

2 **K1** is a slide of a stained transverse section through a root.

- (a) (i) Draw a large plan diagram of the region on **K1** indicated by the shaded area in Fig. 2.1. Use a sharp pencil.

Use **one** ruled label line and the label **T** to identify a tissue involved in transport of substances throughout the plant.

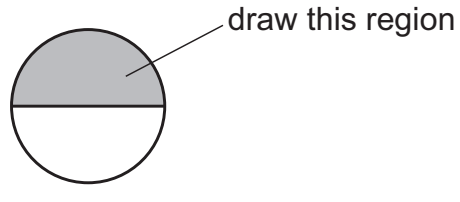


Fig. 2.1

[5]

- (ii) Observe the cells in the centre of the root on **K1**.

Select a group of **four** adjacent cells.

Each cell must touch at least **one** of the other cells.

Make a large drawing of this group of **four** cells.

[4]

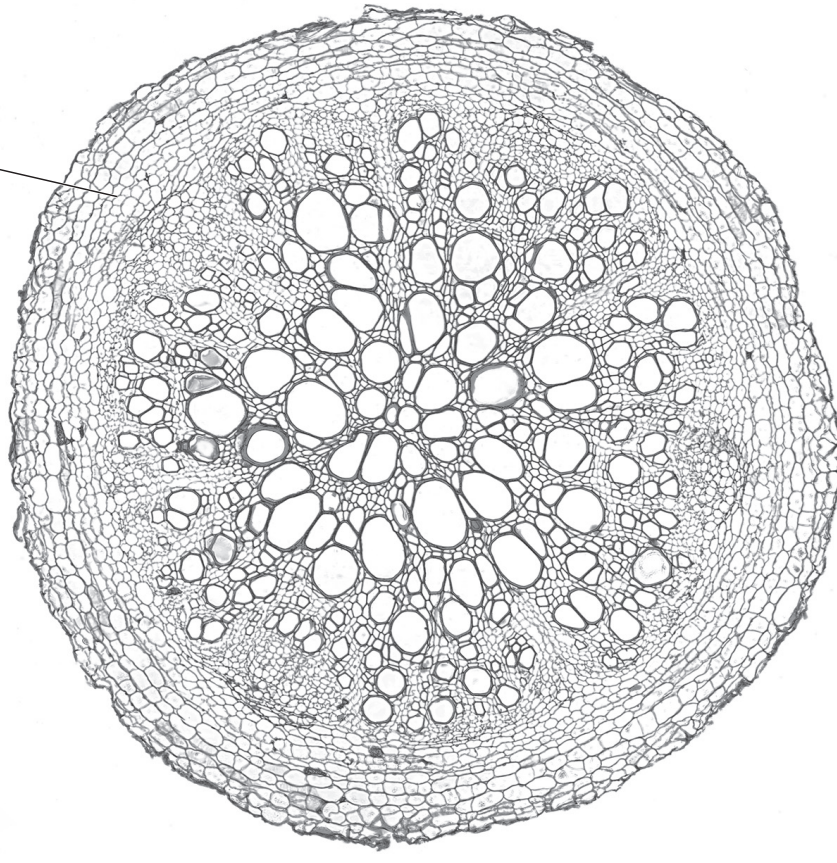
- (b) Fig. 2.2 is a photomicrograph of a stained transverse section through the root of a different plant to **K1**.

One difference between the section in Fig. 2.2 and the section on **K1** has been labelled.

Identify **three** other observable differences between the section in Fig. 2.2 and the section on **K1**.

Draw **three** label lines on Fig. 2.2 to label the **three** differences you have identified. You should complete the labels to describe the differences you observe.

The width of the cortex tissue is smaller in Fig. 2.2 than on **K1**



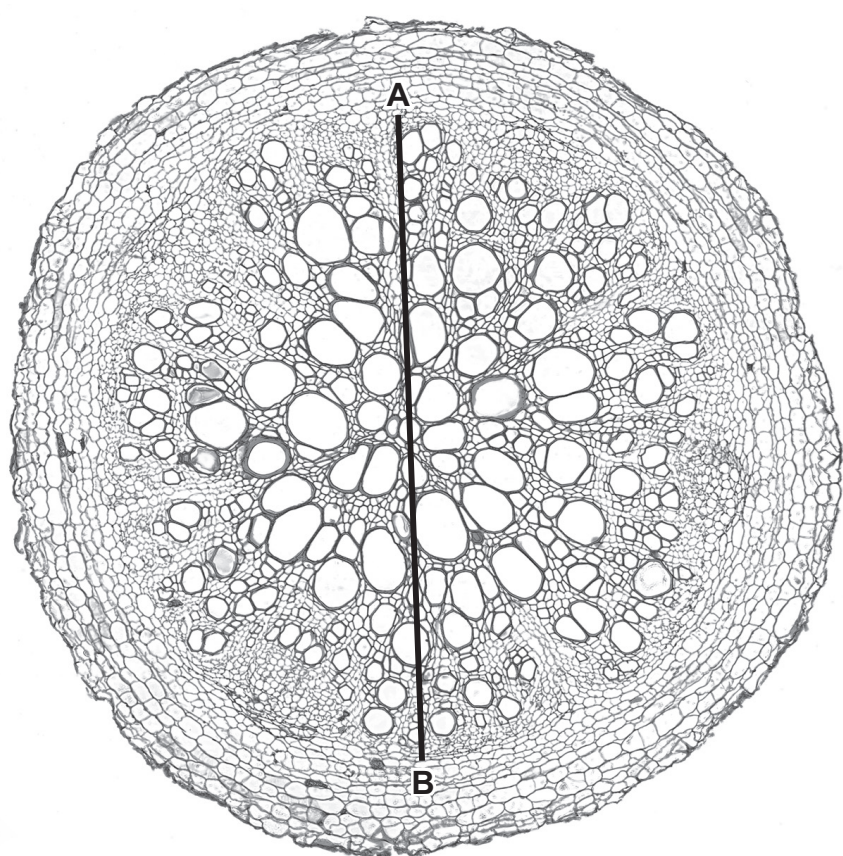
magnification $\times 35$

Fig. 2.2

[4]

- (c) A student was asked to find the area of the vascular tissue in a transverse section of root.

The student grew one plant for three weeks and took a section from one of the roots. This section is shown in Fig. 2.3.



magnification $\times 35$

Fig. 2.3

The vascular tissue is the central region of the section.

Assume that the vascular tissue is a circle. The line **A–B** is the diameter of the vascular tissue.

- (i) Calculate the actual area of the vascular tissue.

Use the formula: $\text{area} = \pi r^2$, where $\pi = 3.14$.

actual area of the vascular tissue = mm^2

[4]

- (ii) The student wrote a hypothesis which stated that:

The area of vascular tissue in a root section changes as the plant grows.

Suggest modifications to the method used in (c) to investigate this hypothesis.

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[3]