7 Transport in plants - answers

1 The most precise statement is (c).

2 The most accurate statement is (c). Statements (a) and (b) are correct but incomplete. Statement (d) is wrong.

3 Food made in the leaves is transported to the roots in the phloem of the vascular bundles

4 (b) An increase is humidity is likely to slow down the rate of transpiration.

5 Transpiration (a) draws water and (b) dissolved salts up the stem, and also (d) has a cooling effect on the leaves.

6 In a mature tree (in full leaf) transpiration makes by far the greater contribution to water movement through the trunk.

7 Statements (a), (b) and (d) are correct.

8 The water retained by a plant is used for photosynthesis and other chemical reactions. It is also used for maintaining cell turgor.

9 By taking the second set of readings 'without delay', the student did not allow time for a new rate to become established. The student should either have waited for 5 minutes or, better, kept taking readings until four of them were nearly the same.

When the apparatus was taken outside, several variables were changed, e.g. light intensity, temperature, humidity and air movement. There is no way of knowing which of these was contributing to the increased transpiration rate. It would have been better to vary just one condition while remaining in the laboratory, e.g. moving the apparatus from shade to sunlight.

10 The large volume of water in the conical flask, connected to a narrow capillary will behave like a giant thermometer. Small changes in temperature will produce large movements in the water column.
There is no way of re-setting the water column.
The cork will have to be removed and the apparatus set up again each time a new reading is wanted.

11 (a) The plant lost 32g in 7 hours, so its rate of transpiration was 4.6g per hour.
(b) (i) In daylight, the weight loss due to transpiration will be reduced by a gain in weight resulting from photosynthesis.
(ii) In darkness some of the decrease in weight will be due to the loss of water and carbon dioxide produced by respiration.
(c) (i) If the plant had been short of water, this might have restricted the rate of transpiration.
(ii) The plastic bag prevented evaporation taking place from the pot or the soil. Had this evaporation not been prevented, the weight loss could not have been attributed solely to

transpiration.