

Board –CBSE

Class –10th

Topic – Life Processes

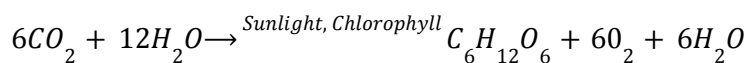
1. What are enzymes? Name any one enzyme of our digestive system and write its function.

Ans. Enzymes are biological catalysts. Catalysts are proteins that increase the rate of chemical reactions without being used up. For example, Amylase catalyzes the breakdown of starch into sugars (maltose) in the mouth and small intestine.

2. (i) Write the balanced chemical equation for the process of photosynthesis,

(ii) When do the desert plants take up carbon dioxide and perform photosynthesis?

Ans. (i) Photosynthesis can be represented using a chemical equation. The overall balanced equation is



(ii) Desert plants open up their stomata during the night and take in CO₂. Stomata remain close during the daytime to prevent the loss of water by transpiration. They store the CO₂ in their cells until the sun comes out and they can carry on with photosynthesis during the daytime.

3. In a single-celled organism's diffusion is sufficient to meet all their requirements of food, exchange of gases, or removal of wastes but it is not in the case of multicellular organisms. Explain the reason for this difference.

Ans. Unicellular organisms can absorb sufficient oxygen because of their complete contact with the atmosphere, but in multicellular organisms, the rate of absorption and diffusion becomes very less because all cells are not in direct contact with the atmosphere. Multicellular organisms require a greater amount of oxygen to sustain life processes which cannot be fulfilled by the process of diffusion.

4. State the role of the following in the human digestive system:

(i) Digestive enzymes (ii) Hydrochloric acid (iii) Villi

Ans. (i) Digestive enzymes – Foods need to be broken into their small or simpler molecules so that they can be absorbed into the bloodstream. However, the physical breakdown of food is not enough.

Enzymes are hence needed for the chemical breakdown of food and speeding up the digestive process. The products of digestion can hence be small enough to be absorbed by the bloodstream.

(ii) Hydrochloric acid – Hydrochloric acid helps to kill the germs which might have entered into the system through food. It creates an acidic medium for the pepsin to act on food to break down proteins.

(iii) Villi – Villi are finger-like projections in the small intestine. They help to increase the surface area for maximum absorption and digestion of the digested food. Villi are richly supplied with blood vessel which helps to absorb digested food into the bloodstream.

5. (a) Explain how the exchange of gases occurs in plants across the surface of stems, roots, and leaves. (b) How are water and minerals transported in plants?

Ans. (a) In plants, there are tiny pores called stomata on leaves and lenticels in the stem which facilitate the exchange of gases. Carbon dioxide is taken in and oxygen given out {during photosynthesis} and vice versa during respiration.

(b) Water and minerals are transported within the plant by the Xylem vessels (mainly in an upward direction); these are part of the vascular system.

6. Mention the raw materials required for photosynthesis.

Ans. The following raw materials are required for photosynthesis:

(i) Carbon Dioxide: Plants get CO₂ from the atmosphere through stomata.

(ii) Water: Plants absorb water from the soil through roots and transport it to leaves.

(iii) Sunlight: Sunlight, which is absorbed by the chlorophyll and other green parts of the plant.

7. Write a correct sequence of four steps of the method for the preparation of a temporary mount of a stained leaf peel.

Ans. Take a healthy leaf from the potted plant.

Remove a part of the peel from the lower surface of the leaf. You can do this by folding the leaf over and gently pulling the peel-apart using forceps. Keeps the peel in a watch glass containing water.

Put a few drops of safranin stain in a watch glass.

After 2-3 minutes take out the peel and place it on a clean glass slide.

Put a drop of glycerin over the peel and place a clean coverslip gently over it with the help of a needle. Remove the excess stain and glycerin with the help of blotting paper.

Observe the slide under magnifications of the compound microscope.

8. In mammals and birds why is it necessary to separate oxygenated and deoxygenated blood?

Ans. Mammals and birds are warm-blooded animals. This means they can control their body temperature and do not have to depend on the environment for their body temperature regulation. Because of this birds and mammals require optimum oxidization of glucose which would be possible with a good supply of oxygen. So it is required to have separate oxygenated and de-oxygenated blood to supply the required amount of oxygen.

9. List three characteristics of the lungs which make it an efficient respiratory surface.

Ans. These features particularly make our lungs efficient for gas exchange.

1. Thin: the air sac walls are very thin so that gases can quickly diffuse through them. Oxygen is absorbed into the blood and carbon dioxide is given out into the lungs to be exhaled out.
2. Moist: the air sacs are moist with mucus so that gases can dissolve before diffusing.
3. Large surface area: the surface area for gases to diffuse through in human lungs is roughly the same as a tennis court. The alveoli help to increase the surface area for the absorption of oxygen.
4. Good blood supply: the air sacs or the alveoli have a large capillary network so that large volumes of gases can be exchanged. More the flow of blood more exchange.

10. (a) What is the role of HCl in our stomach?

(b) What is the emulsification of fats?

(c) Which protein-digesting enzyme is present in pancreatic juice?

Ans. (a) (i) It sterilizes food by killing pathogens and other microbes.

(ii) It has a pH of 2, which is perfect for enzymes such as pepsin to break down proteins as effectively as possible.

(b) Breakdown of large fat globules into smaller fat droplets is known as emulsification.

(c) Trypsin is the enzyme secreted by the pancreas which aids in the digestion of proteins.

11. In the human alimentary canal, name the site of the complete digestion of various components of food. Explain the process of digestion.

Ans. In the small intestine, complete digestion of various components of food takes place. The process of digestion of food in the mouth, stomach, and small intestine in the human body are as follows:

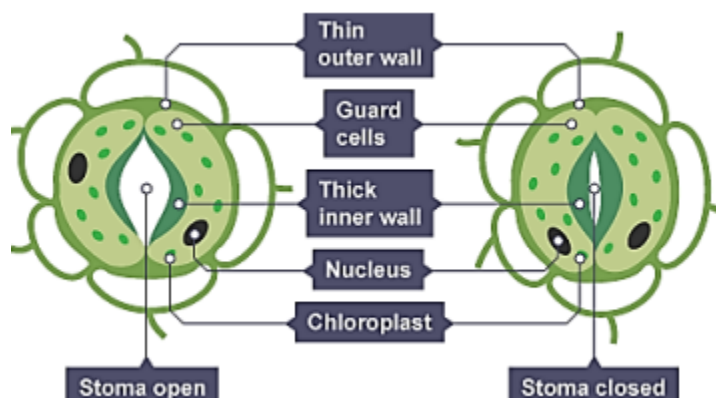
Mouth: Digestion of food begins in the mouth. Saliva present in the mouth contains a digestive enzyme, called salivary amylase, maltose, and dextrin, which breaks down starch into sugar.

(maltose) Stomach: Stomach stores and mixes the food received from the esophagus with gastric juices. The main components of gastric juice are hydrochloric acid, mucus, and pepsinogen. Hydrochloric acid dissolves bits of food and creates an acidic medium. In this medium, pepsinogen is converted to pepsin which is a protein-digesting enzyme. Mucus protects the inner lining of the stomach from the action of HCl.

Small Intestine: Small intestine is the site of the complete final digestion of carbohydrates, proteins, and fats. The small intestine produces intestinal juice from the glands present in its wall. The intestinal juice helps in further digestion of food. The small intestine also obtains digestive juices from the liver and pancreas. The liver produces bile juice that causes an emulsification of fats and the pancreas produces pancreatic juice for digesting proteins and emulsified fats. This digested food is finally absorbed through the villi of the intestinal walls.

- 12.** (a) Draw a diagram to show open stomata pore and label on it: (i) Guard cells (ii) Chloroplast
(b) State two functions of stomata.
(c) How do guard cells regulate the opening and closing of stomata pore?

Ans. (a)



(b) Two functions of stomata are:

- (i) Exchange of gases between the plant and the atmosphere takes place through stomata.

(ii) Transpiration in plants takes place through stomata.

(c) Opening and Closing of Stomatal Pore: The opening and closing of the pore is a function of the guard cells. The guard cells swell when water flows into them causing the stomatal pore to open. Similarly, the pore closes if the guard cells shrink due to loss of water. As a large amount of water is lost through these stomata, the plant closes these pores when it does not require carbon dioxide for photosynthesis.

13. (a) Draw a diagram of the human respiratory system and label the following:

(i) Part where the air is filtered by fine hair and mucus

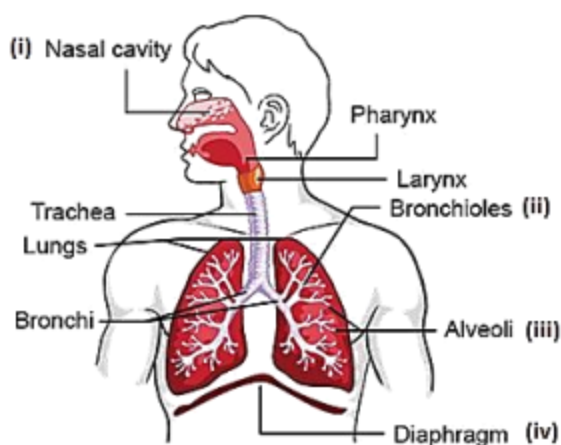
(ii) Part which terminates in balloon-like structures

(iii) Balloon-like structures where exchange of gases takes place.

(iv) Part which separates the chest cavity from the abdominal cavity.

(b) Why is the rate of breathing in aquatic organisms much faster than in terrestrial organisms?

Ans. (a)



(b) Quantity of dissolved oxygen is fairly low in the water as compared to the amount of oxygen in the air. Aquatic organisms, therefore, have to breathe faster than terrestrial organisms to absorb the required amount of oxygen from the water.

14. Draw a neat diagram of the excretory system of human beings and label the following:

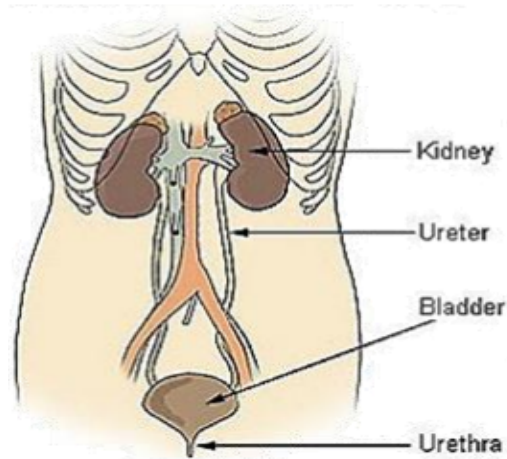
(i) Kidney

(ii) Ureter

(iii) Urinary Bladder

(iv) Urethra

Ans.



15. What are the final products after digestion of carbohydrates and proteins?

Ans. The final product produced after the digestion of carbohydrates is glucose and proteins are amino acids.

16. What is saliva? State its role in the digestion of food.

Ans. Saliva is a watery fluid secreted by the salivary glands in the mouth. The digestive functions of saliva include moistening food, and helping to create a food bolus, so it can be swallowed easily. Saliva contains the enzyme salivary amylase that breaks down starch into maltose