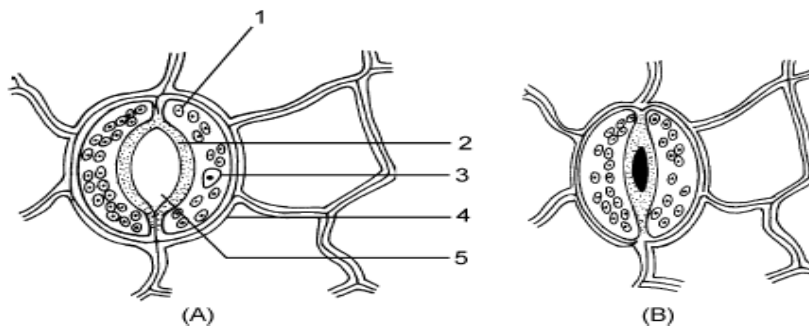


Board – ICSE**Class – 10****Topic – Absorption by Root**

1. Write the correct answers from the given options:
 - i. What is responsible for guttation?
 - (a) Osmotic pressure.
 - (b) Root pressure.
 - (c) Suction pressure.
 - (d) Capillarity.
 - ii. Active salt absorption by the roots depends on:
 - (a) Active water absorption.
 - (b) Activity of xylem cells.
 - (c) Expenditure of energy.
 - (d) Breaking up of water molecule.
2. Two potatoes cube each 1 cm^3 in size, were placed separately in two containers (A and B) the container (A) having water and the other (B) containing concentrated sugar solution. After 24 hours when the cubes were examined, those placed in water were found to be firm and had increased slightly in size and those placed in concentrated sugar solution were found to be soft and had decreased in size. Use the above information to answer the questions that follow:
 - i. Account for the firmness and increase in size of the potato cubes which were placed in water.
 - ii. Account for the softness and decrease in size of the potato cubes which were placed in sugar solution.
 - iii. Name and define the physical process being investigated in the experiment.
3. Explain why:

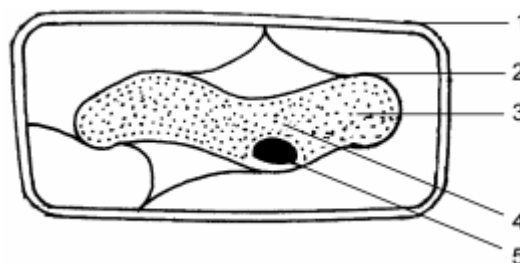
Root hairs become flaccid when too much chemical fertilizer is added to the moist soil around it
4. Name the following:
 - (i) The tissue through which the ascent of sap takes place in plants and plants lose water in the form of water droplets.
 - (ii) The condition of cell placed in a hypotonic solution.
 - (iii) The process by which water enters root hairs_____

- (iv) The process by which molecules evenly distribute themselves within the space they occupy_____
5. The leaves of a well-watered potted plant were found wilted during a hot sunny day
 - i. Suggest two reasons which could have caused the wilting of the leaves.
 - ii. Would the cells of the leaves in the wilted state be flaccid or turgid?
 - iii. Explain briefly the meaning of the term mentioned in your answer to (ii) above.
 - iv. What advantage would the plant have derived from wilting?
 - v. What explanation would you suggest if the wilted leaves did not recover even during the night?
 6. (i) Name one chemical substance which is transported from the roots to the shoot and one which is transported from the leaves to the lower parts of the plant.
 (ii) Suggest one simple experiment to show that water absorbed by the roots of a plant travels upward through the conducting tissues of the stem.
 7. Given below are diagrams of a certain structure in plants in two conditions.
 - i. Name the structure shown.
 - ii. Name the parts numbered 1-5.
 - iii. What is the most apparent difference between A and B in the structure shown?
 - iv. Describe the mechanism which brings about the change in the structure depicted in A and B.



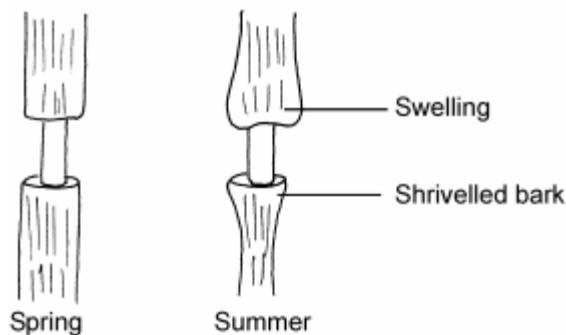
8. The following diagram represents a plant cell after being placed in a strong sugar solution.

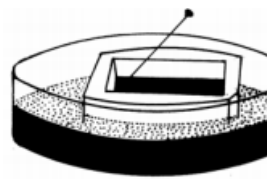
Guidelines 1 to 5 indicate the following:

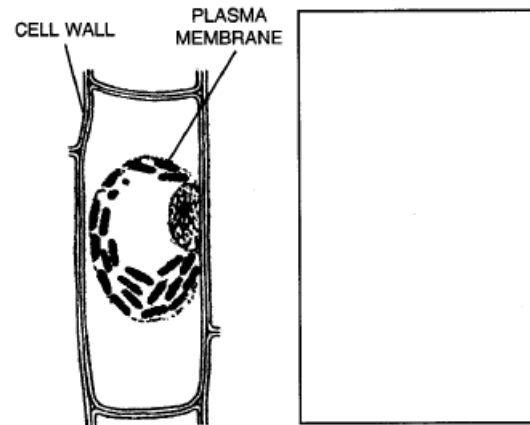


- (i) What is the state of cell shown in the diagram?
 - (ii) Name the structure which acts as a selectively permeable membrane.
 - (iii) If the cell had been placed in distilled water instead of strong sugar solution, which feature would not have been seen?
 - (iv) Name any one feature of this plant cell which is not present in animal cell.
9. A ring of bark was removed from a tree in spring. The tree continued to live through summer but a swelling appeared on the bark above the ring while the bark below shriveled up.

4



- (a) Account for the swelling in the bark above the ring.
 - (b) Account for the shriveling of the bark below the ring.
 - (c) Name the tissue through which food is conducted in plants.
 - (d) Name the tissue through which water is conducted in plants.
10. The skin of a raw potato was removed and slices were taken off from all sides giving it the shape of a square block. The centre was scooped out to form a cup. Strong sugar solution was put in the cup and the level of solution was marked by inserting a pin. The potato block was put in a dish containing water coloured with a drop of ink.
- 
- (i) What is the aim of the experiment?
 - (ii) What change would you expect in the cavity of the potato after one hour?
 - (iii) Give an explanation for this change.
 - (iv) If the raw potato is replaced by a boiled potato and treated in the same way, what difference would you note in the result?
 - (v) Give an explanation for this change.
11. A leaf cell of a water plant was placed in a liquid other than pond water. After some time is assumed a shape as shown below:

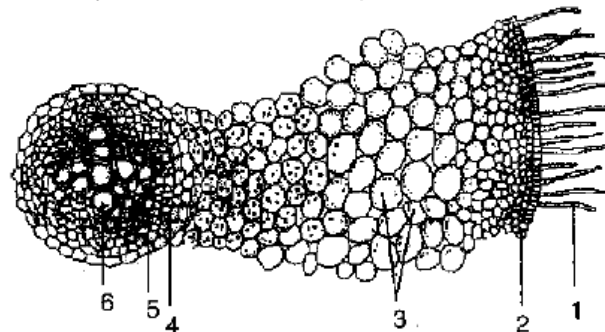


1. Give the term for the state of the cell it has acquired.
2. Comment on the nature (tonicity) of the liquid surrounding the cell.
3. Redraw in the space provided, the diagram of the cell if it is soon placed in ordinary water for some time.

12. Fill in the blanks by choosing the correct alternative from those given in brackets.

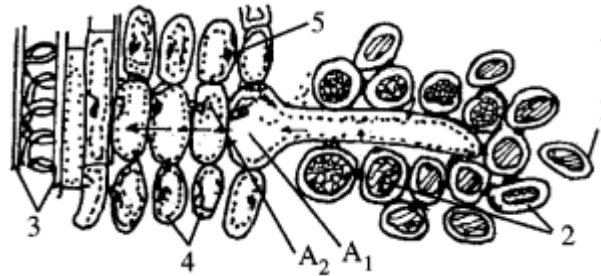
- i. When placed in more concentrated solution the cell contents will _____ (shrink/swell up)
- ii. The pressure by which the _____ molecules tend to cross the semi-permeable membrane is called osmotic pressure. (salt/water)
- iii. Active transport is in a direction _____ to that of diffusion. (Opposite/same).

13. Given below is the diagrammatic representation of the transverse section of a part of a plant. Study it and answer the question that follow:

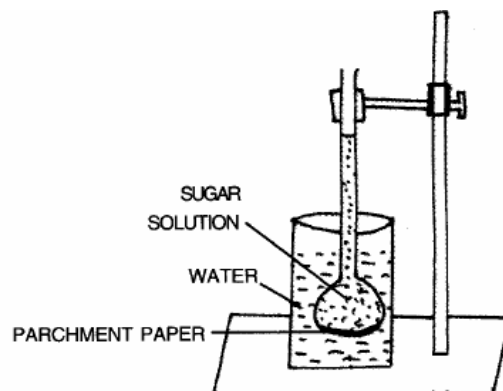


- i. Name the part of the plant that is shown.
- ii. Label the parts 1 to 6.
- iii. Write the functions of parts 3 and 5.

14. The figure given below is a diagrammatic representation of a part of the cross section of the root in the root hair zone. Study the same and answer the questions that follow:

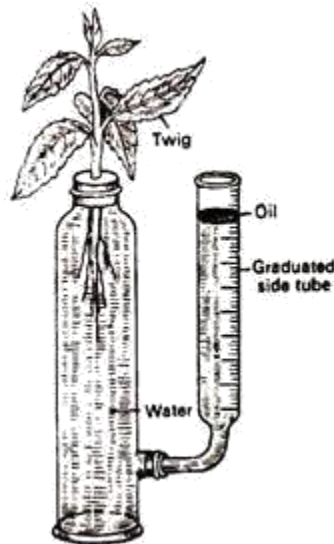


- Name the parts indicated by guidelines 1 to 5
 - Name the process responsible for the passage of water molecules from soil into A1 and then into A2
 - What pressure is responsible for the movement of water in the direction indicated by arrows?
 - How is this pressure set up?
15. Which one of the following is the most appropriate characteristic of a semi-permeable membrane?
- It has minute pores
 - It has no pores
 - It allows the solute to pass through but not the solvent.
 - It allows a solvent to pass through freely but prevents the passage of the solute.
16. The diagram given below represents an experimental set-up to demonstrate a certain process. Study the same and answer the questions that follow



1. Name the process.
 2. Define the above-named process.
 3. What would you observe in the experimental set-up after an hour or so?
 4. What control experiment can be set up for comparison?
-

17. Study the diagram given below and answer the questions that follow:



- a) Explain the physiological process being studied.
 - b) What will be observed in the two test-tubes after two to three days?
 - c) Give a reason for your answer in (ii) above.
 - d) Why is the surface of water covered with oil?
 - e) State the purpose of setting up test tube B
18. Tick-mark the correct option (out of the given four) in each case:
- (a) Which of the following is a characteristic NOT related with the suitability of the roots for absorbing water?
 - i. Tremendous surface area
 - ii. Contain cell sap at a higher concentration than the surrounding soil water
 - iii. Root hairs have thin cell walls
 - iv. Grow downward into the soil
 - (b) Movement of molecules of a substance from the region of higher concentration to their lower concentration without the involvement of a separating membrane is called

- (i) Osmosis
 - (ii) Diffusion
 - (iii) Active transport
 - (iv) Capillarity
- (c) Osmosis and capillarity are the same except that in osmosis there is
- (i) A freely permeable membrane
 - (ii) A cell wall in between
 - (iii) A selectively permeable membrane in between
 - (iv) An endless inflow of water into a cell
- (d) The highest water potential (capacity to move out to higher conc. solution) is that of
- (i) Pure water
 - (ii) 10% salt solution
 - (iii) Honey
 - (iv) 50% sugar solution
- (e) The space between the cell wall & plasma membrane in a plasmolysed cell is filled with
- (i) Isotonic solution
 - (ii) Hypotonic solution
 - (iii) Hypertonic solution
 - (iv) Water
- (f) What is responsible for guttation?
- (i) Osmotic pressure
 - (ii) Root pressure
 - (iii) Suction pressure
 - (iv) Capillarity

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