QB365

Important Questions - Transport in Plants

11th Standard CBSE

Biology Reg.No. : | | | | | | |

Time : 01:00:00 Hrs

Total Marks : 50

Section-A

1) Mention the type of molecular movement which is highly selective nd also requires special membrane proteins, but works without the requirement of energy **1**

2) How do root hairs increase the absorption of water by plants? **1**

3) Identify the vascular tissue responsible for translocation of organic and inorganic substance from leaves to other parts of the plant. **1**

4) A flowering plant is planted in an earthen pot and irrigated, Urea is added to make the plant grow faster, but after some time the plant dies. This may be due to which factor? **1**

5) Imbibition is considered a method of diffusion comment **1**

6) A gardener forgot to water a potted for a day during summer, what will happen to the plant? Do you think it reversible? If yes, how? **1**

7) Is there any involvement of osmosis in the apoplast pathway?Yes or no?If no give reason. **1**

8) Water moves up against gravity and even for a tree of 20m height, the tip receives water within two hours.The most important physiological phenomenon, Which is responsible for the upward movement of water is **1**

9) Root pressure cannot account for the translocation of water.True or false?Explain. **1**

10) When does wilting occur? **1**

Section-B

11) Mention two factors on which net direction of molecules and rate of osmosis depends **2**

12) Why is osmotic potential given a negative sign? **2**

13) Distinguish between exosmosis and endosmosis **2**

14) The apoplast pathway occurs inside cortex not in the endodermis?Give reason. **2**

15) How is the mycorrhizal association helpful in absorption of water and minerals in plants? **2**

16) Mention two condition which allow the root pressure to occur. **2**

17) When separated by a semipermeable membrane, water enters the sugar solution. What would you call the sugar solution? Osmotically active or inactive? **2**

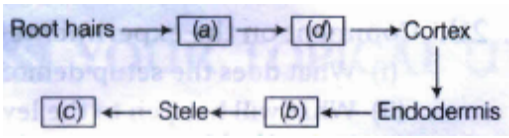
18) State the fact behind why xylem sap flows out from the cut end if a well-hydrated plant is cut below the first leaf or near the base of stem. **2**

19) If one wants to find minerals in the form they are mobilised in the plant, how will the analysis of the exudate helps? **2**

20) State the role played by roots in mycorrhizal association. **2**

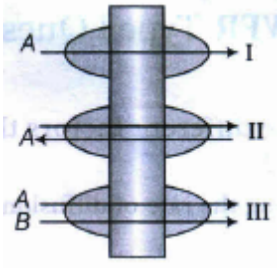
Section-C

21) Complete the pathway of water absorption in roots. **5**

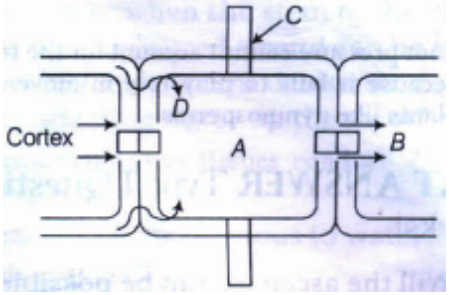


22) Under what condition the rate of transpiration will be maximum, when soil is dry and atmosphere is humid or when soil is humid and atmosphere is dry? given reason. **5**

23) Identify the process occurring in I, II and III. **5**



24) Observe the diagram given and answer the following questions. **5**



(i) Name the cell A and B.

(ii) Identify C and name the substance it is made of.

(iii) Name the pathway of water movement represented as D.

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Section-A

1) Facilitated passive diffusion **1**

2) **1**

Root hairs increase the surface area of roots. This helps in making contact with larger volume of water.Thus, the presence of root hairs helps in absorption by plants.

3) Phloem is responsible for this type of translocation. **1**

4) As urea content makes the soil hypertonic in nature, therefore, the plant dies due to exosmosis **1**

5) **1**

Imbibition is is considered as a method of diffusion because the movement of water occurs along the centration gradient during this process

6) **1**

Wilting occurs due to excessive loss of water through transpiration. It is a reversible process as if the plant is watered again on the next day, it will come its original form.

7) 1

No, there is no involvement of osmosis in the apoplast pathways because in this pathway living parts of cells (i.e., protoplasts) are not included.

8) Transpirational pull. 1

9) 1

Root pressure cannot account for the translocation of water because it fails to play role in movement of water in tall plants like gymnosperms.

10) 1

Wilting occurs whenever the turgor pressure in non-lignified plant cells falls towards zero, as a result of diminished water in the cells

Section-B

11) The two factors responsible are 2

(i) Pressure gradient

(ii) Concentration gradient

12) 2

Osmotic potential is given negative sign because when pure water (zero water potential) has another substance dissolved in it, the water molecules have less potential to move. Due to which osmotic potential of a solution become less than zero. i.e., negative

13) 2

Difference between exosmosis and endosmosis are

Exosmosis	Endosmosis
The outward flow of water from the cell when placed in more concentrated solution like sugar solution (hypertonic)	The inflow of solvent (water) into a cell from outside when cell is placed in distilled water
Cell shrinks in this case and becomes flaccid in nature	Cell swells up in this case and becomes turgid in nature

14) 2

The apoplast pathway occurs in cortex, until it reaches the endodermis because at the endodermis, the cellulosic cell wall of the cells of the endodermis have a band of suberised matrix called Casparian strip, which is impermeable and prevents the movement of water.

15) 2

A mycorrhiza is a symbiotic association of a fungus with a root system. The fungal filaments form a network around the young root by penetrating inside the root cells.The hyphae of fungal part possesses a very large surface area that absorbs mineral ions and water from soil from a larger volume of soil perhaps not possible by the roots to perform. The fungus thus, provides minerals and water to the roots of the plant and in turn the sugars and N-containing compounds are provided to the fungus present in roots.

16) **2**

Root pressure occur under the following conditions

(i) When there is plenty of atmospheric moisture or high humidity.

(ii) When evaporation or transpiration is low during low temperatures at the night and during early morning.

17) **2**

In such condition, the sugar solution known to be osmotically active because the sugar solution possesses low water potential due to which it causes osmotic entry of water into it.

18) **2**

Flow of xylem sap through the cut end is called exudation. It occurs due to hydrostatic pressure developed in the root system by the accumulation of water absorbed by the root cells. Such pressure is called root pressure.

19) **2**

An analysis of the xylem exudates shows that through some of the nitrogen travels as inorganic travels as inorganic ions, much of it is carried in the organic form as amino acids and related compounds. Similarly, small amount of phosphorus and sulphur are carried as organic compunds.In addition, small amount of exchange of materials does take between xylem and phloem.

20) Roots in mycorrhizal association provide sugars and N-containing compounds to the mycorrhiza. **2**

Section-C

21) (a) Epidermis (b) Pericycle (c)Xylem (d) Hypodermis **5**

22) **5**

The rate of transpiration will be maximum when the soil is humid and atmosphere is dry because of following reasons.

(i) Availability of more water in the soil is necessary for the absorption of water by the roots in order to carry it up to the xylem. Thus, lack of water decrease transpiration and over al health of the plants. Whereas, more water in soil increase transpiration.

(ii) In dry climates, transpiration is increased. Water is forced to diffuse more rapidly in to the air due to the concentration difference between the environment outside the plant. Low humidity creates a vapour gradient between the plant and the air.In dry air, there is lack of water, forcing water to be pulled from the plant to the atmosphere increasing transpiration. Therefore, in humid climates, transpiration is less affected by diffusion.

23) I - Uniport transport II - Antiport transport, III - Symport transport **5**

24) (i) A is endodermal cell and cell B is pericycle. **5**

(ii) Cis casparian strip. It is made up of substance called suberin.

(iii) The pathway of water movement represented as D is apoplast pathway.