

SCIENCE

CLASS 10 CHAPTER 6 – LIFE PROCESSES Important questions WITH ANSWERS

CLASS 10

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1. Most of the digestion and absorption of the food takes place in the

Ans: small intestine.

2. Mention the raw materials required for photosynthesis.

Answer: Raw materials required for photosynthesis are carbon dioxide (CO₂), water, light and chloroplast.

3. State the location and function of gastric glands.

Answer: Gastric glands are present in the wall of the stomach. They secrete gastric juices containing mucus, protein digesting enzymes pepsin, rennin and hydrochloric acid (HCl).

4. Name the glands present in the wall of the stomach that release secretions for digestion of food. Write the three components of secretion that are released by these glands.

Answer: Stomach's muscular wall contains gastric glands. These glands secrete gastric juices which contain dilute hydrochloric acid, mucus and two protein digesting enzymes rennin and pepsin.

5. (a) State the role played by the following in the process of digestion :

(i) Enzyme trypsin

(ii) Enzyme lipase-

(b) List two functions of finger-like projections present in the small intestine.

Answer: (a) (i) Enzyme trypsin : This enzyme is produced by the pancreas in an inactive form called trypsinogen. Trypsin converts remaining proteins into peptones and the peptones into peptides and amino acids.

(ii) Enzyme lipase : It is secreted by pancreas and small intestine. Lipase converts fats into fatty acids and glycerol.

(b) Internally, the wall of the small intestine is provided with long finger-like projections called villi. Two functions of villi are :

(i) The villi greatly increase the absorptive surface area of the inner lining of small intestine.

(ii) The large surface area of small intestine helps in rapid absorption of digested food.

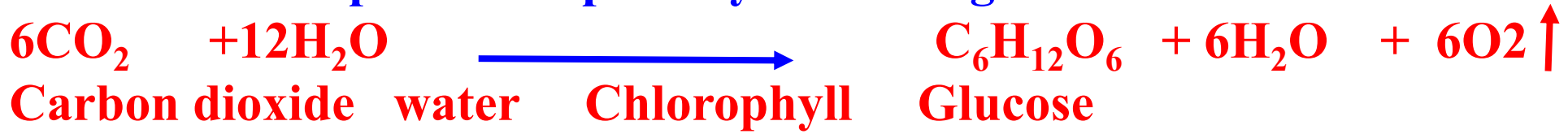
6.Explain the significance of photosynthesis. Write the balanced chemical equation involved in the process.

Answer: Photosynthesis is important for a number of reasons:

(i) Food : By photosynthesis, green plants synthesise food from simple raw materials like CO_2 and H_2O . Thus, it sustains life on earth.

(ii) Oxygen : Oxygen released during the process of photosynthesis is needed by animals and humans for respiration. It is also required for respiration of microbes. Oxygen also supports combustion of fuels.

iii) Fuels : Fossil fuels like coal, oil and natural gas are forms of stored solar energy synthesised millions of years ago through photosynthesis. Balanced chemical equation involved in the process of photosynthesis is given as :



7. Differentiate between autotrophs and heterotrophs and give one example of each.

Answer:

Differences between autotrophs and heterotrophs are as follows:

Autotrophs

Heterotrophs

(i) These organisms are able to form organic substances from simple inorganic substances such as CO₂ and H₂S and water.

They cannot produce organic compounds from inorganic sources and therefore completely rely on consuming other organisms for its food requirement.

(ii) They have chlorophyll to trap solar energy.

Chlorophyll is absent, so they cannot trap solar energy.

(iii) They can be chemoautotroph and photoautotroph.

They can be saprophytic, parasitic and holozoic in mode of nutrition.

(iv) Autotrophs are placed at the bottom of the food chain as producers.

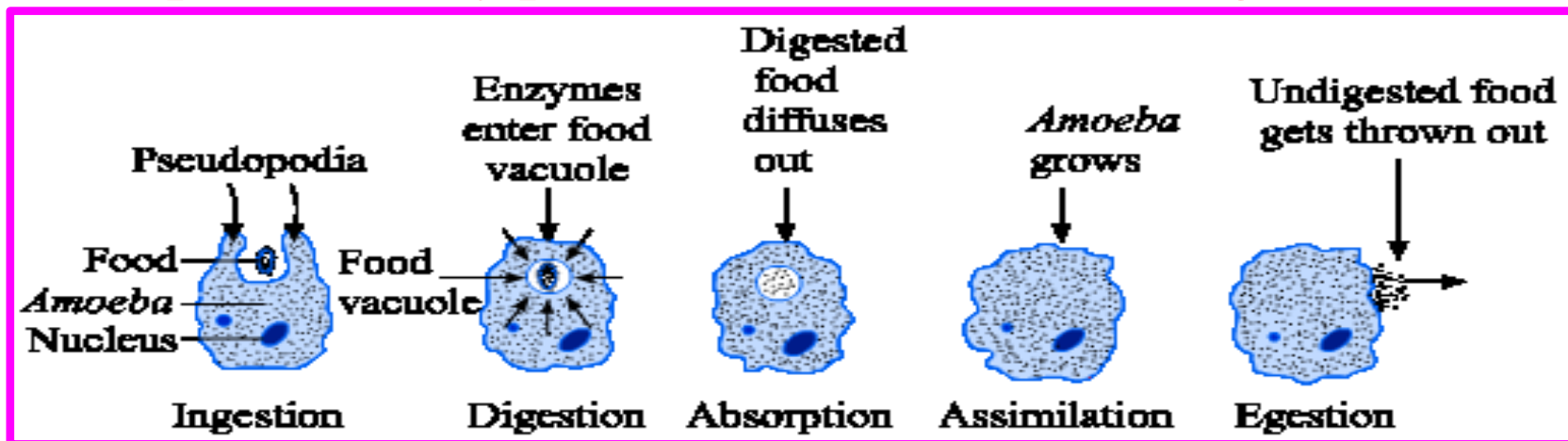
Heterotrophs are placed above autotrophs in the food chain as consumers.

8. Explain with the help of neat and well labelled diagrams the different steps involved in nutrition in Amoeba. (Board Term I, 2015)

Answer:

The mode of nutrition in Amoeba is holozoic. The process of obtaining food by Amoeba is called phagocytosis.

- 1. Amoeba ingests food by using its finger-like projections called pseudopodia.**
- 2. The food is engulfed with a little surrounding water to form a food vacuole inside the Amoeba. The food is digested inside food vacuole by digestive enzymes.**
- 3. Food is absorbed directly into the cytoplasm of Amoeba by diffusion.**
- 4. Food is used to obtain energy and growth of Amoeba.**
- 5. When considerable amount of undigested food collects inside Amoeba then its cell membrane ruptures at any place to throw out this undigested food.**



9. (a) What is peristaltic movement?

(b) 'Stomata remain closed in desert plants during daytime'. How do they do photosynthesis?

Answer: (a) The relaxation of gut muscles to move the partially digested food downwards throughout the alimentary canal is called peristaltic movement.

(b) In desert plants, stomata open at night and take in carbon dioxide (CO₂). Stomata remain closed during daytime to prevent the loss of water by transpiration. They store the CO₂ in their cells until the sun comes out so that they can carry on with photosynthesis during the daytime.

10. a) Why is nutrition necessary for the human body?

(b) What causes movement of food inside the alimentary canal?

(c) Why is small intestine in herbivores longer than in carnivores?

(d) What will happen if mucus is not secreted by the gastric glands?

Answer: (a) Human body continuously require energy for their life activities like respiration, circulation, excretion, etc. Energy is required even we are sleeping because a number of biological processes keep on occurring. All these processes require energy and this energy is obtained from nutrition. Nutrition is also needed for growth and repair of human body.

(b) The wall of alimentary tract contains muscles which can contract and expand alternately. The contraction and expansion movement of the walls of foodpipe is called peristaltic movement. The peristaltic movement moves the partially digested food in all the digestive organs throughout the alimentary canal.

(c) Herbivores eat plants which is rich in cellulose. Cellulose takes longer time for complete digestion by the enzymes present in symbiotic bacteria. Therefore, they have longer small intestine. Carnivores, feed on flesh which is easier to digest and do not contain cellulose also. Therefore, they have shorter intestine for digestion of food eaten by them.

(d) Gastric glands secrete HCl, mucus, rennin and pepsin enzymes. Mucus protects the inner lining of stomach from the action of HCl and enzymes. In the absence of mucus, there would be erosion of inner lining of stomach leading to acidity and ulcers.

11. (a) State the form in which the following are stored:

(i) Unused carbohydrates in plants.

(ii) The energy derived from food in humans,

Answer:

Answer:(a) (i) Unused carbohydrates in plants are stored in the form of complex sugar known as starch. They are later broken down into simple sugars (glucose) when energy is needed.

(ii) The assimilated food molecules hold energy in their chemical bonds. Their bond energy is released by oxidation in the cell. This energy is trapped by forming bonds between ADP (adenosine diphosphate) and inorganic phosphate (Pi) to synthesise ATP (Adenosine triphosphate) molecules. These bonds are later broken by enzymatic hydrolysis and the energy released is utilised for cellular processes.

12. Anaerobic process

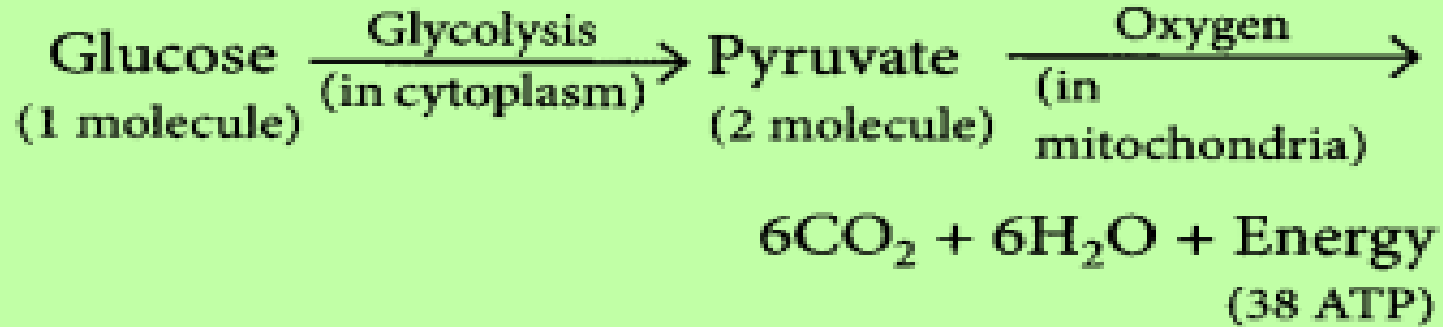
Answer: (a) takes place in yeast during fermentation.

13. Diffusion is insufficient to meet the oxygen requirement of multicellular organisms like human. State reason.

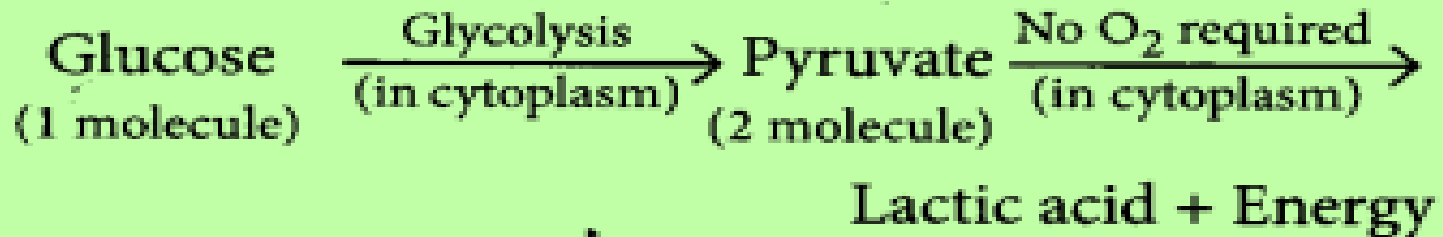
Answer: Due to higher metabolic rate and the volume of human body is so large that oxygen cannot diffuse into all cells of the body quickly as oxygen will have to travel large distances to reach each and every cell. So diffusion is insufficient to meet the oxygen demand of multicellular organisms.

14. Write two different ways in which glucose is oxidised to provide energy in human body. Write the products formed in each case.

Ans: The two different ways by which glucose is oxidised to provide energy in human body are:(i) **Aerobic respiration** : The end products in aerobic respiration are carbon dioxide, water and energy.



(ii) **Anaerobic respiration** : The end products are lactic acid and energy.



15. (a) In the process of respiration, state the function of alveoli.

(b) Rate of breathing in aquatic organisms is much faster than that in terrestrial organisms. Give reasons.

Answer: (a) Functions of alveoli are :

(i) They increase the surface area for exchange of gases.

(ii) The thin walls of alveoli facilitate rapid exchange of oxygen and carbon dioxide between alveolar air and blood.

(b) Aquatic animals like fishes obtain oxygen from water present in the dissolved form through their gills. The amount of dissolved oxygen is quite small as compared to the amount of oxygen in the air. Therefore, to obtain required oxygen from water, aquatic animals have to breathe much faster than the terrestrial organisms.

16. Write three points of difference between breathing and respiration.

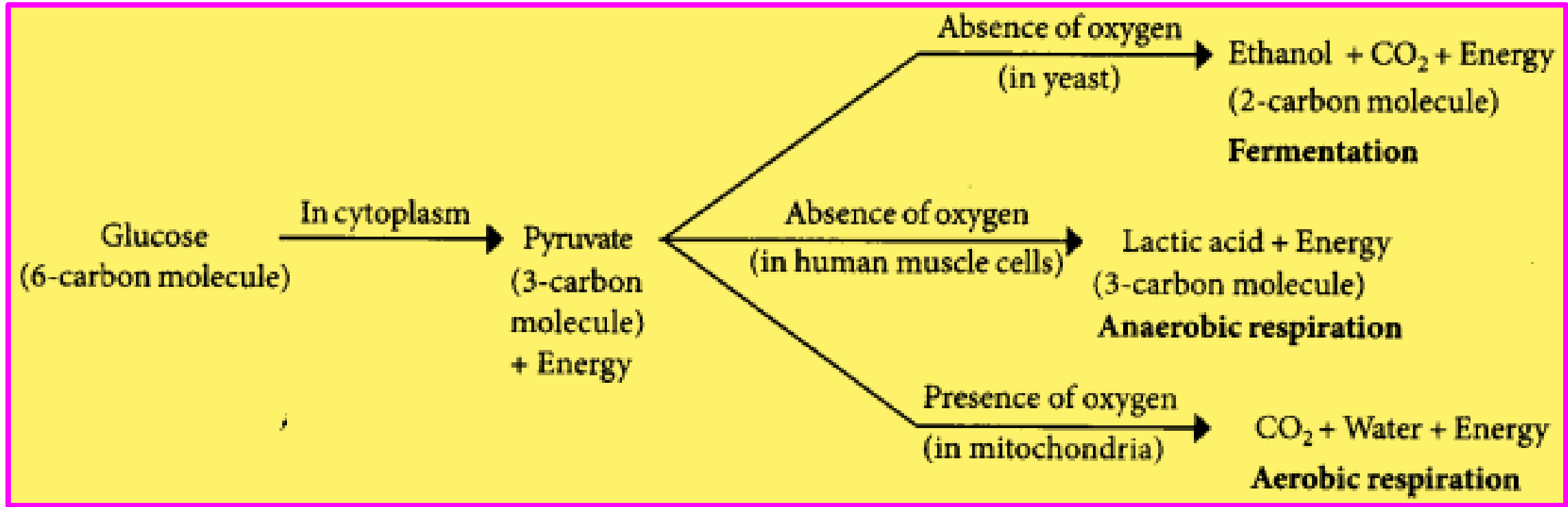
Answer: Differences between breathing and respiration are as follows:

Breathing	Respiration
(i) It is a physical process. It involves inhalation of fresh air and exhalation of foul air.	It is a biochemical process. It involves exchange of respiratory gases and also oxidation of food.
(ii) It is an extracellular process.	It is both an extracellular as well as intracellular process.
(iii) It does not involve enzyme action rather two types of muscles are involved in this process.	It involves a number of enzymes required for oxidation of food.

17. Draw a flow chart to show the breakdown of glucose by various pathways.

Answer:

Breakdown of glucose by various pathways:



18. Name the vein which brings blood to left atrium from lungs. (Board Term I, 2017)

Answer: Pulmonary vein carries oxygenated blood from lungs to left atrium of heart.

19. Define translocation in reference to plants. (Board Term I, 2016)

Answer: The transport of food prepared in the leaves, by the process of photosynthesis, to various parts (roots, stem, branches, etc.) of the plant is called translocation.

20. Write three types of blood vessels. Give one important feature of each. (Delhi 2019)

Answer:

The three types of blood vessels in human body are: (i) arteries, (ii) veins and (iii) capillaries.

(i) Arteries are the blood vessels which carry blood from heart to various parts of the body. The walls of arteries are thick, elastic and muscular that enables them to dilate but not rupture when the heart contracts and forces blood into them.

(ii) Veins are thin walled blood vessels which bring blood from the body back to the heart. They are larger and hold more blood than the arteries. The lumen of veins are provided with valves to prevent the backflow of blood.

(iii) Capillaries are thin walled and extremely narrow blood vessels which occur at the terminals of artery and vein. The wall of capillaries are permeable to water and dissolved substances so that the exchange of materials between the blood and body cells can take place.

21. (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. (AI 2019)

Answer:

a) Xylem tracheids and vessels are two water conducting tissues present in plants that help in rapid movement of water. In xylem tissue, vessels and tracheids of the roots, stems and leaves are interconnected to form a continuous system of water conducting channels reaching all parts of the plant.

Minerals and water needed by the plants are absorbed by root hairs from the soil by the process of osmosis and take in minerals by the process of diffusion. Thus, a difference in concentration of ions is created between the roots and the soil which enables the water to enter into roots to compensate the difference in concentration. The water, alongwith dissolved minerals from root hairs, passes into xylem vessels through cells of the cortex, endodermis and pericycle and then ascent of sap (i.e., upward movement of water and mineral salts from roots to the aerial parts of the plant against the gravitational force) takes place from xylem of the roots to the xylem of stem and leaves through vessels and tracheids. Evaporation of water molecules from the cells of leaves creates a suction pressure which pulls the water from xylem cells.

(b) Plants are autotrophic and do not have to move from one place to another in search of their food. Movements in a plant are usually at the cellular level and hence they required less amount of energy. Whereas animals are heterotrophic and locomote in search of food and other activities, hence require higher amount of energy than of plants.

22. Explain how the translocation of materials in phloem tissue in plants is achieved by utilising energy. (Board Term I, 2017)

Answer:

The phloem cells transport the soluble food materials to all parts of plant. The transport of food from leaves to different parts of plant is termed as translocation. Components of phloem are sieve tubes, companion cells, phloem parenchyma and phloem fibres. The food is manufactured in the mesophyll cells (or photosynthetic cells) of a leaf. The manufactured food enters into sieve tubes of the phloem and is transported as a dilute aqueous solution either in upward or downward direction. Food is transported to all non-green parts of the plant for their growth and metabolic activities. Besides food molecules, phloem also transports amino acids, hormones synthesised in the shoot tips and root tips and other metabolites.

In this process, glucose is transferred to phloem tissue using energy from ATP. This increases the osmotic pressure of the tissue causing the water to move into it (endosmosis). Soluble material is then transferred from phloem tissue to other tissues which have less pressure than in the phloem. Thus, according to plants requirement, the material is translocated from higher osmotic pressure areas to lower osmotic pressure areas.

23. What do the following transport?

- (i) Xylem (ii) Phloem (iii) Pulmonary vein (iv) Vena cava (v) Pulmonary artery (vi) Aorta (Board Term I, 2014)**

Answer: (i) Xylem is a specialised plant conducting tissue that transports water and minerals from roots to all aerial parts of plants which occurs against gravitational force with the help of ascent of sap.

(ii) Phloem transports food that is prepared in the leaves, through photosynthesis, to various parts of plant. This process is called translocation. Phloem also transports amino acids, hormones synthesised in the shoot tips and root tips and other metabolites.

(iii) Pulmonary vein present in human circulatory system brings oxygenated blood from lungs to the left atrium of heart.

(iv) Vena cava transport deoxygenated blood collected by all veins of body except pulmonary vein and pass it to the right atrium of heart.

(v) Pulmonary artery transports deoxygenated blood from right atrium of heart to lungs for oxygenation.

(vi) Aorta transports oxygenated blood from left atrium to systemic arteries which further take the blood to various body parts and organs

24. Explain giving any three reasons the significance of transpiration in plants.

Answer:

Significance of transpiration in plants:

- (i) The absorbed water is transported from roots to leaves through xylem vessels which is greatly influenced by transpiration pull.**
- (ii) The water stream moving upwards carries dissolved minerals with it. Transpiration also helps in distributing these minerals throughout the plant.**
- (iii) The evaporation of water during transpiration provide cooling effect to the leaves.**

25. List in tabular form three differences between arteries and veins.

Answer: Differences between arteries and veins are as follows:

Arteries	Veins
(i) Arteries are the blood vessels which carry blood away from the heart for distribution to the body.	Veins are blood vessels which bring blood from the body back to the heart.
(ii) Arteries walls are thick and valves are absent.	Their walls are thin and valves are present to prevent back flow of blood.
(iii) Blood passing through narrow lumen of arteries is mostly oxygenated and has a considerable pressure.	The blood passing through wide lumen of veins is deoxygenated (except in pulmonary veins) and has low pressure

26. Give reasons:

(a) Ventricles have thicker muscular walls than atria.

(b) Transport system in plants is slow.

(c) Circulation of blood in aquatic vertebrates differs from that in terrestrial vertebrates.

(d) During the daytime, water and minerals travel faster through xylem as compared to the night. (e) Veins have valves whereas arteries do not.

Answer: (a) Since ventricles have to pump blood into various organs with high pressure, they have thicker walls than atria.

(b) Transport system in plants is less elaborate than in animals, as plants are less active, so their cells do not need to be supplied with materials so quickly.

(c) The aquatic vertebrates like fish have gills to oxygenate blood. The flow of blood in a fish is single circulation because the blood passes through the heart only once in one complete cycle of body. The terrestrial vertebrates like birds and humans have double circulation as the blood travels heart twice in one complete cycle of blood and they have lungs for oxygenation of blood.

(d) It is because during daytime rate of transpiration is higher.

(e) The lumen of veins have valves, which allow the blood in them to flow in only one direction. Thus prevent back flow of blood.

27. (a) “Blood circulation in fishes is different from the blood circulation in human beings”. Justify the statement.

(b) Describe “blood circulation” in human beings.

Answer:

(a) Fishes have only two chambers in their heart, the blood is pumped to the gills to get oxygenated blood and from there it passes directly to rest of the body. Thus, the blood goes only once through the heart during one cycle of passage through the body. This type of circulation is termed as single circulation.

In human beings, during circulation blood travels twice through the heart in one complete cycle of the body and is called double circulation. The pathway of blood from the heart to the lungs and back to the heart is called pulmonary circulation and the pathway of blood from the heart to the rest of the body and back to heart is called systemic circulation.

(b) Deoxygenated blood from the body tissues is poured into right atrium. Contraction of heart forces it into right ventricle. From right ventricle, deoxygenated blood flows to the lungs through pulmonary artery. Oxygenated blood from lungs is returned into left atrium and then into left ventricle. The left ventricle forces the oxygenated blood to the whole body. Thus, for making one complete round or circulation circuit around all body parts, the blood passes through the heart twice. This is known as double circulation of blood.

28. (a) Mention any two components of blood.

(b) Trace the movement of oxygenated blood in the body.

(c) Write the function of valves present in between atria and ventricles.

(d) Write one structural difference between the composition of artery and veins. (2018)

Answer:

(a) Two components of blood are blood plasma and blood corpuscles.

(b) Deoxygenated blood gets oxygenated in the lungs, from there it moves to heart and pumped to different parts of the body. Its path can be traced out as

Lungs → Pulmonary veins → Left atrium of heart → Aorta → Arteries → Body parts

(c) When blood is pumped, valves prevent back flow of blood between ventricles and atria. They open and allow the right amount of blood to flow from one chamber to the other.

(d) Structural difference between veins and arteries is as follows:

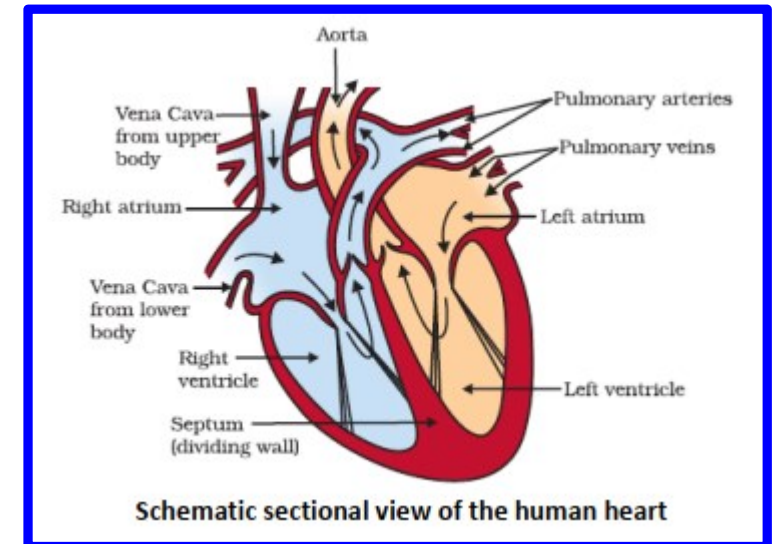
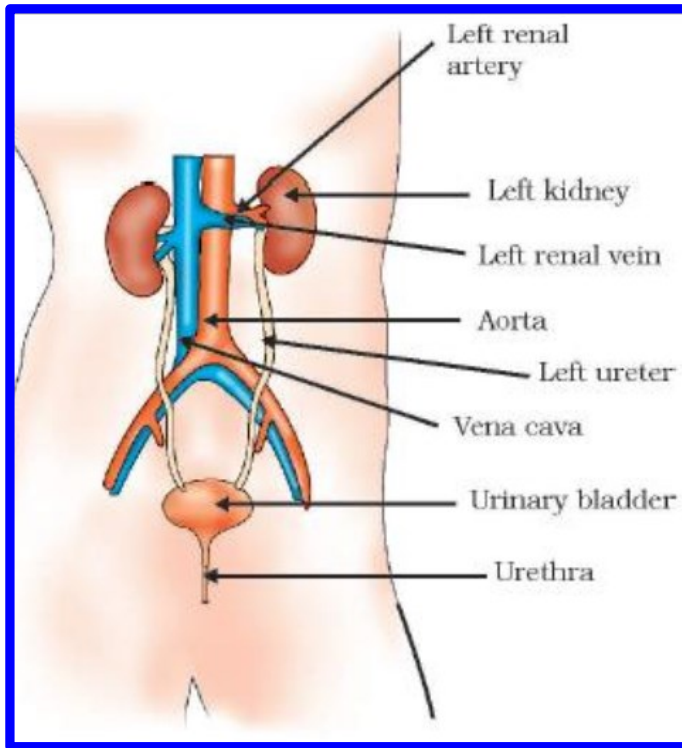
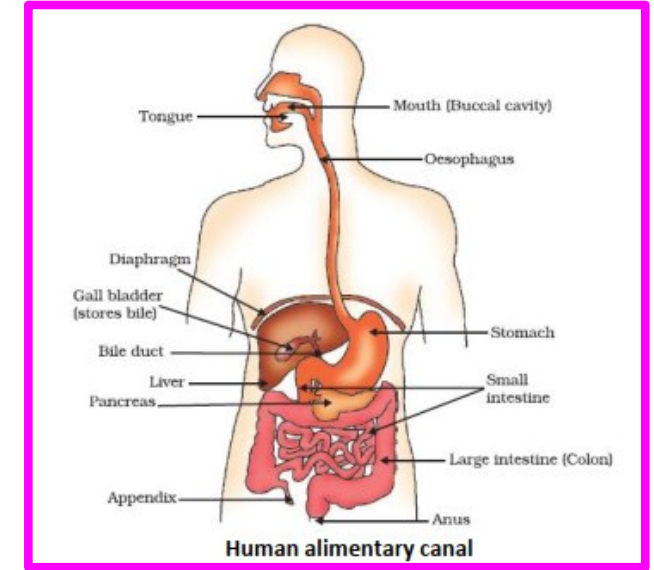
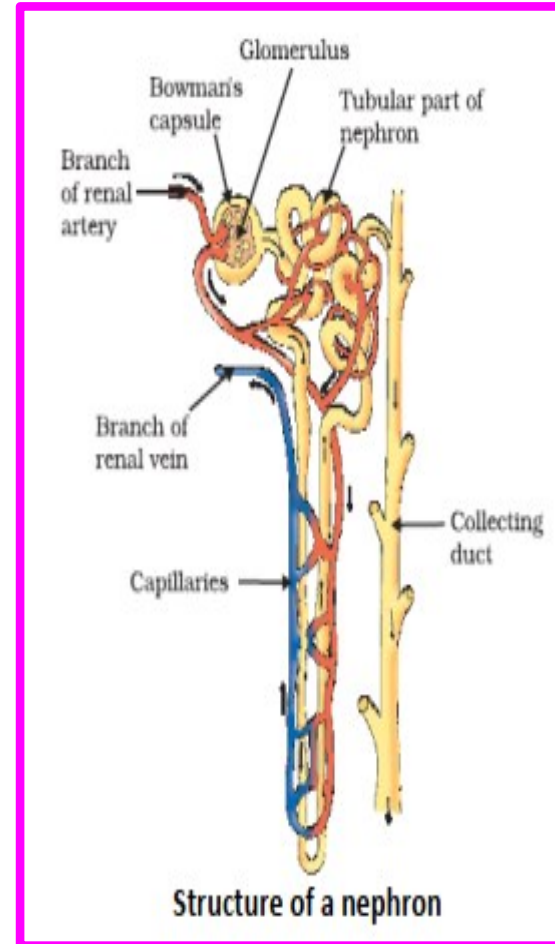
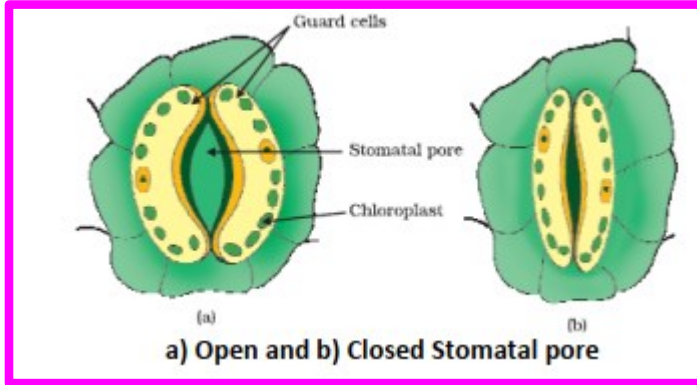
Veins:

Veins have thin, less elastic and less muscular walls. They have valves to prevent back flow of blood.

Arteries:

Arteries have thick, elastic and muscular walls with no valves.

29. Draw a neat diagram of [a] Human heart [b] Human alimentary canal [c] Structure of a nephron [d] Stomatal pore [e] Excretory system in human beings



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THANKS FOR WATCHING



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