BIOLOGY

BOOKS - NCERT BIOLOGY (ENGLISH)

TRANSPORT IN PLANTS

Mcqs

1. Which of following statements does not apply to reverse osmosis?

A. It is used for water purification

B. In this technique, pressure greater than osmotic presure is applied to the system

C. It is a passive process

D. It is an active process

Answer:

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2. Which one of the following will not directly affect transpiration?

A. Temperature

B. Light

C. Wind speed

D. Chlorophyll content of leaves

Answer:

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3. The lower surface of leaf will have more number of stomata in a

A. dorsiventral leaf

B. isobilateral leaf

C. Both (a) and (b)

D. None of these

Answer:

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4. the form of sugar transported through phloem is

A. glucose

B. fructose

C. sucrose

D. ribose

Answer:

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5. The process of guttation takes place

A. when the root pressure is high and the rate of transpiration is low.

B. when the root pressure is low and the rate of transpiration is high.

C. when the root pressure equals the rate of transpiration.

D. when the root pressure as well as rate of transpiration are high.

Answer:

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6. Which of the following is an example of imbibition?

A. Uptake of water by root hair

B. Exchange of gases in stomata

C. Swelling of seed when put in soil

D. Opening of stomata

Answer:

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7. When a plant undergoes senescence, the nutrients may be

A. accumulated

B. bound to cell wall

C. translocated

D. None of these

Answer:

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8. Water potential of pure water at standard temperature is equal to

A. 10

B. 20

C. zero

D. None of these

Answer:

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9. Choose the correct option Mycorrhiza is a symbiotic association of fungus with root system which helps in

A. absorption of water

B. mineral nutrition

C. translocation

D.gaseous exchange.

A. absorption of water

B. mineral nutrition

C. translocation

D. gaseous exchange

Answer:

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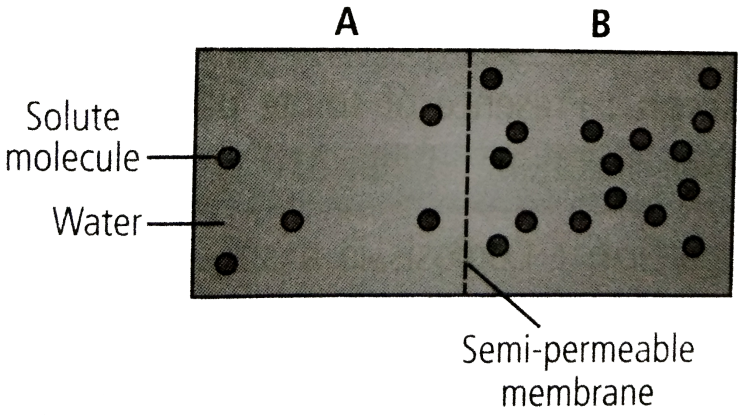
10. Based on the figure given below which of the following statements is not correct



A. Movement of solvent molecules will take place from chamber A to B

B. Movement of solute will take place from A to B

C. Presence of a semipermeable is a pre-requisite for this process to occur

D. The direction and rate of osmosis dpends on both the pressure gradient and concentration gradient

Answer:

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11. Match correctly the following and choose the correct option.

A.	Environment Protection Act	i.	1974
B.	Air Prevention & Control of Pollution Act	ii.	1987
C.	Water Act	iii.	1986
D.	Amendment of Air Act to include noise	iv.	1981

The correct matches is:

A. A-ii, B-iv, C-v, D-I

B. A-iii, B-iv, C-i, D-ii

C. A-I, B-ii, C-iii, D-iv

D. A-v, B-iv, C-iii, D-ii

Answer:

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12. Mark the mismatched pair.

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Very Short Answer Type Questions

1. Smaller, lipid soluble diffuse fater through cell membrane, but the movement of hyfrophilic substances is facilitated by certain transporters which are chemically

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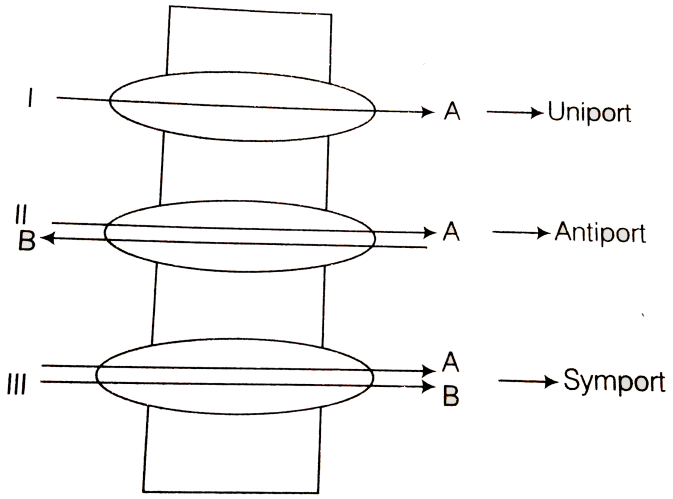
2. In a passive transport across a membrane. When two protein molecules move in opposite direction and independent of each other, it is called as ..... .



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3. Osmosis is a special kind of diffusion, through which water diffuses across the cell membrane the rate and direction of osmosis depends upon

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4. A flowering plant is planted in an earthen pot and irrigated. Urea is added in high amouts to make the plant grow faster but after same time the plant died. This may be due to _____

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5. Absorption of water from soil by seeds increases the _____ thus helping seedings to come out of soil.

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6. 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 _____

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7. The plant cell cytoplasm is surrounded by both cell wall and cell membrane. The specificty of transport of transport of substances is mostly across the cell membrane, because

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8. The C_4 plants are twice as efficient as C_3 plants in terms of fixing CO_2 but lose only ..... as much water C_3 plants for the same amount of CO_2 fixed.

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9. Movement of substances in xylem is unidirection while in phloem it is bidirectional. Explain

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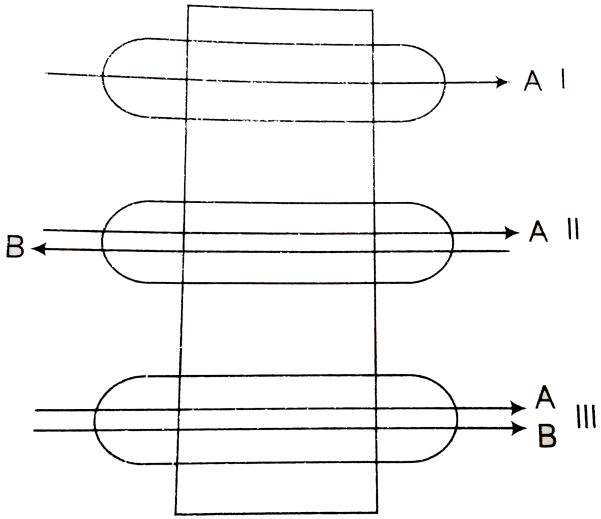
10. Indentify the process occurring in I, II, and III



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11. Given below is a table. Fill in the gaps.

Property	Simple Diffusion	Facilitated Transport	Active Transport
Highly selective	No	Yes	—
Uphill transport	—	—	Yes
Requires ATP	—	—	—

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12. Define water potential and solute potential.

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13. Why is solute potential always negative ? Explain $\Psi_w = \Psi_s + \Psi_p$.

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14. An onion peel was taken and

(a) placed in salt solution for five minutes.

(b) after that it was placed in distilled water.

when seen under the microscope what would be observed in (a) and (b) ?

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15. Differentiate apoplast and symplast pathways of water movement. Which of these would need active transport ?

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16. How does most of the water moves within the root ?

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17. Give the location of casparian strip and explain its role in the water movement.

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18. Differentiate between guttation and transpiration.

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19. Transpiration is a necessary evil in plants. Explain

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20. Describe briefly the three physical properties of water which helps in ascent of water in xylem.

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21. A gardener forgot to water a potted plant for a day during summer, what will happen to

the plant ? Do you think it is reversible ? If yes, how ?

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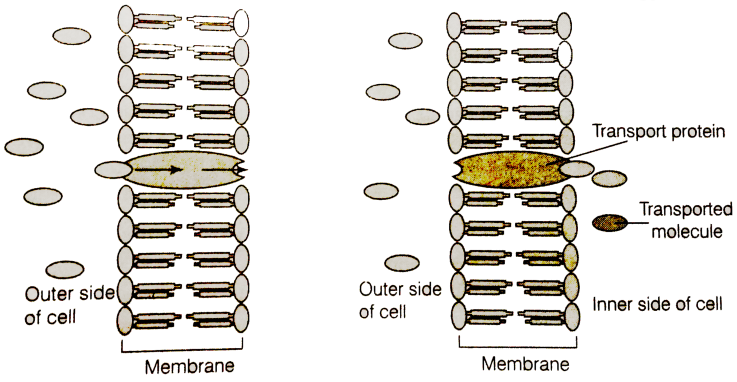
22. Identify a type of molecular movement which is highly selective and requires special membrane protenins, but does not require energy.



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23. Correct the statements.

(a) Cells shrink in hypotonic solutions and swell in hypertonic solutions.

(b) Imbibition is a special type of diffusion when water is absorbed by living cells.

(c) Most of the water flow in the roots occurs via the symplast.

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Short Answer Type Questions

1. Minerals absorbed by the roots travel up the xylem. How do they reach the parts where they are needed most ? Do all the parts of the plant get the same amount of the minerals ?

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2. If one wants to find minerals and in the form they are mobilised in the plant, how will an analysis of the exudate help ?

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3. From you kowledge of physiology can you think of some method of increasing the life of cut plants in a vase ?

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4. Do different species of plant a growing in the same area show the same rate of

tranpiration at a particular time ? Justify your answer.

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5. Water is indispensable for life. What properties of water make it useful for all biological on the earth ?

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6. How is it that the intracellular level of K^+ are higher than extracellular levels in animal cells ?

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7. Cut pieces of beetroot do not leave the colour in cold water but do so in hot water. Explain.

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8. In a girdled plant, when water is supplied to the leaves above the girdle, leaves may remain green for sometime then wilt and ultimately die. What does it indicate ?

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9. Varous types of transport mechanisms are needed to fulfil the mineral requirement of a plant. Why are they not fulfilled by diffusion alone?

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10. How can plants be grown in limited water supply without compromising on metabolic activities ?

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11. Will the ascent of sap be possible without the cohesion and adhesion of the water molecules ? Explain.

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12. Keep some freshly cut flowers in a solution of food colour. Wait for sometime for the days to rise in the flower, when the stem, of the flower is held up in light, coloured strands can be seen inside. Can this experiment demonstrate which tissue is conducting water up the stem ?

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13. When a freshly collected Spirogyra filament is kept in a 10 % potassium nitrate solution, it is observed that the protoplasm shrinks in size

(a) What is this phenomenon called ?

(b) What will happen if the filament is replaced in distilled water ?

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14. Sugar crystals do not dissolve easily in ice cold water. Explain.

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15. Salt is applied to tennis lawns to kill weeds. How does salting tennis lawns help in killing of weeds without affecting the grass ?

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16. What is the chemical composition of of xylem and phloem sap ?

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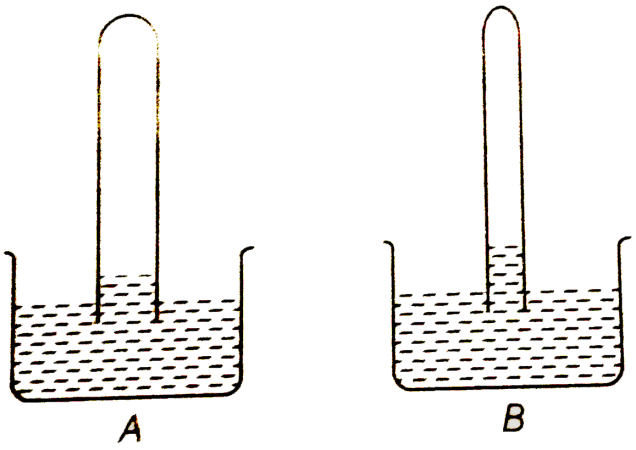
17. If you are provided with two tubes (A and B), where one is narrow and the other is relatively wider and if both are immersed in a beaker containing water as shown in the figure.



Why does B show higher water rise than A ?

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18. What are 'aquaporins' ? How does presence of aquaporins affect osmosis ?

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19. ABA (Abscisic Acid) is called a stress hormone.

A. How this hormone overcome stress conditions ?

B. From where where does this hormone get released in leaves ?

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20. We know that plants are harmed by excess water. But plants survive under flooded condition. How are they able to manage excess water ?

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21. Differentiate between diffusion and translocation in plants.

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22. How is fcilitated diffusion different from diffusion ?

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23. Explain the mass flow hypothesis of transport in phloem.

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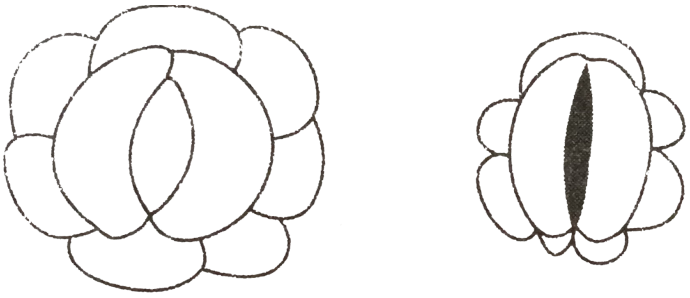
24. Observe the diagram and answer the following.



(i) (ii)

(a) Are these types of guard cells found in monocots or dicots ?

(b) Which of these shows a higher water content (i) or (ii) ?

(c) Which element plays an important role in the opening and closing of stomata ?

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25. Define uniport, symport and antiport. Do they require energy ?

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Long Answer Type Questions

1. Minerals are present in the soil in sufficient amounts. Do plants need to adjust the type of solutes that reach the xylem? Which molecules

help to adjust this? How do plants regulate the type and quantity of solutes that reach xylem ?

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2. Plants show temporary and permanent wilting. Differentiate between the two. Do any of them indicate the water status of the soil ?

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3. Which of these is a Semipermeable Membrane (SP) and which is Selectively Permeable (SL) ?

(a) Animal bladder (b) Plasmalemma (c) Tonoplast

(d) Parchment membrane (e) Egg membrane

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4. Halophytes may show precell pressure very much higher than atmospheric pressure.

Explain how this can happen ?

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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.

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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 in water.

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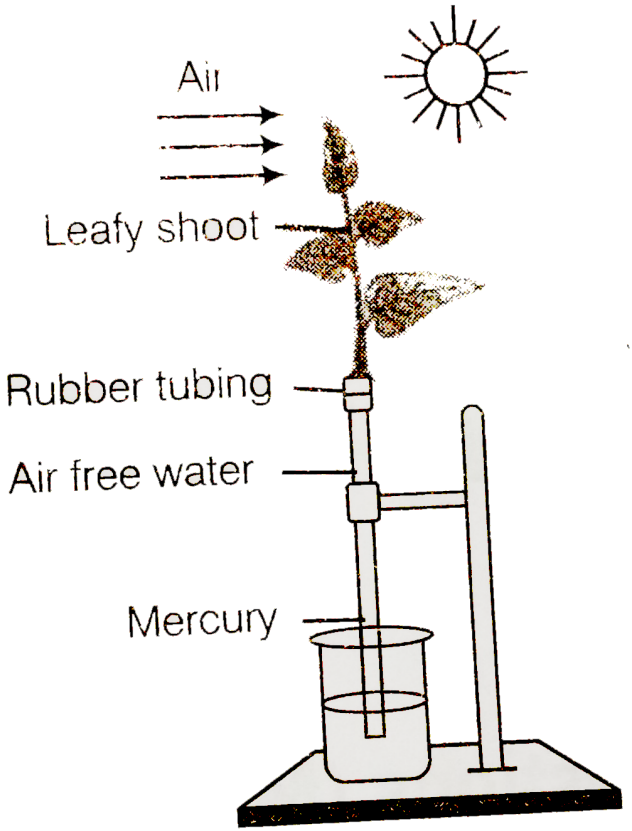
7. Comment on the experimental setup.



(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 ?

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