

# 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.

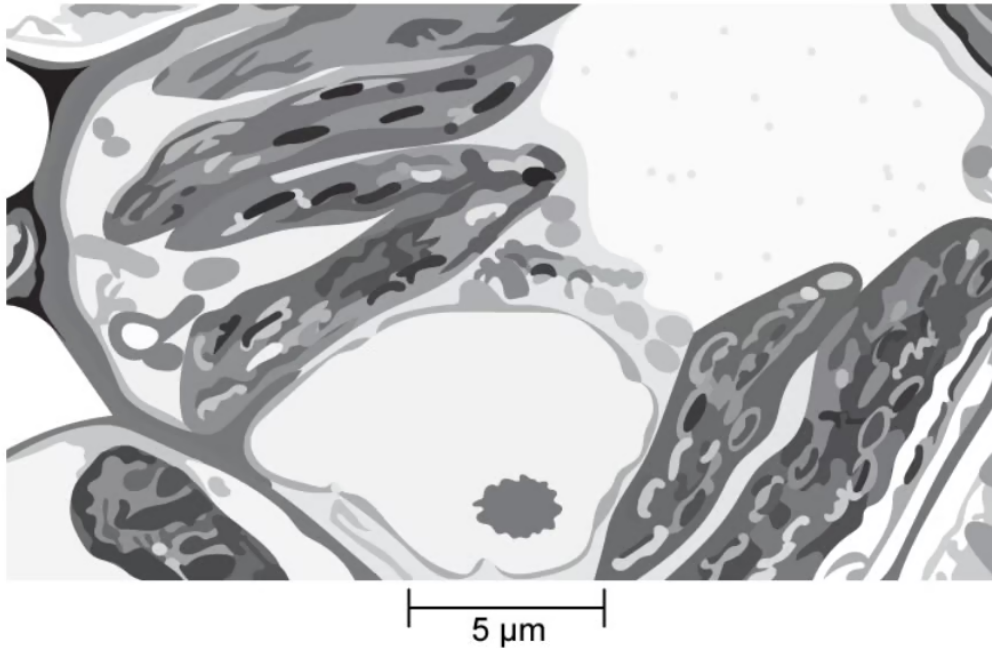
In the electron micrograph that is produced by the electron microscope, what is the diameter of the prokaryotic cell?

- 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.



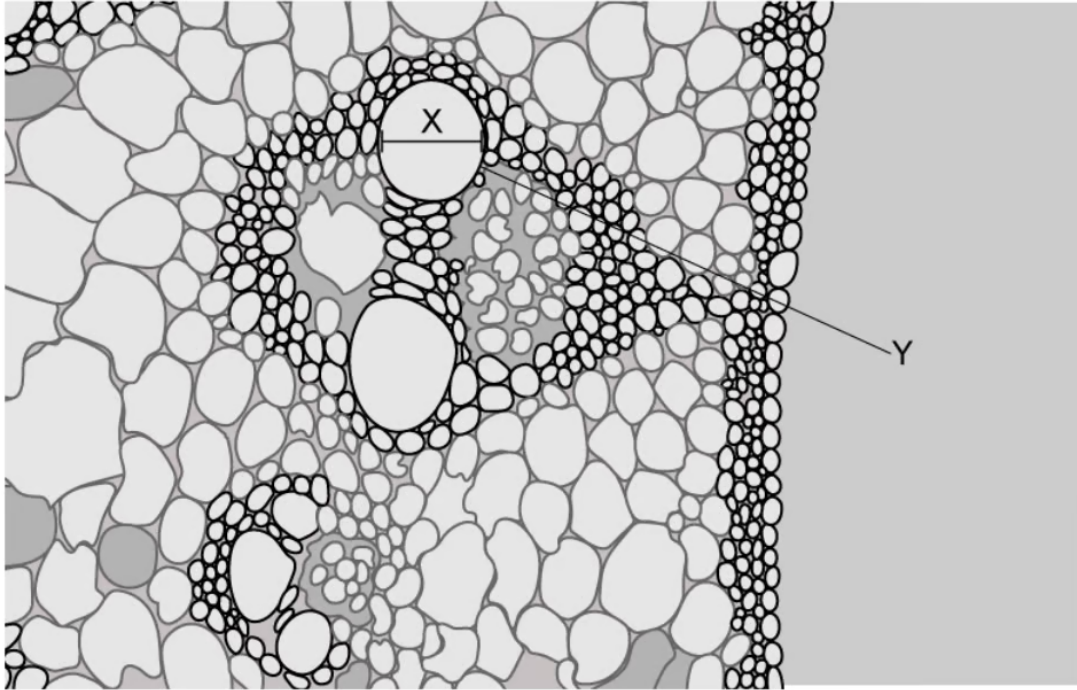
What is the magnification?

- 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.



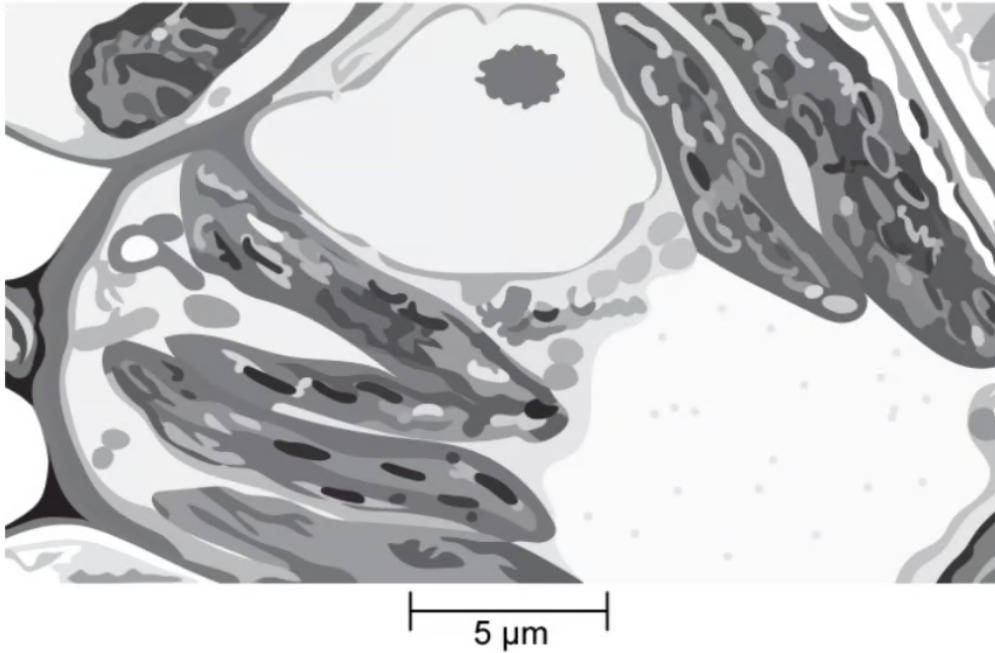
What is the diameter of the cell labelled Y?

- A 100  $\mu\text{m}$
- B 50  $\mu\text{m}$
- C 10  $\mu\text{m}$
- D 5  $\mu\text{m}$

[1 mark]

**Question 4**

The electron micrograph of the plant cell has a 2 cm scale line labelled 5  $\mu\text{m}$ .



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  $\mu\text{m}$ .

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**

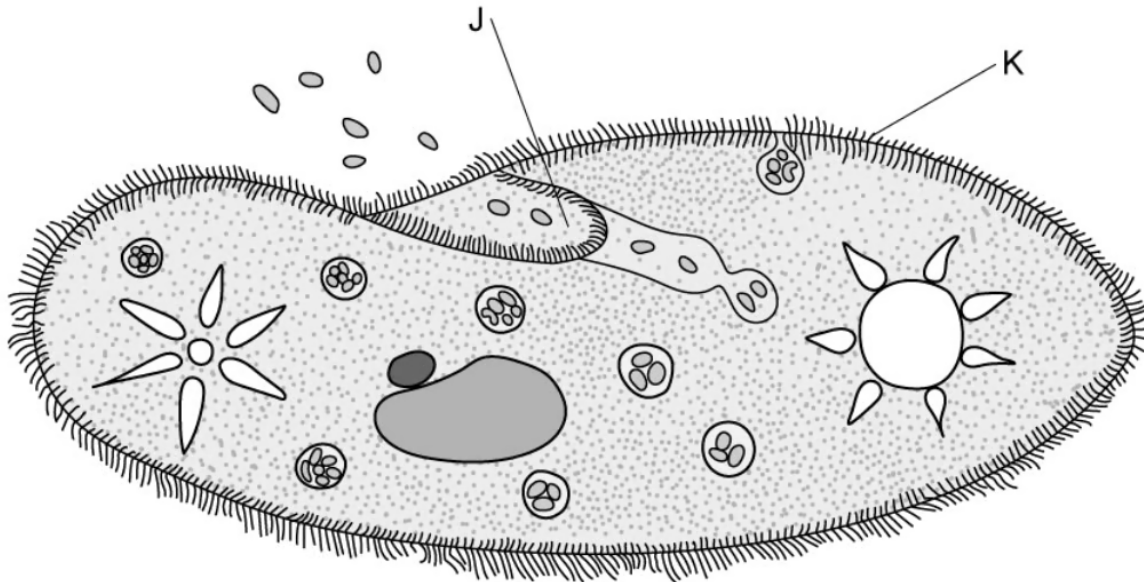
Which property of stem cells makes them suitable for therapeutic uses?

- 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*?

	<b>J</b>	<b>K</b>
<b>A</b>	Respiration	Movement
<b>B</b>	Feeding	Movement
<b>C</b>	Excretion	Respiration
<b>D</b>	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.  $\beta$ -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]