

(d) What is the advantage of using the type of microscope you named in part (c)?

Tick **one** box.

Cheaper

Higher magnification

Lower resolution

(1)

(e) The cheek cell in **Figure 2** is magnified 250 times.

The width of the cell is shown by the line **D** to **E**.

Figure 2



Calculate the width of the cheek cell in micrometres (μm).

Complete the following steps.

Measure the width of the cell using a ruler _____ mm

Use the equation to work out the real width of the cell in mm:

real size = $\frac{\text{image size}}{\text{magnification}}$ _____ mm

Convert mm to μm _____ μm

(3)

(f) A red blood cell is $8\ \mu\text{m}$ in diameter.

A bacterial cell is 40 times smaller.

Calculate the diameter of the bacterial cell.

Tick **one** box.

$0.02\ \mu\text{m}$

$0.2\ \mu\text{m}$

$2.0\ \mu\text{m}$

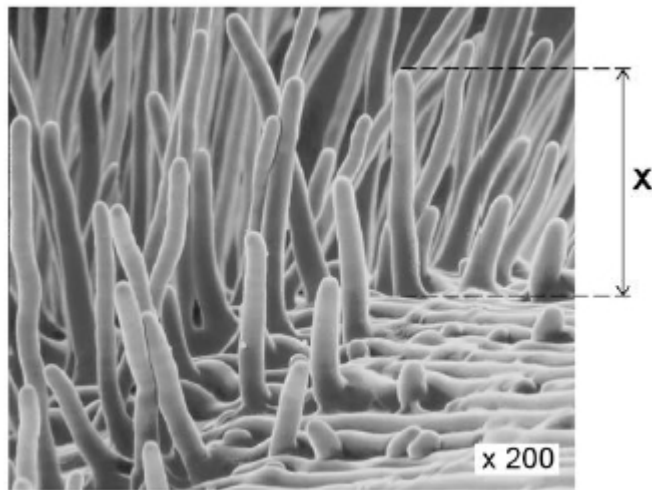
$20.0\ \mu\text{m}$

(1)

(Total 9 marks)

6.

The image below shows part of a root from a cress plant.



(a) What type of microscope was used to create the image above?

(1)

- (b) The magnification of the cress root in the image above is $\times 200$.
There are 1000 micrometres (μm) in a millimetre (mm).

Calculate the real length of the root hair, **X**.

Give your answer in micrometres (μm).

Real length **X** = _____ μm

(2)

- (c) Root hair cells take up water from the soil.

Explain **one** way in which the root hair cell is adapted to this function.

(2)

The table shows the water uptake by a plant's roots on two different days.

	Mean water uptake in cm^3 per hour
Cold day	1.8
Hot day	3.4

- (d) Explain why the mean rate of water uptake is higher on a hot day than on a cold day.

(3)

- (e) The concentration of mineral ions in the soil is lower than in root hair cells.
Root hair cells take up mineral ions from the soil.
Root hair cells contain mitochondria.

Explain why root hair cells contain mitochondria.

(4)
(Total 12 marks)