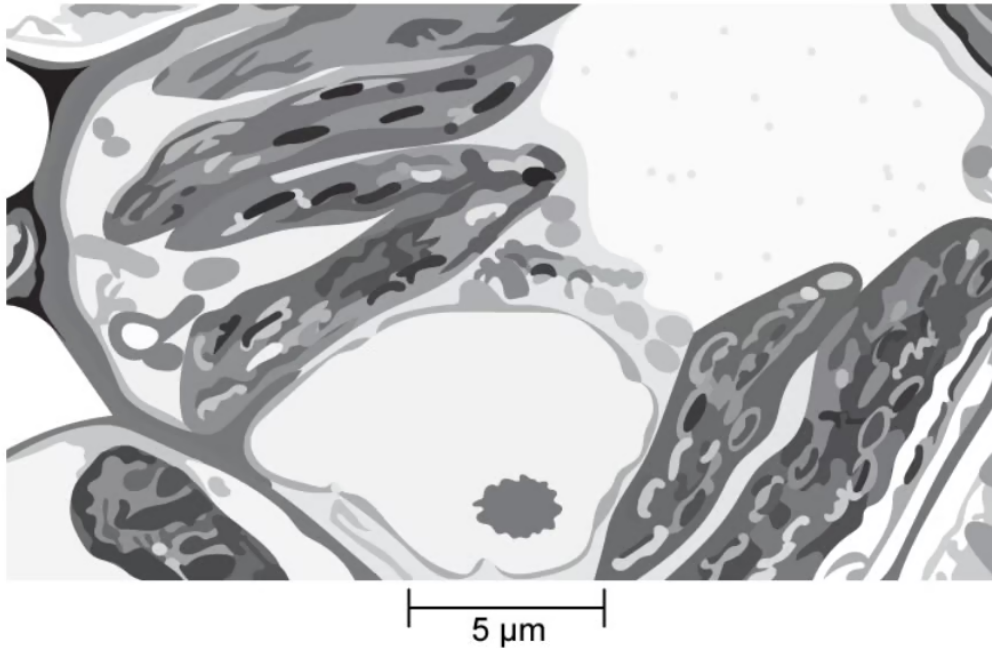
In the electron micrograph that is produced by the electron microscope, what is the diameter of the prokaryotic cell?

- A** $5 \times 10^0\ \text{mm}$
- B** $5 \times 10^{-1}\ \text{mm}$
- C** $5 \times 10^2\ \text{mm}$
- D** $5 \times 10^1\ \text{mm}$

[1 mark]

Question 2

The electron micrograph shows the organelles in a leaf cell. A student uses their ruler to measure the length of the scale bar, which they find to be 1.5 cm.



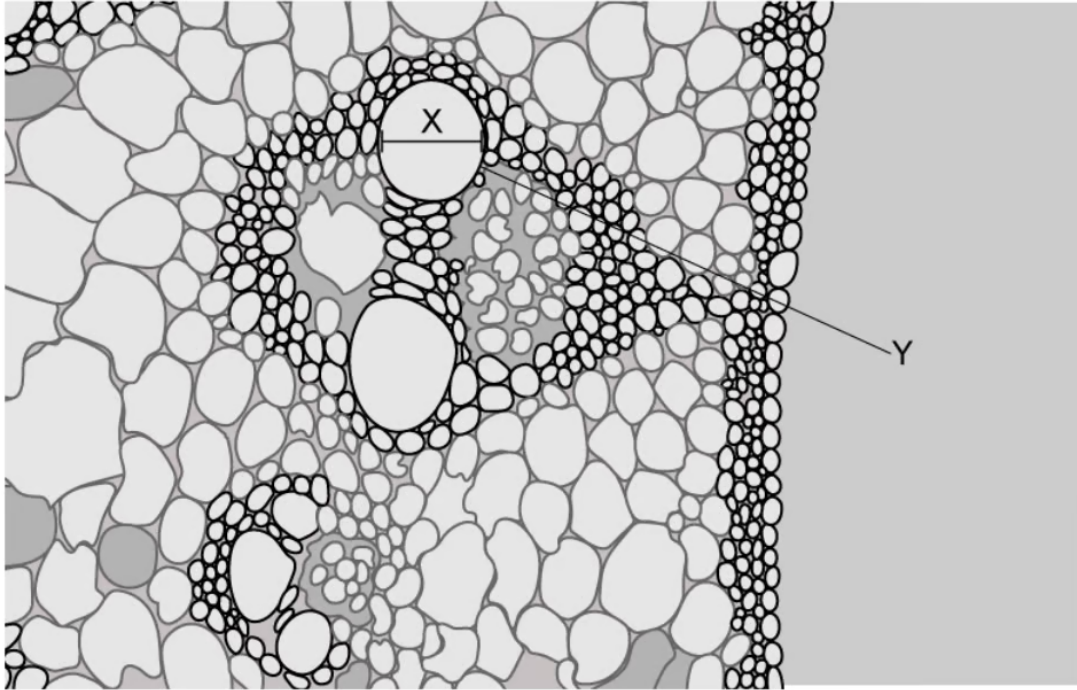
What is the magnification?

- A $\times 7\ 000$
- B $\times 7.5$
- C $\times 3\ 000$
- D $\times 300$

[1 mark]

Question 3

The electron micrograph below shows a root vascular system. The magnification of the image is $\times 200$. A student uses a ruler to measure distance X and finds it to be 10 mm.



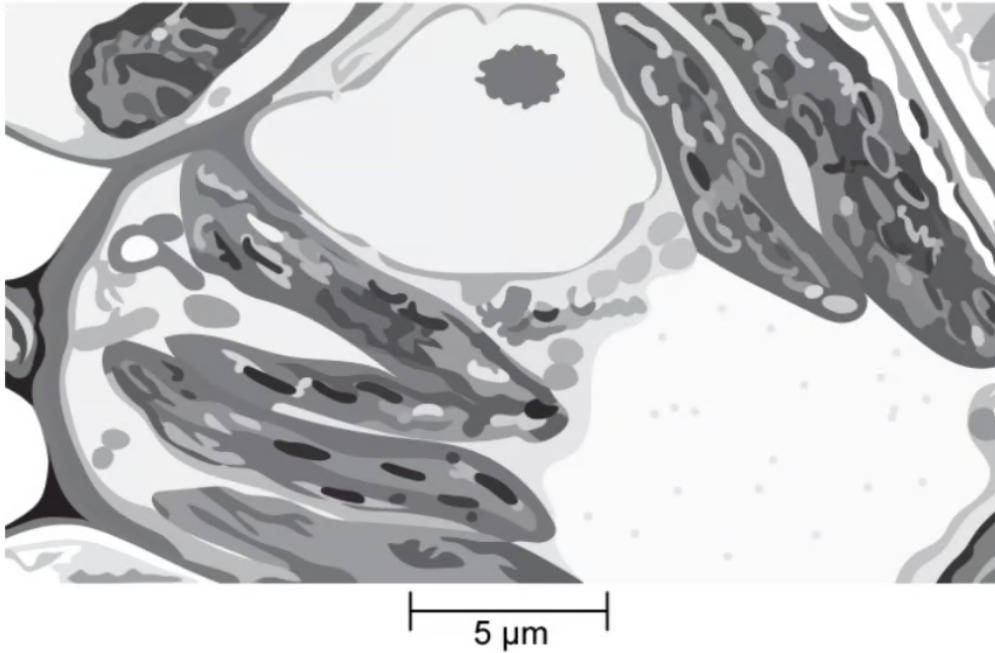
What is the diameter of the cell labelled Y?

- A 100 μm
- B 50 μm
- C 10 μm
- D 5 μm

[1 mark]

Question 4

The electron micrograph of the plant cell has a 2 cm scale line labelled 5 μm .



What is the magnification?

- A** $\times 5\,000$
- B** $\times 4\,000$
- C** $\times 2\,000$
- D** $\times 1\,000$

[1 mark]

Question 5

Erythrocytes (red blood cells) have a diameter of 7 000 nm. Pancreatic cells have a diameter of 35 μm .

Which of these statements is correct about the relative sizes of these cells?

- A** The erythrocytes are 5 times smaller.
- B** The erythrocytes are 50 times smaller.
- C** The erythrocytes are 5 times larger.
- D** The erythrocytes are 50 times larger.

[1 mark]

Question 6

Which of the following ideas are part of cell theory?

- I. Cells are the smallest unit of life.
- II. Cells show great variety in shape and structure.
- III. Cells are derived from other cells (pre-existing cells) by division.

- A** I only
- B** II only
- C** I and III only
- D** II and III only

[1 mark]

Question 7

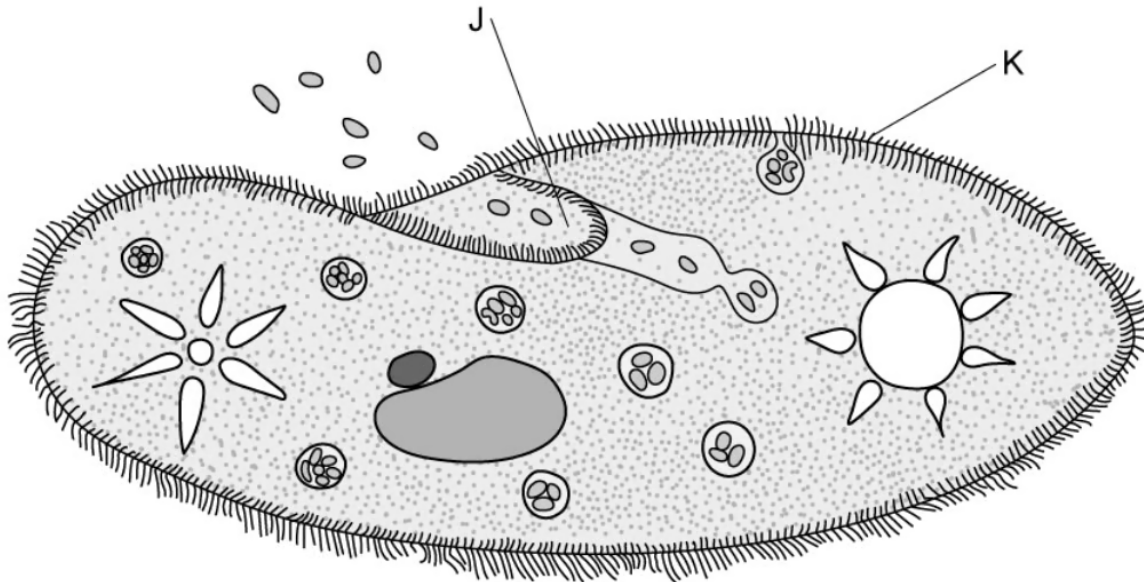
Which property of stem cells makes them suitable for therapeutic uses?

- A** They can differentiate into specialised cells.
- B** They can produce chemicals that destroy viruses.
- C** They can form gametes when they divide by mitosis.
- D** They have chromosomes that are suitable for gene transfer.

[1 mark]

Question 8

A *Paramecium* is shown in the image below.



Which functions are structures **J** and **K** responsible for carrying out in *Paramecium*?

	J	K
A	Respiration	Movement
B	Feeding	Movement
C	Excretion	Respiration
D	DNA replication	Digestion

[1 mark]

Question 9

What happens to the surface area:volume ratio of a cell as the cell grows and increases in size?

- A** It does not change.
- B** It increases.
- C** It decreases.
- D** It doubles as the cell doubles in size.

[1 mark]

Question 10

Which of the following statements relate to Stargardt's disease?

- I. There is neuron death in the part of the midbrain that controls subconscious muscle activities.
- II. There is a mutation in a gene for active transport in photoreceptor cells.
- III. β -cells of the pancreas are destroyed by the body's immune system.
- IV. There is a breakdown of light-sensitive cells in the retina.

- A** I only
- B** I and II only
- C** II and III only
- D** II and IV only

[1 mark]