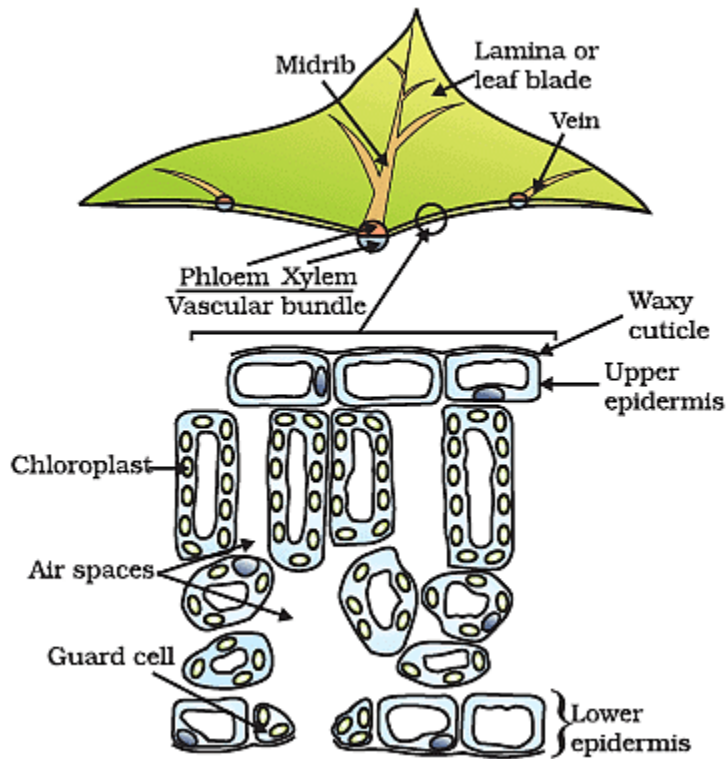


Life Processes

Q1: Answer the following questions based on the diagram given below:



Cross Section of a Leaf

(i) What are the green dots observed in the cells of a leaf under the microscope?

Ans: The green dots observed in the cells of a leaf under the microscope are cell organelles called chloroplasts.

(ii) What is the function of chloroplasts in plant cells?

Ans: Chloroplasts are responsible for photosynthesis, the process by which plants make their own food using sunlight, carbon dioxide, and water.

(iii) How can you demonstrate that chlorophyll is essential for photosynthesis using this experiment?

Ans: By comparing a leaf section with chlorophyll (green) to a leaf section without chlorophyll (non-green), you can show that only the green section can carry out photosynthesis, producing starch when exposed to light.

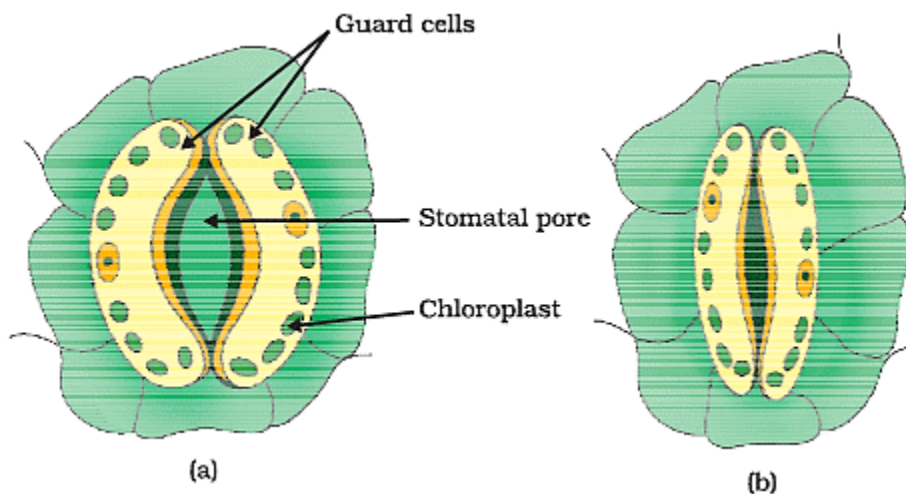
(iv) What substance should you use to test for the presence of starch in the leaf sections?

Ans: You should use iodine solution to test for the presence of starch in the leaf sections. Iodine turns blue-black in the presence of starch.

(v) Explain the role of chlorophyll in photosynthesis.

Ans: Chlorophyll absorbs sunlight and uses this energy to convert carbon dioxide and water into glucose (a sugar) and oxygen during photosynthesis. This process is essential for a plant's survival as it provides energy and food for the plant and releases oxygen into the atmosphere.

Q2: Answer the following questions based on the diagram given below:



of Stomata

(i) What is the function of stomatal pores in plants?

Ans: Stomatal pores in plants are tiny openings on the surface of leaves and stems that allow for the exchange of gases, primarily carbon dioxide and oxygen. They play a crucial role in photosynthesis and respiration.

(ii) Describe the image you see that shows open stomatal pores.

Ans: In the image, you would observe that the stomatal pores are open. This means that the guard cells surrounding the pores have swollen and created an opening. This allows for the entry of carbon dioxide (CO_2) for photosynthesis and the exit of oxygen (O_2) and water vapor (H_2O) through transpiration.

(iii) What causes stomatal pores to open and close?

Ans: Stomatal pores open and close due to changes in pressure in the guard cells. When

the guard cells take up water and become turgid, they swell and cause the stomatal pore to open. Conversely, when the guard cells lose water and become flaccid, the pore closes.

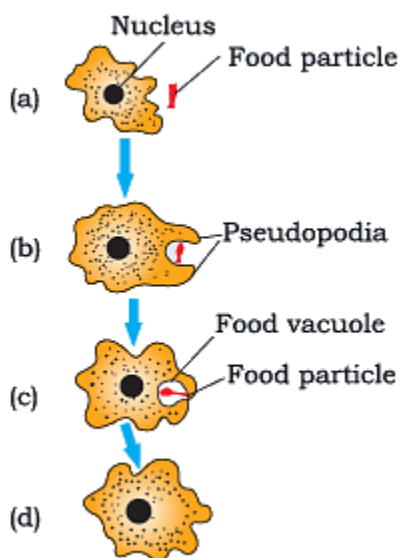
(iv) Explain the importance of stomatal regulation for a plant.

Ans: Stomatal regulation is vital for plants because it allows them to control the exchange of gases and the loss of water vapor. By opening and closing stomatal pores, plants can balance the need for carbon dioxide for photosynthesis with the need to minimize water loss through transpiration. This helps them survive in varying environmental conditions.

(v) What happens to stomatal pores during hot and dry conditions, and why?

Ans: During hot and dry conditions, stomatal pores tend to close. This is an adaptive response by the plant to reduce water loss through transpiration. Closing the stomata helps conserve water, but it can also limit the entry of carbon dioxide for photosynthesis. In such conditions, plants must strike a balance between conserving water and meeting their energy needs.

Q3: Answer the following questions based on the diagram given below:



Nutrition in Amoeba

(i) Describe the process shown in the diagram related to nutrition in Amoeba.

Ans: The diagram likely represents phagocytosis, where Amoeba engulfs food particles by extending its pseudopodia.

(ii) What is the primary food source for Amoeba, as indicated in the diagram?

Ans: Amoeba primarily feeds on small microorganisms or particles, such as bacteria or algae, as depicted in the diagram.

(iii) Explain the role of the contractile vacuole in the nutrition process of Amoeba.

Ans: The contractile vacuole helps regulate the water content in Amoeba by expelling excess water, maintaining osmotic balance during digestion.

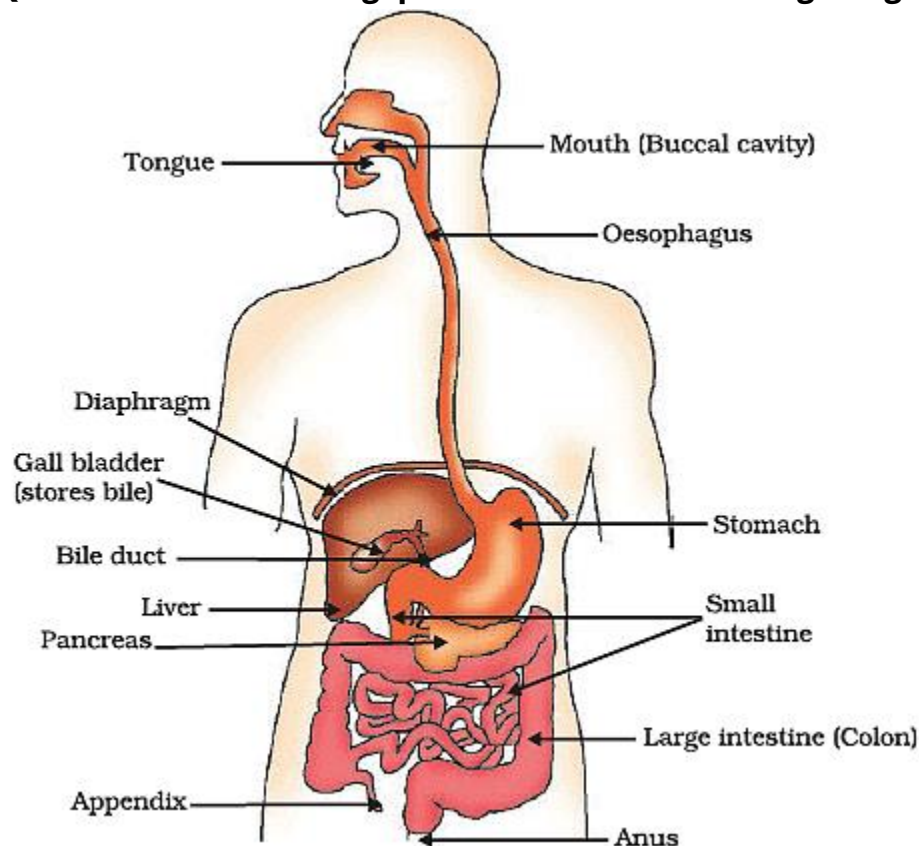
(iv) What term is used to describe the process of engulfing food particles in Amoeba?

Ans: The process is called "phagocytosis," where Amoeba surrounds and engulfs food particles using pseudopodia.

(v) How does the diagram illustrate the formation of food vacuoles in Amoeba?

Ans: The diagram likely shows food vacuoles forming as a result of phagocytosis, where the engulfed food particles are enclosed in a membrane to create a food vacuole for digestion.

Q4: Answer the following questions based on the diagram given below:



Human Digestive

System

(i) What is the function of the mouth in the human alimentary canal?

Ans: The mouth is the beginning of the human alimentary canal and plays a crucial role in the digestion process. Its primary functions are:

- Ingestion: It is where food enters the body.
- Mechanical Digestion: Chewing breaks down food into smaller pieces, increasing its surface area for enzymes to act upon.
- Chemical Digestion: Saliva contains enzymes (amylase) that begin the digestion of carbohydrates.

(ii) Name the three major parts of the small intestine and explain their functions.

Ans: The small intestine consists of three major parts: the duodenum, jejunum, and ileum.

- Duodenum: It receives partially digested food from the stomach and continues digestion. Bile from the liver and pancreatic juice from the pancreas enter here to aid in digestion.
- Jejunum: It is the middle part and is responsible for the absorption of nutrients, such as carbohydrates, proteins, and fats.
- Ileum: This is the final part of the small intestine where further nutrient absorption takes place, especially of vitamins and minerals.

(iii) What is the role of the stomach in the human digestive system?

Ans: The stomach has several important functions in the digestive system:

- Mixing: It mixes food with gastric juices, creating a semi-liquid substance called chyme.
- Digestion: Gastric juice contains enzymes (pepsin) that break down proteins into smaller peptides.
- Storage: The stomach temporarily stores food and regulates its release into the small intestine.

(iv) Explain the function of the pancreas in the digestive system.

Ans: The pancreas is a vital organ in digestion. Its functions include:

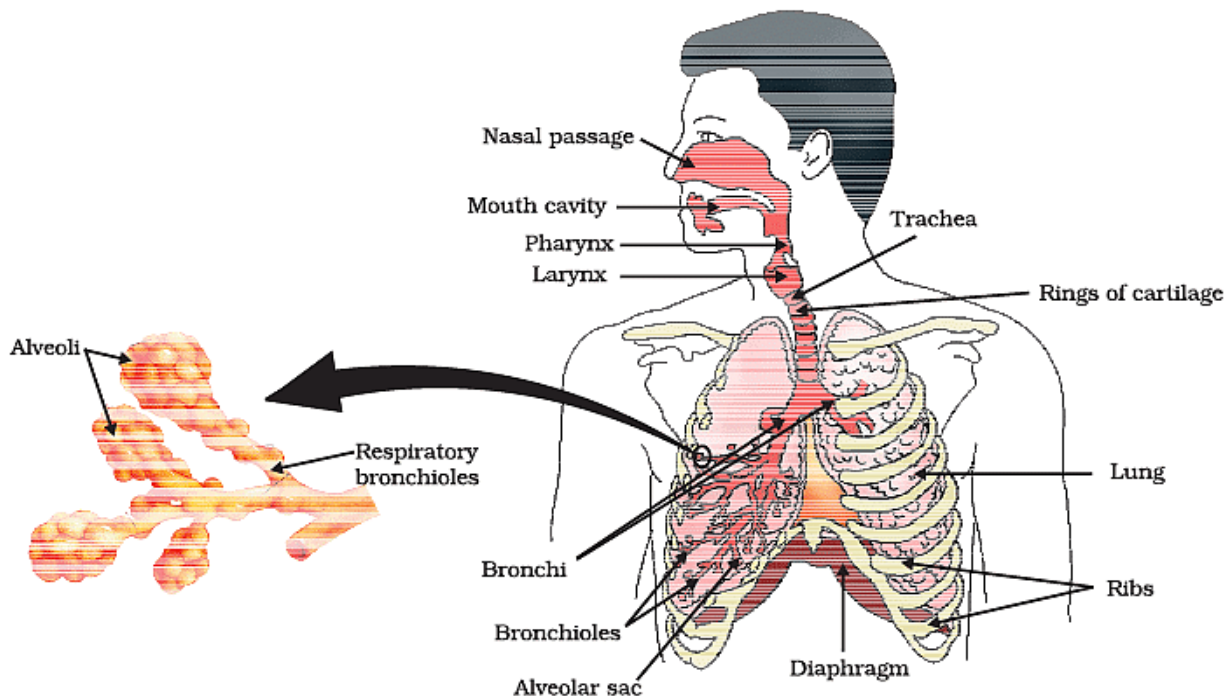
- Producing digestive enzymes: It releases pancreatic juice into the duodenum, which contains enzymes like amylase (for carbohydrates), lipase (for fats), and trypsin (for proteins).
- Regulating blood sugar: The pancreas also secretes insulin and glucagon, hormones that control blood sugar levels.

(v) What happens in the large intestine, and what is its role in digestion?

Ans: The large intestine, also known as the colon, performs the following functions:

- Absorption of water and electrolytes: It reabsorbs water and salts from undigested food, forming solid feces.
- Fermentation: Beneficial bacteria in the large intestine help ferment some remaining carbohydrates and produce certain vitamins.
- Storage and elimination: It stores feces until they are ready to be eliminated from the body through the rectum and anus.

Q5: Answer the following questions based on the diagram given below:



Human Respiratory System

(i) Name the primary organs involved in the human respiratory system.

Ans: The primary organs involved in the human respiratory system are the lungs.

(ii) What is the main function of the respiratory system?

Ans: The main function of the respiratory system is to facilitate the exchange of oxygen (O_2) from the air with carbon dioxide (CO_2) from the body's cells.

(iii) How does the diaphragm help in the process of breathing?

Ans: The diaphragm is a muscle that contracts and flattens when you inhale, increasing the volume of the chest cavity. This action creates a vacuum, drawing air into the lungs. When it relaxes during exhalation, it pushes air out of the lungs.

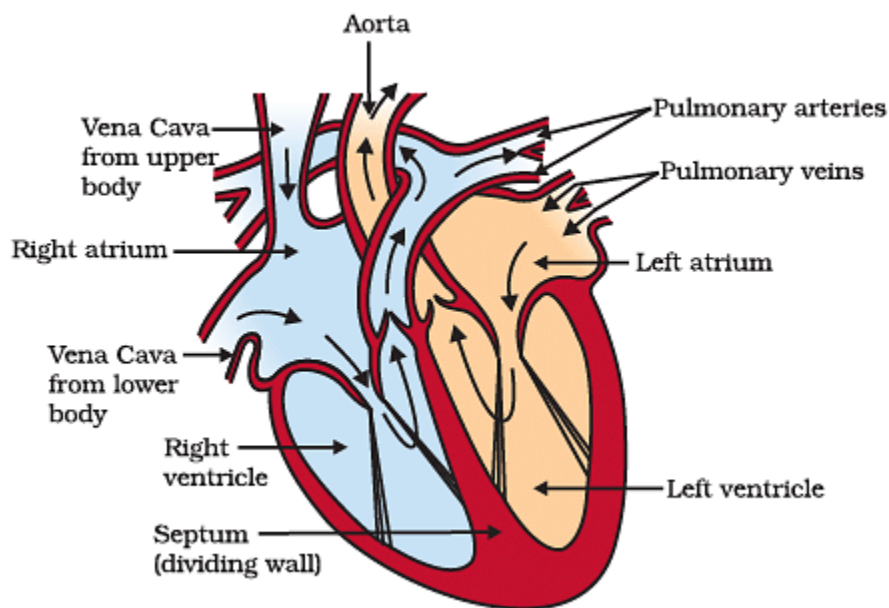
(iv) What are alveoli, and why are they important in the respiratory system?

Ans: Alveoli are tiny air sacs in the lungs where the actual exchange of gases (oxygen and carbon dioxide) takes place. They have thin walls and a large surface area, which allows for efficient gas exchange between the lungs and the bloodstream.

(v) Explain the role of cilia and mucus in the respiratory system.

Ans: Cilia are tiny hair-like structures lining the respiratory tract. They move in coordinated waves to push mucus and trapped particles up and out of the respiratory system. Mucus is a sticky substance that traps dust, bacteria, and other foreign particles, preventing them from entering the lungs and causing infection.

Q6: Answer the following questions based on the diagram given below:



Human Heart

(i) Label the four chambers of the heart in the diagram.

Ans: The four chambers of the heart are labeled as follows:

1. Right Atrium
2. Right Ventricle
3. Left Atrium
4. Left Ventricle

(ii) What is the function of the valves shown in the heart diagram?

Ans: The valves in the heart, such as the tricuspid and bicuspid (mitral) valves, ensure that blood flows in one direction, preventing backward flow. They help maintain the unidirectional flow of blood through the heart.

(iii) Which side of the heart pumps oxygenated blood to the body, and which side pumps deoxygenated blood to the lungs?

Ans: The left side of the heart pumps oxygenated blood to the body, while the right side pumps deoxygenated blood to the lungs for oxygenation.

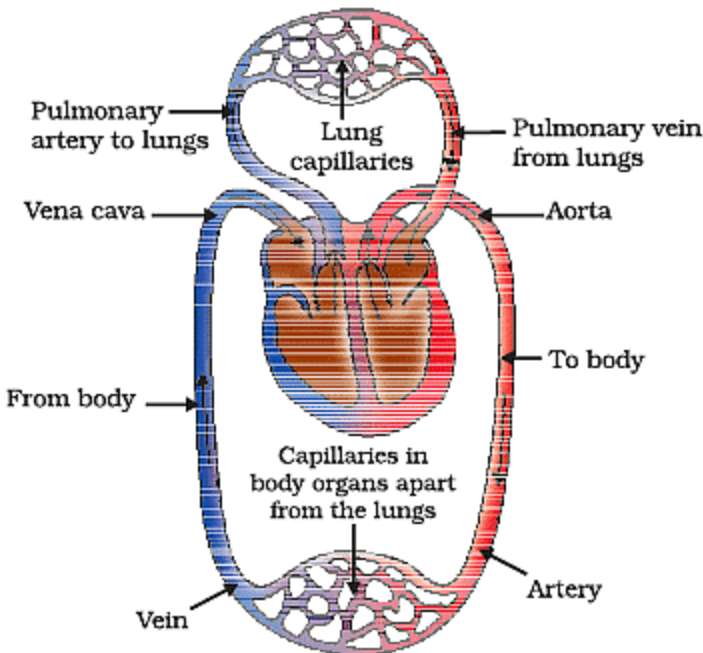
(iv) Describe the pathway of blood through the heart starting from the right atrium.

Ans: Blood flows into the right atrium from the body through the superior and inferior vena cava. From the right atrium, it passes through the tricuspid valve into the right ventricle. When the right ventricle contracts, it pumps blood into the pulmonary artery, which carries it to the lungs for oxygenation.

(v) Why does the left ventricle have a thicker muscular wall compared to the right ventricle?

Ans: The left ventricle has a thicker muscular wall because it needs to pump oxygenated blood to the entire body, which requires more force. In contrast, the right ventricle only pumps blood to the nearby lungs, so it has a thinner muscular wall as it doesn't require as much force to do so.

Q7: Answer the following questions based on the diagram given below:



Exchange of Gases

(i) What are the main organs involved in the exchange of oxygen and carbon dioxide as shown in the diagram?

Ans: The main organs involved are the lungs, where the exchange takes place between air and blood, and body tissues where oxygen is used and carbon dioxide is produced.

(ii) In the diagram, what represents the red blood cells? What is their role in this process?

Ans: Red blood cells are represented by the red circles in the diagram. Their role is to transport oxygen from the lungs to body tissues and carry carbon dioxide from body tissues back to the lungs for removal.

(iii) What does the blue arrow in the diagram indicate?

Ans: The blue arrow represents the flow of oxygen-rich blood from the lungs to the body tissues, delivering oxygen for cellular respiration.

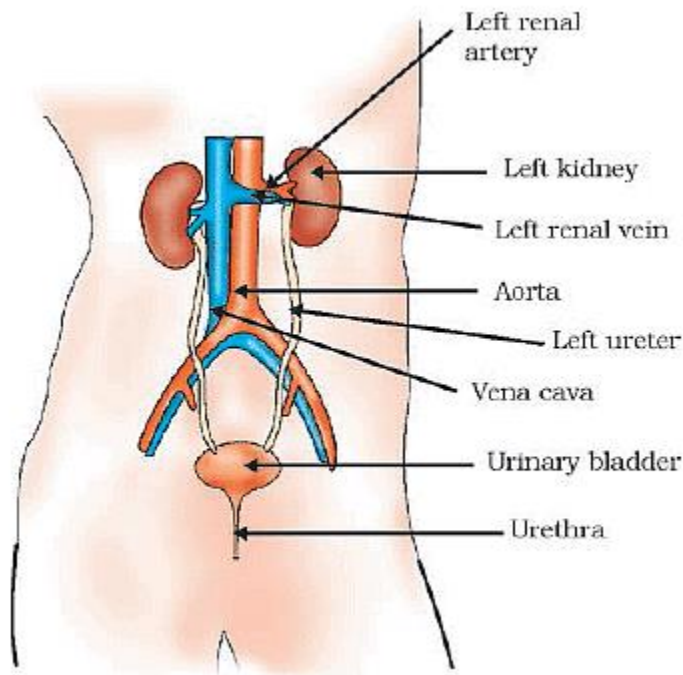
(iv) Explain the role of the small blood vessels (capillaries) in the exchange of gases shown in the diagram.

Ans: Capillaries are where the actual exchange of gases occurs. They are the thin-walled blood vessels that allow oxygen to diffuse into body tissues from the bloodstream and enable carbon dioxide to diffuse out of the tissues into the bloodstream.

(v) What is the significance of the arrows going in opposite directions between the lungs and body tissues in the diagram?

Ans: The arrows going in opposite directions represent the bidirectional flow of oxygen and carbon dioxide. Oxygen is taken from the lungs to the tissues, while carbon dioxide is transported from the tissues back to the lungs for elimination. This illustrates the continuous exchange required for respiration.

Q8: Answer the following questions based on the diagram given below:



Human Excretory System

(i) What are the main organs of the human excretory system, and what are their functions?

Ans: The main organs of the human excretory system are the kidneys, ureters, urinary bladder, and urethra. The kidneys filter waste and excess substances from the blood to form urine, which is then transported by the ureters to the urinary bladder. The urinary bladder stores urine until it is eliminated from the body through the urethra.

(ii) What is the role of the nephrons in the kidneys?

Ans: Nephrons are the functional units of the kidneys. They filter blood to remove waste products, excess ions, and water, which then combine to form urine. Nephrons also help in maintaining the body's water and electrolyte balance.

(iii) How does the excretory system help in maintaining the body's internal environment?

Ans: The excretory system helps maintain the body's internal environment by regulating

the balance of water and electrolytes (like sodium and potassium) in the blood. It removes waste products like urea and excess substances to keep the body's internal conditions stable.

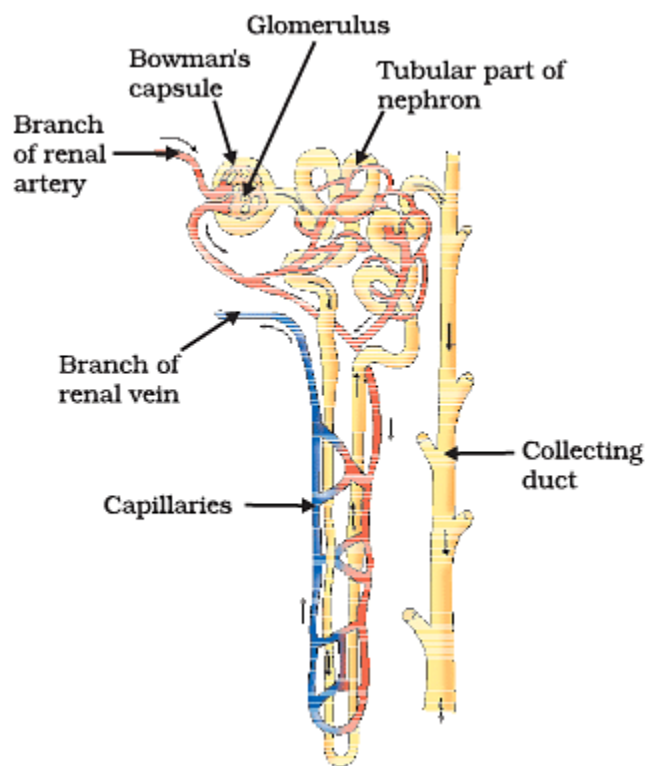
(iv) What is the importance of the urethra in the excretory system?

Ans: The urethra is a tube that carries urine from the urinary bladder to the outside of the body. It plays a crucial role in the excretory system by allowing the elimination of urine, which contains waste products. In males, the urethra also serves as a passageway for semen during reproduction.

(v) How can we keep our excretory system healthy?

Ans: To keep the excretory system healthy, it's essential to drink plenty of water to help flush out waste products. A balanced diet with limited salt and sugar intake is also important. Regular exercise and avoiding tobacco and excessive alcohol can contribute to a healthy excretory system. Additionally, maintaining good hygiene and timely urination can prevent urinary tract infections.

Q9: Answer the following questions based on the diagram given below:



Nephron

(i) What is the main function of a nephron in the human body?

Ans: The main function of a nephron is to filter blood and remove waste products and excess substances to form urine.

(ii) Name the two main parts of a nephron and briefly describe their functions.

Ans: A nephron consists of two main parts: the renal corpuscle and the renal tubule. The renal corpuscle filters blood, while the renal tubule reabsorbs useful substances and secretes waste products.

(iii) Which specific structure in the nephron is responsible for the initial filtration of blood?

Ans: The structure responsible for the initial filtration of blood in the nephron is the glomerulus, which is part of the renal corpuscle.

(iv) What is the role of the loop of Henle in the nephron?

Ans: The loop of Henle is responsible for reabsorbing water and certain salts (sodium and chloride) from the filtrate, helping to concentrate urine and regulate the body's water balance.

(v) How does the nephron help in maintaining the body's pH balance?

Ans: The nephron helps maintain the body's pH balance by selectively reabsorbing or secreting hydrogen ions and bicarbonate ions in response to changes in blood pH, helping to regulate the body's acid-base balance.