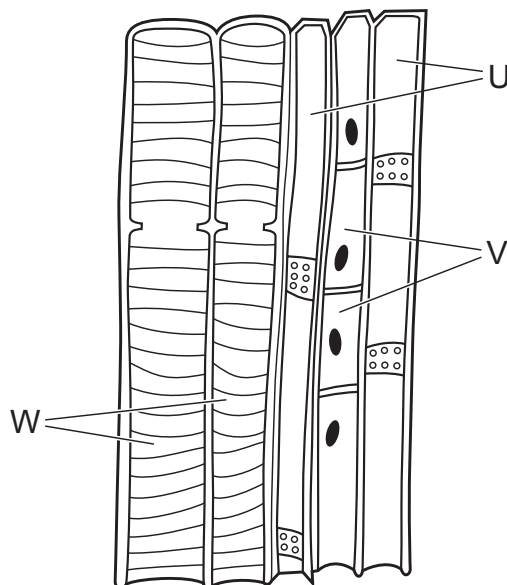


- 26** The diagram shows a vertical section through part of the stem of a dicotyledonous plant. Three types of structures are labelled.



What are the structures U, V and W?

|          | companion cells | phloem sieve tube elements | xylem vessel elements |
|----------|-----------------|----------------------------|-----------------------|
| <b>A</b> | U               | W                          | V                     |
| <b>B</b> | V               | U                          | W                     |
| <b>C</b> | U               | V                          | W                     |
| <b>D</b> | W               | V                          | U                     |

- 27** Which features of xylem vessels help to reduce the resistance to water flow?

- 1 Lignin forms an incomplete secondary wall.
- 2 There are **no** cross walls between the vessel elements.
- 3 The xylem vessels form narrow tubes.

**A** 1, 2 and 3      **B** 1 and 2 only      **C** 2 only      **D** 3 only

- 28** What causes water to move from the root hair cells to the endodermis?

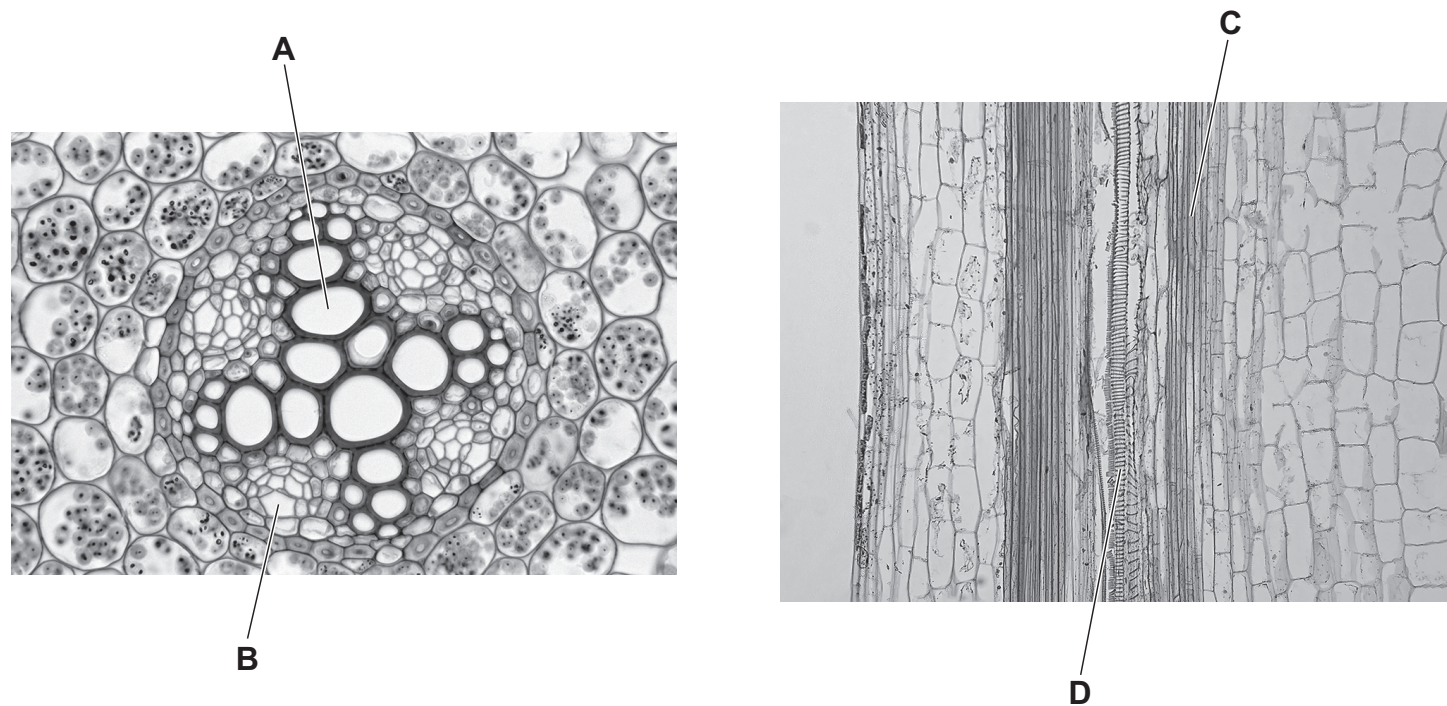
- A** diffusion through cell walls and osmosis down a water potential gradient in the cytoplasm  
**B** diffusion through the symplast and osmosis and root pressure through the apoplast  
**C** osmosis from cell vacuole to cell vacuole and active transport into the endodermis  
**D** osmosis through the intercellular spaces and diffusion in cell walls and cytoplasm

29 Which changes occur as carbohydrate is moved into a sink?

|   | water potential of the sieve tube element becomes | volume of liquid of the sieve tube element |
|---|---------------------------------------------------|--------------------------------------------|
| A | lower                                             | decreases                                  |
| B | lower                                             | increases                                  |
| C | higher                                            | decreases                                  |
| D | higher                                            | increases                                  |

28 The photomicrographs show sections of two organs of a plant.

Which letter identifies a cell found with companion cells in a tissue in a root?



29 Which row correctly describes the pressure in the xylem and the water potential in the root hair cells used in the transport of water in a transpiring plant?

|   | pressure in the xylem | water potential in root hair cells |
|---|-----------------------|------------------------------------|
| A | positive              | negative                           |
| B | positive              | positive                           |
| C | negative              | negative                           |
| D | negative              | positive                           |

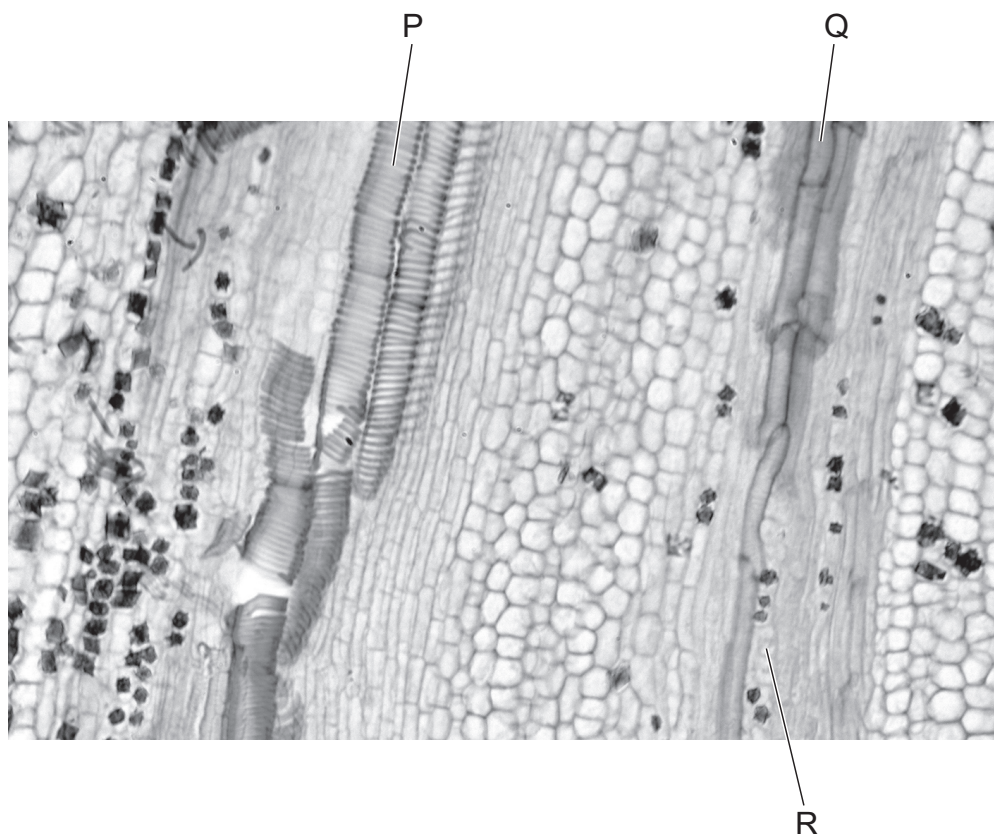
**30** Which row correctly identifies the definitions for each of the key terms used in transpiration?

|          | attraction between water molecules and walls of the xylem vessel | effect created by evaporation of water from the surface of the leaf |
|----------|------------------------------------------------------------------|---------------------------------------------------------------------|
| <b>A</b> | cohesion                                                         | adhesion                                                            |
| <b>B</b> | adhesion                                                         | tension                                                             |
| <b>C</b> | cohesion                                                         | tension                                                             |
| <b>D</b> | tension                                                          | cohesion                                                            |

**31** Which combination of features is characteristic of a phloem sieve tube element immediately after it is loaded from a source?

|          | water potential of the phloem sieve tube element | lignification of the cell wall |
|----------|--------------------------------------------------|--------------------------------|
| <b>A</b> | higher than source                               | <b>not</b> present             |
| <b>B</b> | higher than source                               | present                        |
| <b>C</b> | lower than source                                | <b>not</b> present             |
| <b>D</b> | lower than source                                | present                        |

**28** The photomicrograph shows a longitudinal section of part of a plant stem.



Which row correctly identifies structures P, Q and R?

|          | P                         | Q                         | R                         |
|----------|---------------------------|---------------------------|---------------------------|
| <b>A</b> | phloem sieve tube element | companion cell            | xylem vessel element      |
| <b>B</b> | phloem sieve tube element | xylem vessel element      | companion cell            |
| <b>C</b> | xylem vessel element      | phloem sieve tube element | companion cell            |
| <b>D</b> | xylem vessel element      | companion cell            | phloem sieve tube element |

**29** Which statement about the pathway taken by a water molecule travelling from the soil to the xylem is correct?

- A** A water molecule in a cortex cell that takes the symplast pathway must enter the next cortex cell by passing between two adjacent phospholipid molecules in a cell surface membrane.
- B** A water molecule can pass into xylem vessels either through pits or through the cell wall of the xylem vessel elements by osmosis.
- C** A water molecule would pass into the cytoplasm of the endodermal cell if it always takes the apoplast pathway all the way to the xylem.
- D** A water molecule that has left the endodermal cells can travel by either the apoplast pathway or symplast pathway.