

Chapter 7 Transportation in Animals and Plants - Textbook Exercise -(Solved)

Match structures given in Column I with functions given in Column II.

Column I	Column II
(i) Stomata	(a) Absorption of water
(ii) Xylem	(b) Transpiration
(iii) Root hairs	(c) Transport of food
(iv) Phloem	(d) Transport of water
	(e) Synthesis of carbohydrates

Answers-

(i) Stomata- Match- (b) Transpiration

Explanation- Stomata are tiny openings predominantly found on the surface of leaves. They play an instrumental role in the process of transpiration, allowing the plant to lose water in the form of water vapour to the atmosphere.

(ii) Xylem-Match- (d) Transport of water

Explanation- Xylem is a specialised tissue in plants, primarily responsible for the transport of water and dissolved nutrients from the roots to various parts of the plant. It acts like a continuous network throughout the plant, ensuring efficient water and nutrient transport.

(iii) Root hairs- Match- (a) Absorption of water

Explanation- Root hairs are specialised structures found in the roots of plants. They increase the surface area of roots, enabling efficient absorption of water and mineral nutrients from the soil.

(iv) Phloem- Match- (c) Transport of food

Explanation- Phloem is another specialised tissue in plants, but its primary function is to transport synthesised food (like glucose) from the leaves to various parts of the plant. This

ensures that all parts of the plant receive the necessary nutrients, regardless of whether they are involved in the food synthesis process or not.

Also Check [-NCERT Exemplar Solutions- Class 7 Science Chapter – 11-Transportation in Animals and Plants](#)

Fill in the blanks.

(i) The blood from the heart is transported to all parts of the body by the _____.

Answer- arteries

Explanation- The arteries are responsible for carrying oxygen-rich blood from the heart to various parts of the body. This oxygenated blood is then utilised by the body's cells for various functions.

(ii) Haemoglobin is present in _____ cells.

Answer- red blood

Explanation- Haemoglobin is a protein present in red blood cells. It binds to oxygen and helps in transporting it from the lungs to different parts of the body, and it also helps in carrying carbon dioxide from the body's cells back to the lungs.

(iii) Arteries and veins are joined by a network of _____.

Answer- capillaries

Explanation- Capillaries act as a bridge between arteries and veins. They facilitate the exchange of oxygen, nutrients, and waste materials between the blood and the body's cells due to their thin walls.

(iv) The rhythmic expansion and contraction of the heart is called _____.

Answer- heartbeat

Explanation- A heartbeat includes the rhythmic contraction (systole) and relaxation (diastole) of the heart muscles, pumping blood throughout the body.

(v) The main excretory product in human beings is _____.

Answer- urea

Explanation- Urea is the primary waste product excreted by the kidneys. It is produced from the breakdown of proteins and is removed from the body in urine.

(vi) Sweat contains water and _____.

Answer- salts

Explanation- Sweating helps in regulating body temperature, and sweat primarily consists of water and salts, and it also contains small amounts of waste products.

(vii) Kidneys eliminate the waste materials in the liquid form called _____.

Answer- urine

Explanation- The kidneys filter the blood to remove waste products and excess substances, which are then excreted as urine.

(viii) Water reaches great heights in the trees because of suction pull caused by _____.

Answer- transpiration

Explanation- Transpiration causes a negative pressure or suction in the xylem vessels,

helping in the upward movement of water and nutrients from the roots to the various parts of the plant.

Also Check - [Rapid Revision – Class 7 Science- Chapter 11- Transportation in Animals and Plants](#)

Question 3a- In plants, water is transported through

- (i) xylem
- (ii) phloem
- (iii) stomata
- (iv) root hair

Answer- (i) xylem

Explanation- The xylem is a type of vascular tissue in plants that is responsible for transporting water and dissolved minerals absorbed from the roots to the rest of the plant. This specialised tissue is crucial for supporting the plant's hydration needs and overall nutrient transport.

Question 3b- Water absorption through roots can be increased by keeping the plants

- (i) in the shade
- (ii) in dim light
- (iii) under the fan
- (iv) covered with a polythene bag

Answer- (iii) under the fan

Explanation- Placing plants under a fan increases the rate of transpiration because the fan circulates the air and removes the moisture present on the leaf surface. This results in water being pulled up more rapidly through the roots to replace the lost moisture, thus increasing the overall absorption of water through the roots.

Question- Why is transport of materials necessary in a plant or in an animal? Explain.

Answer- Transport of materials is crucial in both plants and animals as it facilitates the distribution of nutrients, oxygen, and other essential substances, as well as the removal of waste products.

Explanation-

In Plants-

- **Distribution of Water and Nutrients-** Plants absorb water and essential minerals from the soil through their roots. The absorbed materials are transported upwards to various parts of the plants, including stems and leaves, through specialised vessels.

- Transport of Food- Plants prepare their food through the process of photosynthesis, which occurs mainly in the leaves. The synthesised food, in the form of glucose, is transported to different parts of the plant for growth, energy, and storage.
- Elimination of Waste- Plants also need a system to remove the waste products formed during various metabolic activities. Transport systems in plants assist in moving these waste products to parts where they can be stored or released.

In Animals-

- Circulation of Oxygen and Nutrients- Animals require a constant supply of oxygen and nutrients to their body cells for various metabolic activities. The circulatory system ensures that these essential substances are transported to each cell of the body.
- Removal of Waste- Metabolic activities in animals' body cells produce waste products that need to be eliminated. The transport system carries these waste products to specific organs like kidneys, where they are removed from the body.
- Hormonal Distribution- The transport system also plays a vital role in the distribution of hormones, which are chemical messengers necessary for communication between various parts of the body and maintaining homeostasis.

5. What will happen if there are no platelets in the blood?

Answer- If there are no platelets in the blood, the body would be unable to form blood clots. This would lead to excessive bleeding, even from minor wounds, and an inability to heal wounds efficiently. Platelets, also known as thrombocytes, play a vital role in the coagulation process. They aggregate at the site of injury, releasing various substances that initiate the clotting mechanism and stop bleeding.

Question 6- What are stomata? Give two functions of stomata.

Answer- Stomata are tiny openings or pores found primarily on the undersurface of plant leaves. Two primary functions of stomata are-

- **Transpiration-** Stomata allow for the loss of water vapour from the plant to the atmosphere, which aids in cooling the plant and pulling water and nutrients from the roots to the rest of the plant.
- **Gas Exchange-** Stomata facilitate the exchange of gases, primarily oxygen and carbon dioxide, between the plant's internal tissues and the external environment. This is crucial for the process of photosynthesis, where plants take in carbon dioxide and release oxygen.

Question 7- Does transpiration serve any useful function in the plants? Explain.

Answer- Yes, transpiration serves several useful functions in plants. Transpiration is the process where plants lose water in the form of water vapour from the surface of the leaves. This process is essential because-

- **Cooling Effect-** As water evaporates from the leaves' surface, it cools the plant down, preventing overheating, especially in a hot environment.
- **Nutrient Transportation-** Transpiration helps in the upward movement of water and minerals from the roots to various parts of the plants. The loss of water from the leaves creates a suction that pulls water and dissolved nutrients upwards.
- **Maintaining Cell Turgidity-** Transpiration helps maintain the turgidity of cells, aiding in the structural integrity of the plant.

Question 8- What are the components of blood?

Answer- Blood is composed of several components, each serving a unique function. The primary components include-

- **Red Blood Cells (RBCs)-** RBCs or erythrocytes are involved in the transport of oxygen from the lungs to the body's cells and tissues. They also carry carbon dioxide, a waste product, away from the cells and back to the lungs for exhalation.
- **White Blood Cells (WBCs)-** WBCs or leukocytes play a crucial role in the immune system. They help fight infections by attacking bacteria, viruses, and other pathogens.
- **Platelets-** Platelets or thrombocytes are involved in the clotting mechanism of the blood. They help prevent excessive bleeding when we get injured.
- **Plasma-** Plasma is the liquid part of the blood in which cells and other blood components are suspended. It carries nutrients, hormones, and waste products between body tissues and the organs that process these substances.

Question 9- Why is blood needed by all the parts of a body?

Answer- Blood is essential for all parts of the body because it performs various crucial functions necessary for the survival and well-being of the organism-

- **Nutrient Transportation-** Blood transports essential nutrients such as glucose, vitamins, and minerals to various cells and tissues throughout the body. These nutrients are vital for the energy, growth, and repair of cells.
- **Oxygen Transportation-** Haemoglobin present in the red blood cells carries oxygen from the lungs to all the body parts. Cells utilise this oxygen for producing energy essential for their functions.
- **Waste Removal-** Blood carries waste products such as carbon dioxide and urea away from the cells. These waste products are then excreted from the body through the lungs and kidneys, keeping the body clean and preventing toxin accumulation.
- **Immune Defence-** Blood contains white blood cells that defend the body against infections and foreign invaders. These cells identify, attack, and eliminate pathogens, keeping the body healthy.

Question 10- What makes the blood look red?

Answer- The red colour of the blood is due to a protein called haemoglobin present in the red blood cells. Haemoglobin binds to oxygen molecules, resulting in the formation of oxyhemoglobin, which has a bright red colour. Even when oxygen is not bound to it,

haemoglobin still gives blood a red colour, but it appears darker. The presence of a high number of red blood cells, each containing haemoglobin, in the blood contributes to its overall red appearance. This characteristic red colour helps in the identification of oxygen-rich and oxygen-poor blood in the circulatory system.

Question 11- Describe the function of the heart.

Answer- The heart is a vital organ in the body that serves as a pump for the circulation of blood. Its main functions include-

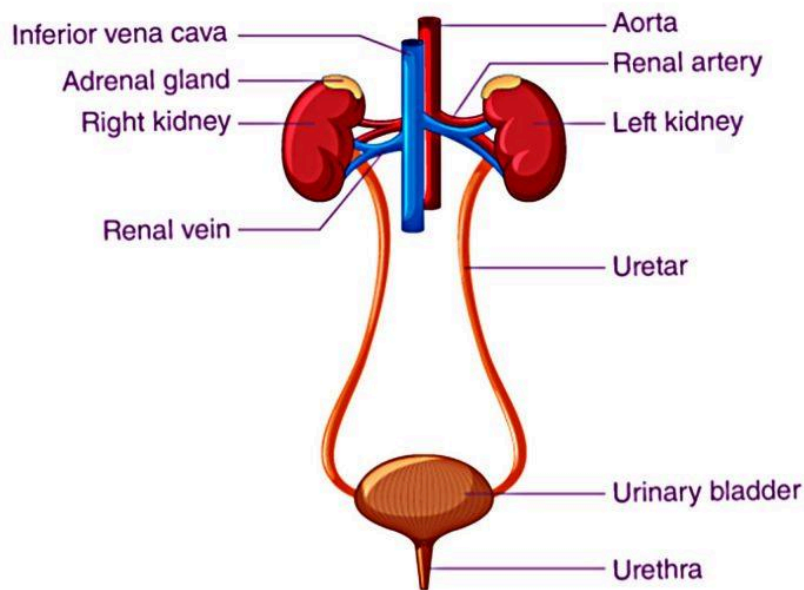
- **Pumping Oxygenated Blood-** The left side of the heart receives oxygen-rich blood from the lungs and pumps it into the body through arteries. This oxygenated blood is essential for the cells and organs to perform their functions effectively.
- **Pumping Deoxygenated Blood-** The right side of the heart receives oxygen-poor, carbon dioxide-rich blood from the body and pumps it to the lungs through the pulmonary artery. In the lungs, carbon dioxide is removed from the blood, and it gets oxygenated.
- **Maintaining Blood Pressure-** By continuously pumping blood, the heart helps in maintaining the pressure necessary to allow blood to reach every part of the body efficiently.
- **Supporting Metabolic Processes-** By ensuring the supply of oxygen and nutrients to various tissues and organs, the heart supports the metabolic processes necessary for energy production and other cellular activities.

Question 12- Why is it necessary to excrete waste products?

Answer- Excretion of waste products is essential for various reasons such as-

- **Maintaining Homeostasis-** Excretion helps in maintaining the internal balance of the body by removing excess substances and waste products produced during metabolic processes.
- **Preventing Toxic Accumulation-** Waste products like urea, ammonia, and other metabolic wastes can be toxic if allowed to accumulate in the body. Excretion ensures that these harmful substances are removed, preventing possible damage to organs and tissues.
- **Regulating Body Fluids-** Excretion helps regulate the volume and composition of body fluids, contributing to the overall balance and functionality of physiological processes.

Question 13- Draw a diagram of the human excretory system and label the various parts.



Human excretory system Diagram

Explanation Of human excretory system Diagram Labels

- **Kidneys-**
 - **Explanation-** The kidneys are bean-shaped organs that act as the body's natural filter. They remove waste products and excess substances from the blood, forming urine. The kidneys also play a role in regulating blood pressure, electrolyte balance, and red blood cell production.
- **Ureters-**
 - **Explanation-** Ureters are muscular tubes that transport urine from the kidneys to the urinary bladder. They use coordinated muscle contractions (peristalsis) to move urine down away from the kidneys.
- **Urinary Bladder-**
 - **Explanation-** The urinary bladder is a muscular sac that stores urine temporarily. It holds the urine until it is eliminated from the body through the process of urination. The bladder's muscular wall contracts during urination to expel urine.
- **Urethra-**
 - **Explanation-** The urethra is a tube that connects the urinary bladder to the exterior of the body. It serves as the exit pathway for urine. In males, the urethra also serves as a passage for semen during ejaculation.

Extended Learning - Activities and Projects

Question- Find out about blood groups and their importance.

Answer- Blood groups, also known as blood types, are classifications of blood based on the presence or absence of specific antigens on the surface of red blood cells. There are four main blood groups- A, B, AB, and O, each of which can be either Rh positive (+) or Rh

negative (-), resulting in a total of eight possible blood types (e.g., A+, A-, B+, B-, AB+, AB-, O+, O-).

Importance of Blood Groups-

- **Transfusion-** Knowing the blood group is crucial for blood transfusions. It ensures that the donor's blood is compatible with the recipient's, preventing adverse reactions.
- **Pregnancy-** In pregnancy, the blood group and Rh factor of both the mother and the foetus are essential to prevent Rh incompatibility, which can lead to complications such as hemolytic disease of the newborn (HDN).
- **Organ Transplant-** Blood group matching is also necessary for organ transplants to minimise the risk of organ rejection.

Question- When a person suffers from chest pain, the doctor immediately takes an ECG. Visit a doctor and get information about ECG.

Answer- An ECG, or electrocardiogram, is a diagnostic tool used to assess the electrical activity of the heart. It is a non-invasive procedure where electrodes are placed on the skin, and electrical impulses generated by the heart are recorded and displayed as waveforms.

Information about ECG-

- **Purpose-** ECG is primarily used to diagnose and assess various heart conditions such as arrhythmias, heart attacks, and other structural heart conditions.
- **Procedure-** Electrodes are attached to the patient's chest, arms, and legs, which are connected to the ECG machine. The machine then records the heart's electrical activity for a certain period.
- **Interpretation-** A doctor, usually a cardiologist, interprets the ECG. The different waves and intervals on the ECG tracing represent various phases of the cardiac cycle, and deviations from the normal pattern indicate potential heart issues.