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TARGET NEET - 2022

BIOLOGY

TOPIC: TRANSPORT IN PLANTS

31. (1)
Reverse osmosis (RO) is a process that involves expulsion of pure water from a solution through a semipermeable membrane under the influence of higher than the osmotic pressure of the solution. Reverse osmosis is used in the process of desalination of water i.e., removing salts from saline water, as well as extra purification of water.

32. (3)
Plasmolysis occurs when water moves out of the cell and the cell membrane of a plant cell shrinks away from its cell wall. This occurs when the cell is placed in hypertonic solution (i.e., solution having more concentration of solute than cytoplasm). In plasmolysis, water is first lost from cytoplasm and then from the vacuole and causes the protoplast to shrink away from the walls.

33. (1)
A solution having low osmotic concentration as compared to another solution is called hypotonic while a solution with higher osmotic concentration is called hypertonic. When a cell is placed in hypertonic solution water moves out (from lower concentrated solution the higher concentrated solution) and shrinks. When a cell is placed in hypotonic solution, water moves in and cell swells up.

34. (3)
If a plant cell is placed in hypertonic solution plasmolysis occurs. As a result protoplast is reduced in size. This decreases turgor pressure. In a completes plasmolysed cell turgor pressure is zero. If the extreme solution does not cause any further exosmosis then, DPD = OP.

35. (3)

36. (1)
When a plant cell is kept in a solution of higher concentration, i.e., a hypertonic solution, water molecules diffuse out of the cell. This outward movement of water molecules from the cell sap into the outer solution is called exosmosis. As a result of this, the plasmalemma leaves the cell wall and the whole cytoplasm contracts in the centre. This process is called plasmolysis and the cell is called in flaccid condition. In a flaccid cell the TP (turgor pressure) becomes zero.

37. (3)
Imbibition involves absorption of solvent or water by a solid substance. Imbibition does not produce solution. It can develop a very high pressure (up to 1000atm) called imbibition pressure.

38. (1)
When solute particles are added to a solution, the diffusion pressure of the solution gets lowered. The amount by which diffusion pressure of a solution is lower than that of its pure solvent is known as diffusion pressure deficit.
The relationship between DPD, OP and TP is, DPD = OP – TP.
In a fully turgid cell OP = TP.
So, DPD = 0.
In a flaccid cell TP = 0. So, DPD = OP

39. (2)
In apoplast pathway, water passes from root hairs to xylem through the walls of intervening cells and intercellular spaces without crossing any membrane or cytoplasm. It provides the least resistance to movement of water and is faster.

40. (2)