FlexiPrep

NCERT Class 11-Biology: Chapter – 11 Transport in Plants Part 10 (For CBSE, ICSE, IAS, NET, NRA 2022)

Question 3:

Which of these is a semipermeable membrane (S. P) and which is selectively permeable (S. L)

a. Animal Bladder

b. Plasmalemma

c. Tonoplast

d. Parchment membrane

e. Egg membrane

Answer:

a. Semi-Permeable

b. Selectively permeable

c. Selectively permeable

d. Semi-permeable

E. Semi-permeable

Question 4:

Halophytes may show presell pressure very much higher than atmospheric pressure. Explain how this can happen?

Answer:

Halophytes are plants that grow in soils having high concentration of salt. Due to the higher concentration of salt, their cell cytoplasm is hypertonic causing water from the surrounding cells or region to enter the cell cytoplasm. So the turgor pressure of the cell is higher. To make sure this pressure doesn't exceed a certain level, they have salt-secreting glands that removes excess of salts and also has vacuoles that store salt.

Question 5:

The radio labelled carbon in carbon dioxide supplied to potato plants in an experiment was seen in the tuber eventually. Trace the movement of the labelled carbon dioxide.

Answer:

If radio labelled carbon in carbon dioxide is supplied to potato plants in an experiment was seen in the tuber, it is due to the following:

When the potato plant carries out photosythesis using the CO_2 which is radiolabelled, it forms Oxygen and glucose ($C_6H_{12}O_6$) where the carbon in the glucose molecule has the radiolabelled carbon present. This glucose when is converted to sucrose takes the radioactive carbon which is transferred when the form changes. This molecules of sucrose moves via the phloem to the tuber where it is converted into starch which gets radiolabelled due to the same radiolabel carbon which is present and this starch is stored. The process of measuring is by autoradiography which detects the radioactive carbon and traces the components along with the movement in the plant body.

Question 6:

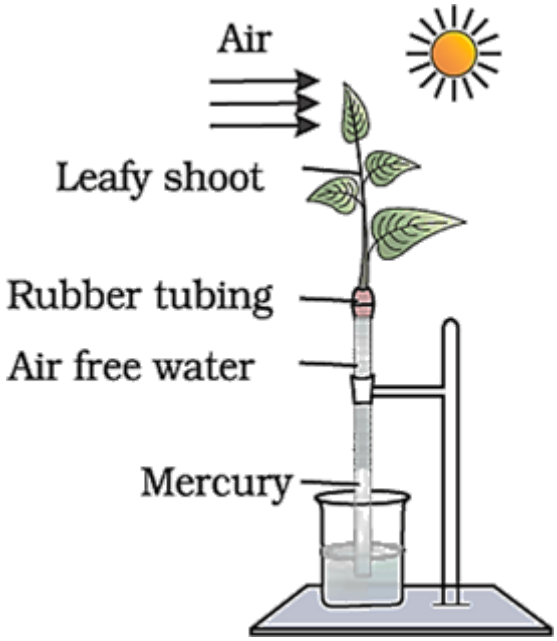
Water molecule is very polar. Polar end of molecule attracts opposite charges on another water molecule (acts like magnet) . How will you explain this property of water with reference to upward movement of water? Comment on the upward movement of water given the intermolecular hydrogen bonding in water.

Answer:

The process by which water molecules remain attached to one another via hydrogen bonding in between them is known as cohesion of the water molecules. The water column that moves upwards via the xylem vessels from the root to the leaves due to the transpiration pull does not break due to this property's contribution along with the contribution of the property of adhesion. The cohesion is responsible for providing tensile strength which aids in the pulling of the water from the roots to the tips of the leaves. The upward movement of water is via the xylem vessels where it is facilitated by three forces: adhesion (where water molecules interact with other molecules like the inner walls of the xylem) , cohesion (attachment of water molecules together forming an uninterrupted water column that does not break and does not allow cavitation to occur in xylem vessels) and surface tension.

Question 7:

Comment on the experimental setup



a. What does the setup demonstrate?

b. What will happen to the level of water if a blower is placed close to setup?

c. Will the mercury level fluctuate (go up/down) if phenyl mercuric acetate is sprayed on leaves?

Answer:

(a) The setup demonstrates the process of transpiration pull. Transpiration pull is the force with which water is pulled upwards from the roots to the leaves from where water is evaporated out via transpiration.

(b) If a blower is placed close to the setup it will provide a wind speed due to which the rate of transpiration will increase this the level of water will rise even upwards as the transpiration pull will be more. Since when the wind intensity is more, its humid content is also less so it can carry away more number of water molecules from the aerial surfaces of the plant.

(c) Phenyl mercuric acetate is an anti-transpirant. If it is sprayed on leaves, transpirational loss of water will cease or stop and mercy = ury levels will remain stable.