

Topic 5: Support and transport systems in plants (transpiration)

1.1 The stoma or pore closes when ... *

- ☐ the guard cells as flaccid.
- ☐ the guard cells are turgid.
- ☐ turgidity is increased and the thick walls come together.
- ☐ the turgor is decreased and the thick walls become parted.

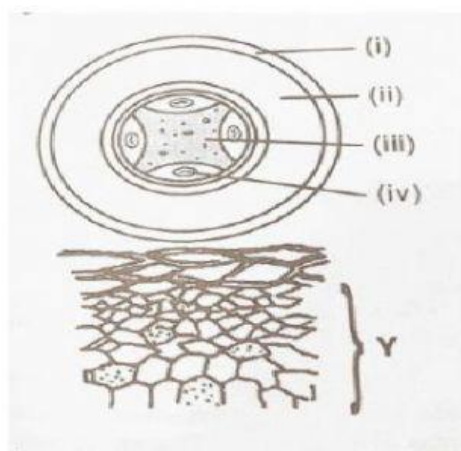
1.2 Indicate which of the following will not have any value in limiting (stopping) transpiration in plants... *

- ☐ a thick cuticle
- ☐ a flat stem
- ☐ sunken stomata
- ☐ hairs on the leaf

1.3 A plant cell is turgid when ... *

- ☐ the pressure potential is greater than the turgor pressure.
- ☐ no more water can enter the cell.
- ☐ the water potential is lower than the adjacent cell.
- ☐ water has been moving out of its vacuole.

Questions 1.4 - 1.6 relate to the diagram below.



1.4 Which tissue is indicated by (ii)? *

- ☐ epidermis
- ☐ xylem
- ☐ parenchyma
- ☐ phloem

1.5 Water and mineral salts are mainly transported upwards through: *

- ☐ (i)
- ☐ (ii)
- ☐ (iii)
- ☐ (iv)

1.6 Root hairs develop from: *

- ☐ (i)
- ☐ (ii)
- ☐ (iii)
- ☐ (iv)

1.7 Transpiration is least affected by: *

- ☐ light intensity
- ☐ wind speed
- ☐ air temperature
- ☐ air oxygen concentration

1.8 The parts of the root hair which act as a partially permeable membrane are the following: *

- ☐ cell wall and cell membrane
- ☐ cell membrane and vacuole
- ☐ cell membrane, cytoplasm and tonoplast
- ☐ cell wall and tonoplast

1.9 Water is brought to the spongy mesophyll from the xylem by *

- ☐ flowing by osmosis in the cell walls
- ☐ flowing up the water potential gradient
- ☐ the suction force of root pressure
- ☐ moving through the cytoplasm of adjacent cells down the water potential gradient

1.10 Guard cells are: *

- ☐ kidney shaped with the concave inner wall thinner and more elastic than the outer wall.
- ☐ modified epidermal cells with no chloroplasts.
- ☐ modified epidermal cells with chloroplasts
- ☐ modified mesophyll cells

1.11 The Casperian strip: *

- ☐ is found in the epidermis.
- ☐ prevents water entering the pericycle through the cell walls.
- ☐ is permeable to water.
- ☐ consists of lignin.

1.12 A potometer is used: *

- ☐ to measure the rate of transpiration.
- ☐ demonstrate root pressure.
- ☐ demonstrate the suction force of transpiration.
- ☐ demonstrate osmosis.

1.13 Water potential in a cell is high if: *

- ☐ the cell is plasmolysed.
- ☐ the solute concentration is high.
- ☐ the solute concentration is low.
- ☐ the pressure potential is low.

1.14 Which fact is NOT true for transpiration? *

- ☐ the driving force of this process is the water potential gradient that exists between the soil and the leaves
- ☐ the plant can be cooled
- ☐ inorganic ions and water can move up the plant from the soil
- ☐ organic nutrients can be translocated to all parts of the plant

1.15 High humidity decreases the transpiration rate because:

- ☐ there is a steep diffusion gradient between the intercellular spaces and the atmosphere.
- ☐ the air is moist which reduces the water potential gradient between the intercellular air spaces and the atmosphere.
- ☐ water evaporates quickly from the cell walls in the intercellular spaces.
- ☐ the stomata will close

1.16 Too much fertiliser in the soil causes plant cells to become: *

- ☐ plasmolysed
- ☐ flaccid
- ☐ turgid
- ☐ overfull

1.17 Water travels easily in the cell walls of the: *

- ☐ endodermis
- ☐ xylem
- ☐ trachieds
- ☐ root cortex

1.18 Transpiration will be higher if: *

- ☐ guard cells are pressed together.
- ☐ stomata are closed.
- ☐ there is little water in the soil.
- ☐ the humidity of the air is low.

1.19 Water is pulled up a tree by: *

- ☐ root pressure
- ☐ capillarity
- ☐ osmotic pressure
- ☐ transpiration

1.20 Which of the following is not true of xylem vessels? *

- ☐ long, dead, empty cells which carry the products of photosynthesis
- ☐ cells thickened with lignin
- ☐ will not collapse under the suction force of transpiration
- ☐ have pits that allow for the lateral flow of water