

Board – CBSE

Class – 10th

Topic – Life Processes

1. The kidneys in human beings are a part of the system for

- (a) Nutrition.
- (b) Respiration.
- (c) Excretion.
- (d) Transportation.

Ans. (c) In human beings, the kidneys are a part of the system for excretion.

2. The xylem in plants are responsible for

- (a) Transport of water.
- (b) Transport of food.
- (c) Transport of amino acids.
- (d) Transport of oxygen.

Ans. (a) In a plant, the xylem is responsible for the transport of water.

3. The autotrophic mode of nutrition requires

- (a) Carbon dioxide and water.
- (b) Chlorophyll.
- (c) Sunlight.
- (d) All of the above

Ans. (d) The autotrophic mode of nutrition requires carbon dioxide, water, chlorophyll, and sunlight.

4. The breakdown of pyruvate to give carbon dioxide, water and energy takes place in

- (a) Cytoplasm.
- (b) Mitochondria.
- (c) Chloroplast.
- (d) Nucleus.

Ans. (b) The breakdown of pyruvate to give carbon dioxide, water, and energy takes place in mitochondria.

5. How are fats digested in our bodies? Where does this process take place?

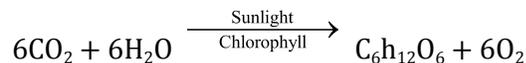
Ans. Fats are present in the form of large globules in the small intestine. The small intestine gets the secretions in the form of bile juice and pancreatic juice respectively from the liver and the pancreas. The bile salts (from the liver) break down the large fat globules into smaller globules so that the pancreatic enzymes can easily act on them. This is referred to as the emulsification of fats. It takes place in the small intestine.

6. What is the role of saliva in the digestion of food?

Ans. Saliva is secreted by the salivary glands, located under the tongue. It moistens the food for easy swallowing. It contains a digestive enzyme called salivary amylase, which breaks down starch into sugar.

7. What are the necessary conditions for autotrophic nutrition and what are its by-products?

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.



8. What are the differences between aerobic and anaerobic respiration? Name some organisms that use the anaerobic mode of respiration.

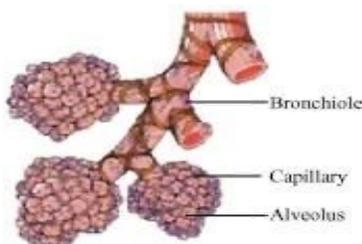
Ans.

	Aerobic respiration		Anaerobic respiration
1.	It occurs in the presence of O_2 .	1.	It occurs in the absence of O_2 .
2.	It involves the exchange of gases between the organism and the outside environment.	2.	The exchange of gases is absent.
3.	It occurs in the cytoplasm and mitochondria.	3.	It occurs only in the cytoplasm
4.	It always releases CO_2 and H_2O .	4.	End products vary.
5.	It yields 36 ATPs.	5.	It yields only 2 ATPs.

Anaerobic respiration occurs in the roots of some waterlogged plants, some parasitic worms, animal muscles, and some micro-organisms such as yeasts.

9. How are the alveoli designed to maximize the exchange of gases?

Ans. The alveoli are the small balloon-like structures present in the lungs. The walls of the alveoli consist of an extensive network of blood vessels. Each lung contains 300–350 million alveoli, making it a total of approximately 700 million in both lungs. The alveolar surface when spread out covers about $80\ m^2$ the gaseous exchange area. This large surface area makes more efficient.



Alveoli and capillaries

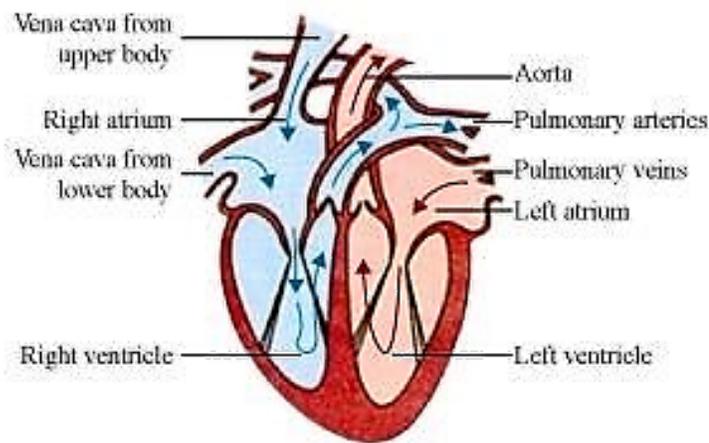
10. What would be the consequences of a deficiency of haemoglobin in our bodies?

Ans. Haemoglobin is the respiratory pigment that transports oxygen to the body cells for cellular respiration. Therefore, deficiency of haemoglobin in the blood can affect the oxygen supplying capacity of the blood. This can lead to a deficiency of oxygen in the body cells. It can also lead to a disease called anaemia.

11. Describe double circulation in human beings. Why is it necessary?

Ans. The human heart is divided into four chambers – the right atrium, the right ventricle, the left atrium, and the left ventricle.

The flow of blood in the heart.

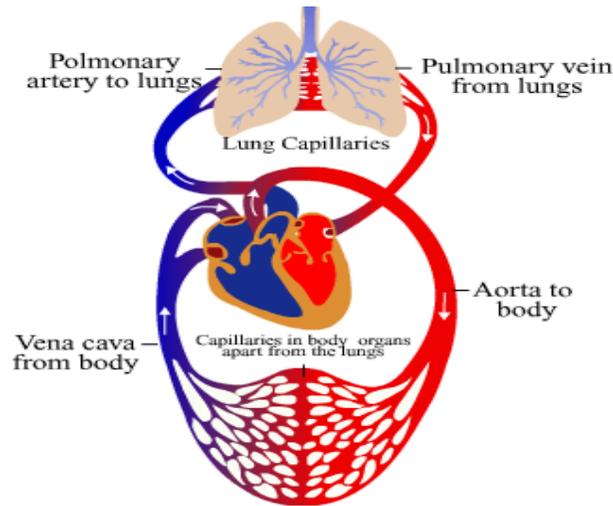


- The heart has superior and inferior vena cava, which carries de-oxygenated blood from the upper and lower regions of the body respectively and supplies this deoxygenated blood to the right atrium of the heart.

The flow of blood in the human heart

- The right atrium then contracts and passes the de-oxygenated blood to the right ventricle, through an auriculo-ventricular aperture.
- Then the right ventricle contracts and passes the de-oxygenated blood into the two pulmonary arteries, which pumps it to the lungs where the blood becomes oxygenated. From the lungs, the pulmonary veins transport the oxygenated blood to the left atrium of the heart.

- Then the left atrium contracts and through the auriculo-ventricular aperture, the oxygenated blood enters the left ventricle.
- The blood passes to the aorta from the left ventricle. The aorta gives rise to many arteries that distribute the oxygenated blood to all the regions of the body.



Schematic diagram of blood circulation in humans

Therefore, the blood goes twice through the heart. This is known as double circulation.

Importance of double circulation.

The separation of oxygenated and de-oxygenated blood allows a more efficient supply of oxygen to the body cells. This efficient system of oxygen supply is very useful in warm-blooded animals such as human beings.

As we know, warm-blooded animals have to maintain a constant body temperature by cooling themselves when they are in a hotter environment and by warming their bodies when they are in a cooler environment. Hence, they require more O_2 for more respiration so that they can produce more energy to maintain their body temperature. Thus, the circulatory system of humans is more efficient because of the double circulatory heart.

12. What are the differences between the transport of materials in the xylem and phloem?

Ans.

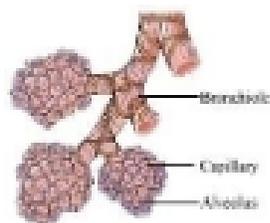
	Transport of materials in xylem		Transport of materials in phloem
(i)	Xylem tissue helps in the transport of water and minerals.	(i)	Phloem tissue helps in the transport of food.
(ii)	Water is transported upwards from roots to all other plant parts.	(ii)	Food is transported in both upward and downward directions.
(iii)	Transport in the xylem occurs with the help of simple physical forces such as transpiration pull.	(iii)	Transport of food in phloem requires energy in the form of ATP.

13. Compare the functioning of alveoli in the lungs and nephrons in the kidneys with respect to their structure and functioning.

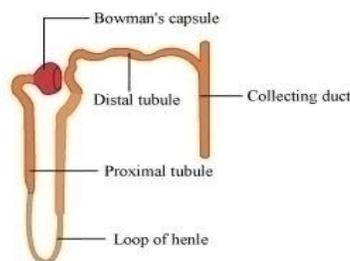
Ans.

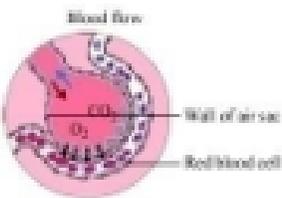
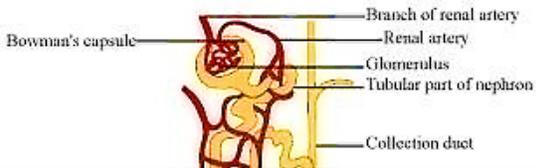
Alveoli	Nephron
Structure	Structure
(i) Alveoli are tiny balloon-like structures present inside the lungs	(i) Nephrons are tubular structures present inside the kidneys.

(ii) The walls of the alveoli are one cell thick and it contains an extensive network of blood capillaries.



(ii) Nephrons are made of glomerulus, bowman's capsule, and a long renal tube. It also contains a cluster of thin-walled capillaries.



Function	Function
<p>(i) The exchange of O_2 and CO_2 takes place between the blood of the capillaries that surround the alveoli and the gases present in the alveoli.</p>  <p>A diagram showing a cross-section of an alveolus. Labels include: Blood flow, Wall of air sac, CO_2, O_2, and Red blood cell. It illustrates the exchange of gases between the blood and the air sac.</p>	<p>(i) The blood enters the kidneys through the renal artery which branches into many capillaries in the glomerulus. The water and solute are transferred to the nephron at Bowman's capsule. Then the filtrate moves through the proximal tubule and then down into the loop of Henle. From Henle's loop, filtrate passes into the distal tubule and then to the collecting duct. The collecting duct collects the urine from many nephrons and passes it to the ureter. During the flow of filtrate, some substances such as glucose, amino acids, and water are selectively re-absorbed.</p>  <p>A diagram showing a nephron connected to a renal artery and a collecting duct. Labels include: Bowman's capsule, Branch of renal artery, Renal artery, Glomerulus, Tubular part of nephron, and Collection duct. The renal artery branches into a glomerulus, which is surrounded by Bowman's capsule. The filtrate then moves through the tubular part of the nephron, including the loop of Henle, and is collected by the collecting duct.</p>

(ii) Alveoli are the site of gaseous exchange.	(ii) Nephrons are the basic filtration unit.