

NCERT QUESTIONS WITH SOLUTIONS

1. What are the components of the transport system in human beings? What are the functions of these components?

Ans. Human transport system has two components, blood vascular system and lymphatic system.

Blood Vascular System- It consists of blood, blood vessels and heart.

1. Heart- It is pumping organ of blood vascular system.

2. Blood is made up of plasma and three types of cells – red blood corpuscles, white blood corpuscles and blood platelets.

(a) Blood Plasma-

(i) Helps in transport of nutrients, excretory materials, hormones etc.

(ii) Have antibodies in the form of immunoglobins.

(iii) Prothrombin and fibrinogen proteins required for blood clotting are present in plasma.

(b) Red Blood Corpuscles-Transport of oxygen as oxyhaemoglobin. Also transports some amount of CO₂.

(c) White Blood Corpuscles-Phagocytosis of germ cells, production of antibodies and histamine.

(d) Blood Platelets-Formation of thromboplastin for blood clotting.

3. Blood Vessels-

(a) Arteries- Transports blood from heart to different body parts.

(b) Veins- Transports blood towards heart from various body parts.

(c) Capillaries- Exchange of materials between blood and living cells through tissue fluid.

Lymphatic System- It consists –

1. Lymph
2. Lymph Vessels
3. Lymph Nodes

2. Why it is necessary to separate oxygenated and deoxygenated blood in mammals and birds?

Ans. Mammals and birds are warm blooded animals. They constantly use energy to maintain their body temperature. They have higher energy needs and require more oxygenated blood for their cells. It is important that their oxygenated blood does not mix up with deoxygenated blood.

3. What are the components of the transport system in highly organized plants?

Ans. Transport system of highly organized plants consists of xylem and phloem.

(i) Xylem- It is used in transport of water and minerals. Xylem is made of tracheids, vessels, xylem fibres and xylem parenchyma. Tracheids and vessels constitute the tracheary elements or channels for transport of water and minerals.

(ii) Phloem- It is used for transport or translocation of organic solutes or food. Phloem consists of sieve tubes, companion cells, phloem fibres and phloem parenchyma. Sieve tubes constitute the channels for the transport of food materials.

4. How are water and minerals transported in plants?

Ans. In xylem tissue, vessels and tracheids of the roots, stem and leaves are interconnected to form a continuous system of water conducting channels reaching all parts of the plant. The root hairs are directly in contact with the film of water in between the soil particles. Water gets into the root hairs by the process of osmosis. At the roots, cells in contact with the soil actively take up ions. This creates a difference in concentration of these ions between the root and the soil. Water, therefore, moves into the root from the soil. Hence, there is steady movement of water into root xylem, creating a column of water that is steadily pushed upwards. Also, water is lost from the aerial parts of plant (transpiration). Evaporation of water molecules from the cells of the leaf creates a suction which pulls water from the xylem cell of roots (the transpiration pull). Thus, transpiration helps in the absorption and upward movement of water and minerals dissolved in it from roots to the leaves.

5. How is food transported in plants?

Ans. The food manufactured by the leaves of a plant is transported to its other parts through the phloem. The transport of food from the leaves to other parts of the plant is called translocation. The movement of material through phloem depends on the action of living cells called sieve tubes. Food molecules enter the phloem elements or cells from mesophyll cells of the leaf.

Once they enter phloem, they can be transported upwards or downwards to all parts of a plant, including roots. This food is transported to different parts of plant in the form of solution through sieve tubes. The end walls of sieve tubes are connected with each other by perforated sieve plates, forming a continuous passage from root tips to stem tips through which dissolved food substances move freely.

The translocation in phloem is achieved by utilizing energy. Material like sucrose is transferred into phloem tissue using energy from ATP. This increases the osmotic pressure of the tissue causing water to move into it. This pressure moves the material in the phloem to tissue which have less pressure. This allows the phloem to move material according to plant's needs.

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

Ans.

	Transport in xylem	Transport in phloem
(A)	It transports water and minerals.	It transports organic nutrients.
(B)	The movement is generally unidirectional.	The movement is multidirectional.
(C)	It is carried out by xylem vessels and tracheids.	Takes place in sieve tubes with the help of adjacent companion cells.
(D)	Major operating forces are diffusion and transpiration pull.	Energy (ATP) is required for translocation.

7. The xylem in plants is responsible for –
 (a) transport of water
 (b) transport of food
 (c) transport of amino acid
 (d) transport of oxygen

Ans. (a) transport of water

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

Ans. Haemoglobin is respiratory pigment. It is present in red blood cells. It carries oxygen to all cells of the body. If deficiency of haemoglobin occurs than -

- (1) It will cause anaemia.
- (2) Oxygen carrying capacity of blood will be reduced.

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

Ans. Double circulation

In double circulation, the blood passes twice through the heart to supply once to the body.

(i) Systemic circulation

In this, blood completes its circulation from left ventricle to right auricle through the body organs.

Oxygenated blood from lungs → left auricle → left ventricle → Aorta → Body parts → Superior vena cava → right auricle.

(ii) Pulmonary circulation

In this, blood completes its circulation from right ventricle to left auricle through the lungs.

Deoxygenated blood from body → right auricle → right ventricle → Pulmonary arteries → lungs → Pulmonary veins → left auricle.

The right portion of heart is known as pulmonary heart, and it has deoxygenated blood. The left portion of heart is known as systemic heart, and it has oxygenated blood.

It is necessary to separate oxygenated and deoxygenated blood. It helps in thermoregulation.