1. Which statement is correct?

   ☐ xylem carries water and minerals up; phloem carries dissolved sugars

   ☐ both carry only water

   ☐ xylem carries sugars; phloem carries water up

   ☐ both carry only sugars

2. Water enters a root hair cell by osmosis because the root hair has:

   ☐ a higher water potential than the soil

   ☐ no cell membrane

   ☐ no cytoplasm

   ☐ a lower water potential than the surrounding soil water

3. Transpiration is:

   ☐ the transport of sucrose in phloem

   ☐ the loss of water vapour from a plant

   ☐ the making of sugars in the leaf

   ☐ the uptake of water at the roots

4. Translocation in the phloem transports:

   ☐ sugars (mainly sucrose)

   ☐ oxygen

   ☐ only water

   ☐ minerals only

5. Xylem vessels are strengthened and waterproofed by _____ in their walls.

   _____

6. Water enters root hair cells from the soil by _____.

   _____

7. Water vapour leaves the leaf mainly by diffusing out through pores called _____.

   _____

8. In translocation, a ”source” is:

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   ☐ the xylem

   ☐ where the assimilate is used or stored

   ☐ where the assimilate is made or released, such as a photosynthesising leaf

9. A mature xylem vessel is a living cell, full of cytoplasm and a nucleus.

   ☐ True ☐ False

10. By forcing water through cell membranes, the Casparian strip lets the plant control what enters the xylem.

    ☐ True ☐ False

1. **xylem carries water and minerals up; phloem carries dissolved sugars**

   Xylem moves water and mineral ions upward; phloem moves dissolved assimilates (mainly sucrose).

2. **a lower water potential than the surrounding soil water**

   Water moves down the water-potential gradient, into the root hair which has the lower water potential.

3. **the loss of water vapour from a plant**

   Transpiration is water evaporating inside the leaf and the vapour diffusing out through the stomata.

4. **sugars (mainly sucrose)**

   Phloem carries dissolved sugars (assimilates), unlike xylem which carries water and minerals.

5. **lignin**

   Lignin makes a strong, waterproof, hollow pipe – and the cells die, leaving an open tube.

6. **osmosis**

   Water moves down a water-potential gradient into the root hair.

7. **stomata**

   After evaporating from leaf cell surfaces, the vapour diffuses out through the stomata.

8. **where the assimilate is made or released, such as a photosynthesising leaf**

   A source makes/releases the assimilate (e.g. a leaf); a sink uses or stores it (e.g. a growing root).

9. **False**

   Xylem vessels are dead and empty – that is what makes them a fast, open pipe for water.

10. **True**

    Crossing a membrane means selective transport proteins decide what passes – so the plant controls xylem contents.

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