

# Water Dynamics in Plant Production, 2nd Edition

## Multiple Choice Questions

### Chapter 4 – Properties and Energy State of Water

1. Because of the drift of electrons within the water molecule, the region of the oxygen atom:
  - (a) is positively charged
  - (b) is negatively charged
  - (c) varies in level of charge
  - (d) is not charged
2. Water molecules act as a dipole. What effect does this have on their behaviour? (There may be more than one correct answer.)
  - (a) They form a quasi-crystal structure.
  - (b) Hydrogen atoms from one molecule are constantly forming very short-term bridges with the oxygen of neighbouring molecules.
  - (c) Water molecules are attracted to charged ionic molecules.
  - (d) Bonding between molecules increases the specific heat.
  - (e) A lot of energy is required to turn water from a liquid to a vapour.
3. If water in two soils placed side by side is at the same potential but one contains more water than the other, water will:
  - (a) move from the wetter to the drier soil
  - (b) move from the drier to the wetter soil
  - (c) remain where it is
  - (d) leak on to the table
4. Which of the following statements best applies to soil water potential?
  - (a) The absolute potential of water is defined by its chemical potential.
  - (b) The potential of water depends on the ability of plants to absorb and transpire it.
  - (c) The potential of water only depends on its location in the environment of interest.
  - (d) The potential of water is a relative term.
  - (e) The potential of water depends on its ability to do work, with water at rest in a glass being defined as zero.
5. One component of water potential in a cell is its osmotic potential. Which of the following is true?
  - (a) Osmotic potential is never important in soil.
  - (b) Osmotic potential depends on the presence of plant membranes.
  - (c) As osmotic potential depends on the presence of a semi-permeable membrane, this potential can be created by an air–water interface in soil.
  - (d) Plant water uptake only depends on the osmotic potential in the cells of the root epidermis.