SCIENCE : Life Processes

27. What are the necessary conditions for autotrophic nutrition, and what are its byproducts?

Ans Autotrophic nutrition takes place through the process of photosynthesis. Carbon dioxide, water, chlorophyll pigment and sunlight are the necessary conditions required for autotrophic nutrition. Carbohydrates (food) and O_2 are the by-products of photosynthesis

28. (a) What are the differences between aerobic and anaerobic respiration?

(b) Name some organisms that use the anaerobic mode of respiration.

Ans(a): Aerobic respiration

(i) The process takes place in the presence of free oxygen.

(ii) The products of aerobic respiration are CO_2, water and energy.

(iii)The first step of aerobic respiration (glycolysis) takes place in the cytoplasm, while the next step takes place in mitochondria.

(iv) In this process, complete oxidation of glucose takes place.

Anaerobic respiration

(i) The process takes place in the absence of free oxygen.

(ii) The products of anaerobic respiration are ethyl alcohol, CO_2 and a little energy.

(iii) Even in anaerobic respiration, the first step takes place in the cytoplasm, while the next step takes place in mitochondria.

(iv) In this process, the glucose molecules are incompletely broken down.

Ans(b):- The process of anaerobic respiration takes place in lower organisms like yeast, some species of bacteria and parasites like tapeworms.

29. How are the alveoli designed to maximise the exchange of gases?

Ans: The lung is an important part of the body. The passage inside the lungs divides into smaller and smaller tubes, which finally terminate in balloon-like structures called alveoli.

* The alveoli provide a surface where the exchange of gases can take place. The walls of the alveoli usually contain an extensive network of blood vessels. We know that when we breathe in, we lift our ribs, flatten our diaphragm and the chest cavity becomes larger. Because of this action, the air is sucked into the lungs and fills up the expanded alveoli.

The blood brings the essential carbon dioxide from the rest of the body and supplies it to the alveoli; the oxygen in the alveolar air is taken up by the blood in the alveolar blood vessels to be transported to all other cells of the body. During the normal breathing cycle, when air is taken in and let out, the lungs always contain a residual volume of air so that there is sufficient time for oxygen to be absorbed and carbon dioxide to be released.

30. What would be the consequences of a deficiency of haemoglobin in our bodies?

Ans: Haemoglobin is a protein responsible for the transportation of oxygen to the body cells for cellular respiration. A deficiency of Haemoglobin can affect the oxygen-carrying capacity of RBCs. This lead to a lack of oxygen in our body cells. Haemoglobin deficiency leads to a disease called anaemia.

31. Describe the double circulation of blood in human beings. Why is it necessary?

Ans: Double circulation means, in a single cycle, blood goes twice in the heart. The process helps in separating oxygenated and deoxygenated blood to maintain a constant body temperature.

The double circulatory system of blood includes

* Pulmonary circulation
* Systemic circulation.

Pulmonary circulation

The right ventricle pumps deoxygenated blood into the lungs, where it is oxygenated. The oxygenated blood is brought back to the left atrium, and from there, it is pumped into the left ventricle. Finally, blood goes into the aorta for systemic circulation.

Systemic circulation

The oxygenated blood is pumped to various parts of the body from the left ventricle. The deoxygenated blood from different parts of the body passes through the vena cava to reach the right atrium. The right atrium transfers the blood into the right ventricle.

32. What are the methods used by plants to get rid of excretory products?

Ans: Plants don't have specialized excretory organs, so they use several methods to remove waste:

Transpiration: Excess water is exhaled as water vapor through stomata.

Stomata and lenticels: Gaseous wastes like carbon dioxide and oxygen are removed through stomata in leaves and lenticels in stems.

Falling leaves and fruits: Solid and liquid wastes are removed by shedding leaves, peeling bark, and felling fruits.

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