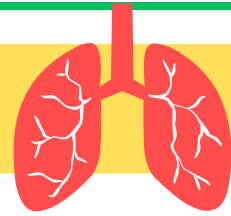


• Life Process:



1. (a) What is double circulation?
(b) Why is the separation of the right side and the left side of the heart useful? How does it help birds and mammals?
(CBSE 2023, 2022, 2019)
2. Explain the ways in which glucose is broken down in the absence or storage of oxygen?
(CBSE 2017, 2018, 2019)
3. (a) Write two water-conducting tissues present in plants. How does water enter continuously into the root xylem?
(b) Explain why plants have low energy needs as compared to animals.
(CBSE 2017, 2019, 2021)
4. In single-celled organisms, diffusion is sufficient to meet all their requirements for food, gas exchange, or removal of waste, but it is not in the case of multicellular organisms. Explain the reason for the difference.
(CBSE 2015, 2019, 2022)
5. Draw a diagram of the human alimentary canal and label the following:
(CBSE 2016, 2019, 2020)
 - (1) part in which starch digestion is initiated
 - (2) organ in which bile is stored
 - (3) the gland that secretes digestive enzymes as well as hormones.
 - (4) Part of the alimentary canal where water is reabsorbed.
 - (5) Parts of the gut where finger-like² projections are present to facilitate absorption of digested food.

Solutions

- (a) Double circulation is the circulation of blood through the heart twice during one complete cycle of the body. It is a type of circulation in which the blood passes through two different circuits of the body, namely, pulmonary circulation and systemic circulation.

(b) The separation of the right side and the left side of the heart is useful as it allows the oxygenated and deoxygenated blood to remain separate, which helps in maintaining the oxygen concentration in the body. In mammals and birds, the separation of the heart into four chambers helps to increase the efficiency of oxygen delivery to the body tissues. The right side of the heart receives the deoxygenated blood from the body and pumps it to the lungs for oxygenation. The left side of the heart receives the oxygenated blood from the lungs and pumps it to the rest of the body. This separation ensures that the oxygen-rich and oxygen-poor blood do not mix, and the oxygenated blood is delivered efficiently to the body tissues
- The anaerobic breakdown of glucose occurs in two different ways. The first stage in both processes is the cytoplasmic breakdown of the glucose molecule into pyruvate. Fermentation is the term for the anaerobic breakdown process in bacteria. Pyruvate is converted to carbon dioxide and ethyl alcohol during fermentation. Pyruvate is converted to lactic acid in our muscle cells when there is a shortage of oxygen. Note: In the two scenarios mentioned above, very little energy is emitted.
- (a) Xylem tracheids and xylem vessels are water-conducting tissues (vascular tissue) as part of the xylem present in plants. Xylem is responsible for the conduction of water from the roots to other parts of the plant. Due to transpiration and the resulting pressure gradient, water is absorbed into the root xylem of plants. The transpirational pull formed causes the roots to absorb water from the soil and resulting in the transportation of water.

(b) Plants have low energy needs as compared to animals due to the following reasons:

(i) Plants are autotrophic organisms, preparing their own food absorbing solar energy during the process of photosynthesis.

(ii) Plants don't move from one place to another like animals so they consume less energy.

(iii) Also, plants possess many dead cells in terms of sclerenchyma cells that do not require much energy for maintenance.

4. The surface area to volume ratio in unicellular organisms is ideal for material exchange or diffusion between the cell and its external environment, and this rate of exchange meets the needs of the unicellular organism. However, the surface area to volume ratio is low in multicellular organisms, and the only way for an organism to exchange with the outside world is through its surface, assisted by a particular structure or organ, such as the skin. Nevertheless, this exchange is insufficient to make up for the millions of cells that make up a multicellular organism, each of which has unique needs depending on its function.

5. (1) Mouth
(2) Gall bladder
(3) Pancreas
(4) Large intestine
(5) Small intestine.

