

**GCSE Biology B (Twenty First Century Science)**  
**J257/02** Depth in Biology (Foundation)

**Question Set 17**

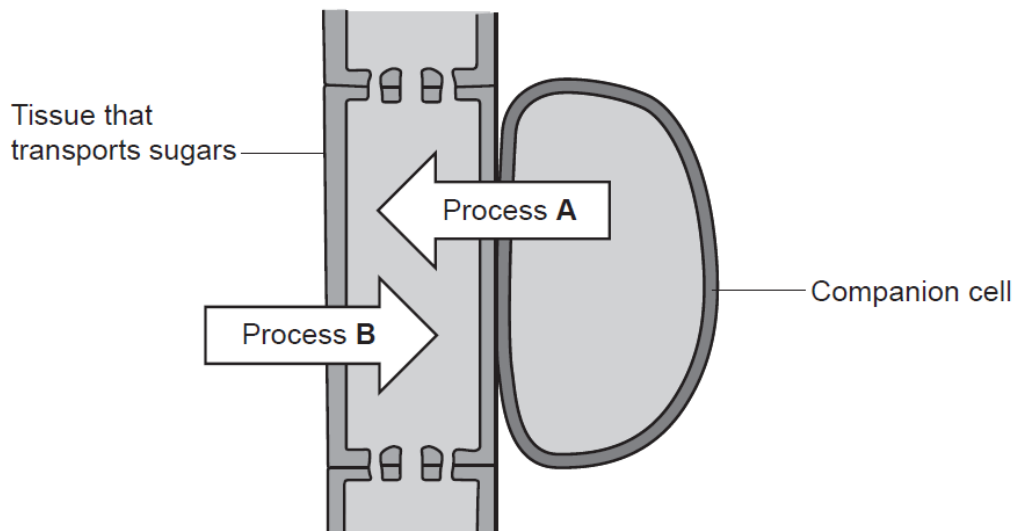
- 1 Mistletoe is a very unusual plant. Instead of growing in the ground, mistletoe grows on another plant such as a tree, as shown in **Fig. 5.1**.



**Fig. 5.1**

- (a) Mistletoe takes most of the sugar it needs from a tissue in the tree. This tissue transports sugars around the tree.

A diagram of the tissue in the tree is shown in **Fig. 5.2**.



**Fig. 5.2**

- (i) What is the name of the tissue in the tree that the mistletoe takes sugars from? [1]

- (ii) Process **A** transports sugars into the tissue in the tree.

What is the name of process **A**?

Put a **ring** around the correct answer.

**active transport    osmosis    translocation    transpiration** [1]

- (iii) Process **B** transports water into the tissue in the tree.

What is the name of process **B**?

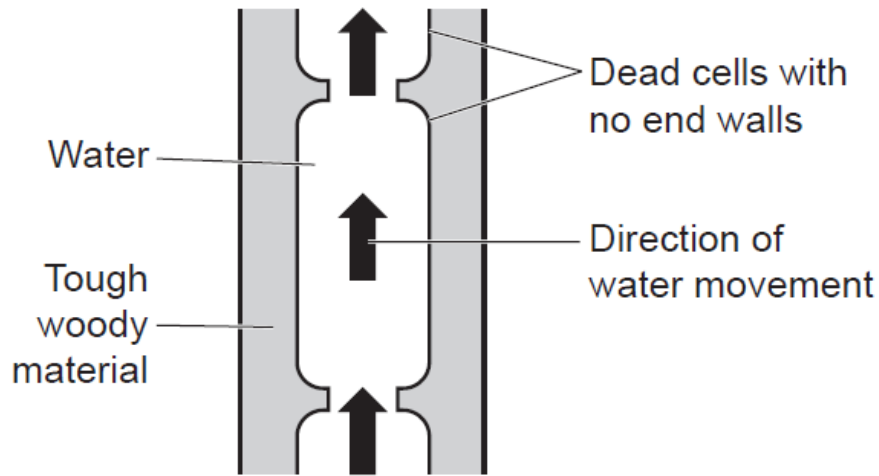
Put a **ring** around the correct answer.

**active transport    osmosis    translocation    transpiration** [1]

(b) Mistletoe does not have roots in the soil.

Mistletoe takes all the water it needs from a **different** tissue in the tree. This tissue transports water from the tree's roots to the tree's leaves.

A diagram of this tissue in the tree is shown in **Fig. 5.3**.



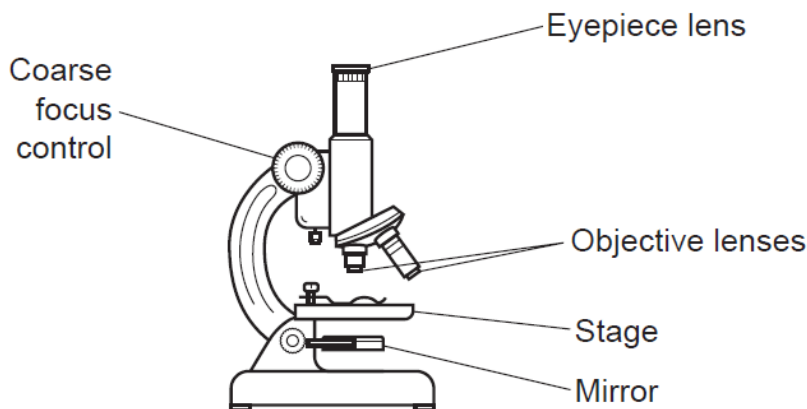
**Fig. 5.3**

(i) What is the name of the tissue in the tree that the mistletoe takes water from? [1]

(ii) Explain why water moves through this tissue from the roots to the leaves in a normal tree. [4]

(c) Mistletoe can catch diseases from the tree it is growing on.

Sarah collects some microorganisms from a piece of mistletoe. She wants to use a light microscope, as shown in **Fig. 5.4**, to look at the microorganisms.



**Fig. 5.4**

- (i) Sarah puts a slide with a sample of the microorganisms on the microscope stage.

She plans to use the microscope's mirror to reflect direct sunlight through the slide so she can see the microorganisms.

Explain why this is dangerous, and suggest what Sarah could do instead to be safer.

[2]

- (ii) Sarah looks into the eyepiece lens and turns the coarse focus control to move the objective lens towards the slide.

Explain why this is dangerous, and suggest what Sarah could do instead to be safer.

[2]

- (d) Fig. 5.5 shows an image of some of the microorganisms from the mistletoe.

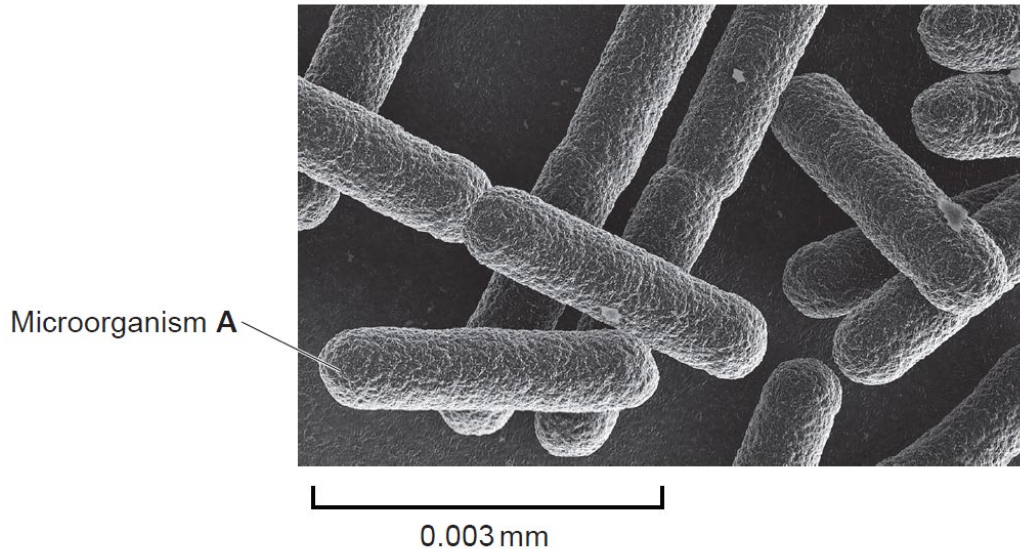


Fig. 5.5

The actual length of microorganism A is 0.003 mm. In the image in Fig. 5.5 it appears to be 45 mm long.

Calculate the magnification of the image in Fig. 5.5.

Use the equation: magnification = measured size ÷ actual size

Magnification = × ..... [2]

- (e) In Sarah's light microscope:

- The magnification of the eyepiece lens is ×10.
- The magnification of the most powerful objective lens is ×40.

Was the image in Fig. 5.5 taken using Sarah's light microscope?

Yes

No

Explain your answer.

[2]

**Total Marks for Question Set 17: 16**

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