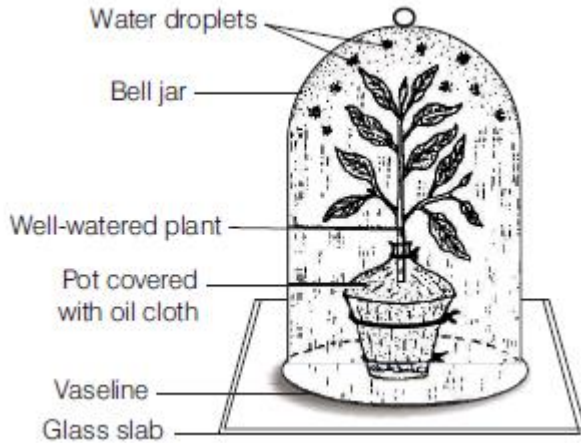
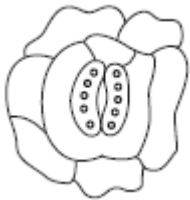


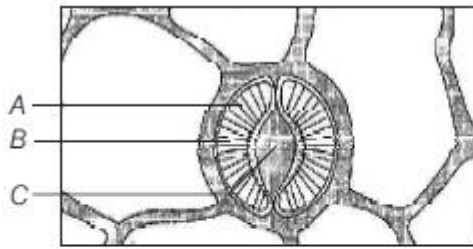
1. Transpiration is the loss of water from aerial parts of plants in the
 - (a) solid form
 - (b) liquid form
 - (c) vapour form
 - (d) Both (b) and (c)
2. Transpiration is important for plants as
 - (a) it creates transpiration pull for transport
 - (b) supplies water for photosynthesis
 - (c) maintains shape of plant
 - (d) All of the above
3. What is depicted by the diagram given below?



- (a) Measuring the rate of transpiration
 - (b) Demonstration of ascent of sap
 - (c) Demonstration of transpiration
 - (d) Both (a) and (c)
4. Cobalt chloride paper is used to study which phenomenon in plants?
 - (a) Osmosis
 - (b) Diffusion
 - (c) Transpiration
 - (d) Guttation
 5. The opening and closing of stomata is due to change in
 - (a) osmolarity
 - (b) turgidity
 - (c) transpiration
 - (d) None of these
 6. Which one gives the most valid and recent explanation for stomatal movements? **CBSE-AIPMT 2015**
 - (a) Transpiration
 - (b) Potassium influx and efflux
 - (c) Starch hydrolysis
 - (d) Guard cell photosynthesis
 7. The given figure of stomata demonstrates which condition?



- (a) Guard cell with higher water content
 - (b) Guard cell with lower water content
 - (c) Guard cell with no water content
 - (d) Guard cell with medium water content
8. If concentration of solute has decreased in guard cells, what change can be observed in it?
 - (a) Osmotic pressure increases
 - (b) Water potential increases
 - (c) Water potential decreases
 - (d) Both (b) and (c)
 9. Stomatal opening is affected by
 - (a) nitrogen concentration, carbon dioxide concentration and light
 - (b) carbon dioxide concentration, temperature and light
 - (c) nitrogen concentration, light and temperature
 - (d) carbon dioxide concentration, nitrogen concentration and temperature
 10. Choose the correct option for label A-C in the given diagram of stomatal apparatus.



- | | | |
|-----------------------|-----------------|------------------------|
| A | B | C |
| (a) Stomatal aperture | Subsidiary cell | Guard cell |
| (b) Microfibril | Guard cell | Stomatal aperture |
| (c) Stomatal aperture | Guard cell | Epidermal cell |
| (d) Stomatal aperture | Guard cell | Cellulosic microfibril |

11. Isobilateral leaf is an

- (a) amphistomatic leaf (b) monostomatic leaf
(c) bistomatic leaf (d) Both (b) and (c)

12. Which of the following factors is most important in the regulation of transpiration?

- (a) Light (b) Temperature
(c) Relative humidity (d) Wind speed

13. Transpiration and root pressure cause water to rise in plants by **CBSE-AIPMT 2015**

- (a) pulling it upward
(b) pulling and pushing it, respectively
(c) pushing it upward
(d) pushing and pulling it, respectively

14. Plants growing on hills are likely to show

- (a) higher rates of transpiration
(b) lower rates of transpiration
(c) same rate of transpiration as in plains
(d) lower rates of transpiration provided by the sunken stomata

15. Cohesion is

- (a) attraction between water and leaf surface
(b) attraction between water molecules
(c) attraction of water molecules to polar surfaces
(d) attraction of water molecules to non-polar surfaces

16. Adhesion is caused by

- (a) formation of hydrogen bond between water molecules
(b) transpiration pull
(c) higher surface tension
(d) attraction of water molecules to polar surface

17. Which theory is considered best to explain ascent of sap?

- (a) Bulk flow system (b) Transpiration pull
(c) Transpiration (d) Root pressure theory

18. Ascent of sap is

- (a) active and requires energy expenditure by the soil
(b) passive and no requirement of energy by the plants
(c) active and requires energy expenditure by the plants
(d) passive unless soil is dry

19. According to the transpiration-cohesion theory, the upward pull of water is transmitted to other water molecules by cohesion, which is caused by

- (a) hydrogen bond (b) hydrophilic cell walls
(c) turgor pressure (d) osmosis

20. No rupture and fraction occur in water column of vessels and tracheids during ascent of sap. It is due to

- (a) they are lignified thick walls
(b) they have weak gravitational pull
(c) cohesion and adhesion
(d) transpiration pull

21. Which one of the following does not play a major role in upward movement of xylem sap in tall trees?

- (a) Transpiration
(b) Tension

- (c) Cohesion and adhesion
- (d) Plasmodesmata

22. A student has taken a twig from a plant. She/he observes a droplet of fluid exuding from the cut surface of twig. What is this fluid?

- (a) Plant latex
- (b) Phloem sap
- (c) Xylem sap
- (d) Both (b) and (c)

23. The ability to resist a pulling force is

- (a) capillarity
- (b) cohesion
- (c) adhesion
- (d) tensile strength

24. Which is not the function of transpiration?

- (a) Cools leaf surface
- (b) Maintains shape and structure of plant
- (c) Helps in translocation of sugars from source to sink
- (d) Provides water for photosynthesis

25. A twig having fresh flower and buds is kept in minute amount of water containing salt. It remains fresh for a longer period due to

- (a) exosmosis
- (b) absorption of more water
- (c) electrolyte balance
- (d) decrease in transpiration rate

26. Exchange of substances between individual cells and their environments takes place by

- (a) Osmosis
- (b) Diffusion
- (c) Active transport
- (d) All of these

27. Which of the events is more rapid

- (a) Suction of water and minerals due to transpiration pull
- (b) Cyclosis in cell cytoplasm
- (c) Sugar transport in phloem
- (d) Distribution of hormones from one part to other

28. Young sieve tubes resemble

- (a) Mycoplasma
- (b) Slime body
- (c) Golgi body
- (d) None of these

29. Meaningful girdling (Ringing) experiments cannot be done on sugarcane because

- (a) Phloem is present inside the xylem
- (b) It can not tolerate the injury
- (c) Vascular bundles are scattered
- (d) Plants are very delicate

30. Some leaves are removed from the stem cuttings planted for vegetative propagation. This is done

- (a) To increase water uptake
- (b) Because it helps in rooting of cuttings
- (c) To reduce water loss
- (d) Because the cuttings need less food

1. (c)
2. (d)
3. (c) The diagram demonstrates the process of transpiration by bell jar experiment. In this experiment, a potted plant is placed on a slab and a dry bell jar is inverted over it. The edge of jar is sealed with wax or vaseline and the whole apparatus is left undisturbed. After sometime the inner surface of bell jar became misty due to transpiration by plant.
4. (c) Cobalt chloride paper is used to study the phenomenon of transpiration in plants. Dry cobalt chloride paper that is blue in colour turns pink when it comes in contact with water. Using this property of cobalt chloride paper we can demonstrate water loss during transpiration. We can measure the rate of transpiration by using the time taken for the paper to change its colour from blue to pink.
5. (b) The opening and closing of stomata is due to change in the turgidity of the guard cells.
6. (b)
7. (a)
8. (b) If the concentration of solute decreases in guard cells of stomata, the water potential will increase. This causes exosmosis, which in turn decreases the turgidity of guard cells. Thus, closing of stomata takes place.
9. (b) Stomatal opening can be affected by CO₂ concentration, light and temperature. Carbon dioxide is an effective antitranspirant. A little rise in CO₂ concentration induces partial closure of stomata. Its higher concentration results in complete closure of stomata. Light affects the rate of transpiration in two ways, firstly by controlling the stomatal opening and secondly by affecting the temperature. Increase in temperature increases the rate of transpiration.
10. (b)
11. (a) Amphistomatic leaves are those leaves which have stomata on both surfaces and isobilateral leaves have equal number of stomata on both surfaces. Thus, isobilateral leaf is an amphistomatic leaf.
12. (c) Relative humidity is most important in the regulation of transpiration. Rate of transpiration is inversely proportional to relative humidity.
13. (b) Transpiration causes water to rise in plants by pulling through xylem elements. Root pressure causes water to rise in plants by pushing water in xylem components. So, the rise of water in plants is done by pulling and pushing *via* transpiration and root pressure, respectively.
14. (a) Plants growing on hills show higher rates of transpiration because of low atmospheric pressure which permits more rapid diffusion of water.
15. (b)
16. (d) Adhesion is caused by attraction of water molecules to the polar surfaces. Movement of water inside the roots from soil to xylem and then in most of the plant parts takes place by transpiration forces, which provide both energy and necessary pull. Force between tracheary wall and water molecule produces surface tension, which accounts for high capillarity through tracheary elements, which is called as adhesion force. These forces help to ensure the continuity of water column in xylem.
17. (b) Transpiration pull theory is considered the best to explain ascent of sap. Excessive loss of water from the aerial parts of plants causes a tension in whole water column of the plant. As this tension develops due to transpiration, it is also called as transpirational pull.
18. (b) Ascent of sap is passive and occurs along the concentration gradient. Hence, there is no need of energy in this process.

19. (a) According to the transpiration pull or transpiration cohesion theory, the upward pull of water is transmitted to other water molecules by cohesion, which is caused by hydrogen bond. Water is a polar molecule and forms hydrogen bonds between the positively charged hydrogen atoms and negatively charged oxygen atom. Hydrogen bonds make water molecules stick together.
20. (c) No rupture and fraction occur in water column of vessels and tracheids during ascent of sap due to cohesion and adhesion. Conduction of water in vertical direction from root to aerial parts of the plant is known as ascent of sap. The molecules remain joined to each other in water column due to the force of cohesion. The force between the walls of tracheary elements and water molecule is called as adhesion force. These two forces ensure the continuity of water column in xylem.
21. (d) Plasmodesmata does not play a major role in upward water movement. These are bridge-like structures, which join adjacent cells in symplastic movement of water. While transpiration pull, tension and cohesion and adhesion of water molecule are those factors which play an important role in upward movement of xylem sap in plants.
22. (b) A newly detached twig from a plant exudates a fluid of organic food of plant like sugar from the detached part/cut part. The fluid is known as phloem sap.
23. (d)
24. (c) Option (c) is not the function of transpiration. This process plays an important role in the cooling effect by evaporating water, turgidity, which maintains the shape and structure of the plant, supplies water for photosynthesis, helps in absorption of water and mineral salts. But translocation of organic food like sugar from source to sink is not facilitated by transpiration.
25. (d) On addition of little salt into water, the gradient of water becomes more negative, which in turn decreases the rate of transpiration. Hence, the cut twig or flower remains fresh for a longer period.
26. D
27. (a) Because the water molecules have a great mutual attraction with each other or in other words they have tremendous cohesive power which is sometimes as much as 350 atmospheres.
28. B
29. (c) In monocot like sugarcane, maize, etc. due to absence of cambium secondary growth is not found. So removal of bark (phloem) is not possible so that ringing experiment is not possible.
30. (c) Because loss of water takes place through leaves by transpiration.