Past Years' Questions

This section contains selected Questions from last 6 years' Board Exams from 2024 to 2019. Different sets of Board Exam papers including compartment papers are covered here.

Very Short Answer Questions (Q.Nos. 1-3)

1. Name the type of blood (oxygenated/ deoxygenated) transported by each of the following mentioning the path (i.e, from one organ (which place) to another (which place). [CBSE 2023]

   (i) Vena cava (ii)Pulmonary artery

Ans. (i) Vena cava transports deoxygenated blood to the heart from the other areas of the body.

(ii) Pulmonary artery transports deoxygenated blood from the heart to the lungs.

2. Why do arteries have thick elastic walls? [CBSE 2021 C]

Ans. Arteries have thick, elastic walls to accomodate the high pressure of oxygenated blood that is pumped from the heart.

3. How is O_2 and CO_2 transported in human beings? [CBSE 2019]

Ans. **Transport of Oxygen**

Haemoglobin transports oxygen molecule to all the cells in the body for cellular respiration. The haemoglobin pigment present in the blood binds to O_2 molecule that are obtained from breathing and thus forms oxyhaemoglobin.

This oxygenated blood is then distributed to all the cells of the body through the heart. After giving away O_2 to the body cells, blood take away CO_2 which is the end product of cellular respiration and the blood becomes deoxygenated.

Transport of Carbon Dioxide

Since haemoglobin pigment has less affinity for CO_2. It is mainly transported in the dissolved form. The deoxygenated blood gives CO_2 to lung alveoli and takes O_2 in return.

Short Answer Questions (Q.Nos. 4-14)

4. Which organisms have a three-chambered heart? Why do they have three-chambered heart? [CBSE 2024]

Ans. Amphibians and reptiles have three-chambered heart (two atria and single ventricle) and possess an incomplete double circulation.

They have three-chambered heart because these animals have a slower metabolic rate and hence require less amount of oxygen per litre of blood.

5. We water the soil, but it reaches the topmost leaves of the plants. Explain in brief the process involved. [CBSE 2024]

Ans. We water the soil, but it reaches the topmost leaves of the plant. The water reaches from the soil to the topmost leaves by following way

(i) **Absorption of water by roots** The root epidermis has numerous fine hair like structures called root hairs. The concentration of the cell sap of the root hairs allow water to be absorbed from the surrounding soil by the process of osmosis.

(ii) **Ascent of sap** The upward transport of water and dissolved minerals through the xylem tissue is called ascent of sap. The continuous influx of water by the root hairs, create a root pressure which helps the water to move inside the inner tissues. Water moves inward through osmosis to reach the xylem. As it reaches the xylem tissue, it is transported upwards by the xylem. Transpiration pull creates a suction pressure due to which water rises through the xylem vessels against gravity. In this way, the water we apply to the soil reaches the topmost leaves.

6. What is lymph ? How is lymph different from blood plasma in composition? List two functions of lymph. [CBSE 2023 C]

Ans. Lymph is a type of fluid found in our body which is involved in transportation. Lymph is different from blood plasma as it is colourless and contains less proteins.

The two functions of lymph are

(i) It carries digested and absorbed fat from intestine.

(ii) It maintains the balance between tissue fluid and blood. It drains excess fluid from extracellular space back into the blood.

7. List four functions of the human heart. Why is double circulation necessary in the human body? [CBSE 2020]

Ans. The functions of the human heart are as follows

(i) Pumping blood

(ii) Maintaining blood pressure

(iii) Ensuring unidirectional blood flow

(iv) Separation of oxygenated and deoxygenated blood

Double circulation in humans is necessary to ensure efficient oxygenation of blood and separation of oxygenated and deoxygenated blood, maintaining high metabolic rates and optimal organ function. This system allows for distinct pulmonary and systemic circuits, providing appropriate pressure and oxygen delivery to the body.

8. Name three kinds of blood vessels of the human circulatory system and write a function of each in a tabular form. [CBSE 2020]

Ans. The three kinds of blood vessels of the human circulatory system and their functions are given below

Blood Vessels	Functions
Arteries	Carry oxygenated blood away from heart to the body tissue (except the pulmonary artery which carries deoxygenated blood to the lungs).
Veins	Return deoxygenated blood from the body tissue back to the heart (except the pulmonary veins which carry oxygenated blood from lungs to the heart).
Capillaries	Facilitate the exchange of oxygen, carbon dioxide, nutrients and waste products between the blood and body tissues.

9. The plants were wilting in a garden and gardener watered the plants. The plants became fresh again. Which part of the p is responsible for conducting water in t how does the process of conduction of water take place in plants? [CBSE 2

Ans. Xylem tissue of the plants is responsible for conducting water in it. The cells in roots that in contact with soil actively take up ions, creating a difference in concentration of ion between the cell sap of roots and soil water.

Water moves into the roots to eliminate this difference of concentration forming a steady movement of water in the root xylem. This creates a column of water that is steadily pu upwards. Loss of water from leaves creates suction, that pulls water from the xylem of t roots to the aerial parts of the plant body.

10. (i) Write two water conducting tissues present in plants. How does water en continuously into the root xylem?

(ii) Explain why plants have low energy needs as compared to animals. [CBSE

Ans. (i) The two water conducting tissue present plants are vessel and tracheids.

Water enter continuously into the root xy through the process called osmosis. The of root in contact with the soil take up wa This creates a difference in concentration between roots and soil. To eliminate this difference steady movement of water tak place into root xylem.

(ii) Plants have low energy needs as compar animals because

- They have stationary lifestyle, reducing energy required for locomotion.
- They have autotrophic nutrition, which less energy-intensive process compare digesting and metabolising food in an

11. List two types of the transport system in human beings and write the functions of any one of these. [CBS

Ans. The two types of the transport system in hu beings are blood vascular system and lymp system.

The blood vascular system has three components-blood, blood vessels and the h Blood is a red-coloured fluid connective tis

which circulates in our body. The tubes through which the blood flows are called blood vessels. There are three main types of blood vessels involved in blood circulation, i.e. arteries, veins and capillaries. Heart is a muscular organ that plays the role of a pump in the circulatory system. Functions of blood vascular system are as follows

(i) Blood helps to maintain proper water balance in the body at a constant required level.

(ii) Blood acts as a buffer system in our body. It helps in the regulation of pH and body temperature.

(iii) Heart pumps blood and oxygen around the body and deliver waste product, i.e. back to the lungs to be removed.

(iv) Arteries carry oxygenated blood from the heart to various organs of the body, except pulmonary artery.

(v) Veins collect deoxygenated blood from different organs of the body and bring it back to the heart, except pulmonary vein.

(vi) Capillaries allow the exchange of materials between blood and tissue.

2 What is transpiration? List its two functions. *[CBSE 2019]*

The loss of water in the form of vapours from the aerial parts of the plants is called transpiration.

The two functions of transpiration are

(i) It helps in the absorption and upward movement of water and minerals dissolved in it, from roots to the leaves.

(ii) It helps in the regulation of temperature.

1 (i) What is translocation? Why it is essential for plants?

(ii) Where do the substances in plants reach as a result of translocation? *[CBSE 2019]*

(i) The transport or movement of soluble products of photosynthesis from leaves to other parts of the plant is termed as translocation. It is essential for the plants to supply food to all parts of the plants. Food is required for producing energy, which in turn is needed by all parts of the plants to perform their activities.

(ii) As a result of translocation the substances reaches to all the parts of plant from leaves.

(i) List in tabular form two differentiating features between xylem and phloem.

(ii) Write two advantages of transpiration in plants. *[CBSE 2019 C]*

Ans. (i)

Xylem	Phloem
Xylem transports water and minerals in plants.	Phloem transports the products of photosynthesis, amino acids and other organic substances in plants.
Movement is unidirectional.	Movement is bidirectional.

(ii) The two advantages of transpiration in plants are

(a) It helps in the regulation of temperature.

(b) It removes excess water from the plant.

Long Answer Questions *(Q.Nos. 15-17)*

15. (i) Plants absorb water from the soil. Explain how it is taken up and transported from the soil?

(ii) "When we are injured and start bleeding, it requires the loss of blood from the system to be minimised." What will happen if the blood loss is not stopped? Is there anything the system would do on its own to prevent the loss? *[CBSE 2021 C]*

Ans. (i) Water and minerals are transported through xylem in plants. The cells in roots that are in contact with soil actively take up ions, creating a difference in concentration of ions between the cell sap of roots and soil water. Water moves into the roots to eliminate this difference of concentration forming a steady movement of water in the root xylem. This creates a column of water that is steadily pushed upwards. Loss of water from leaves creates a suction that pulls water from the xylem of the roots to the aerial parts of the body.

(ii) If the blood loss is not stopped, bleeding would leads to a loss of pressure which would reduce the efficiency of the pumping system. To avoid this, the blood has platelet cells which circulate around the body and plug these leaks and help to clot the blood which prevent the loss.

16. (i) "Blood circulation in fishes is different from the blood circulation in human beings." Justify the statement.

(ii) Describe "blood circulation" in human beings. *[CBSE 2020]*

Ans. (i) Blood circulation in fishes is different from the blood circulation in human beings as fishes have only two-chambers in their heart, while humans have four-chambered heart. In fishes, the blood is pumped to the gills and is oxygenated there and then it is passed to the rest of the body. The blood goes only once through the heart in the fish during one cycle of passage throughout the body. On the other hand, blood goes through the heart twice during each cycle in human beings.

(ii) Blood circulation in human involves the heart pumping oxygenated blood from the left ventricle through arteries to the body and returning deoxygenated blood through veins to the right atrium. The right ventricle then pumps this blood to the lungs for oxygenation. The oxygenated blood returns to the left atrium, completing the cycle.

17. Give reason

(i) Ventricles have thicker muscular walls than atria.

(ii) Transport system in plants is slow

(iii) Circulation of blood in aquatic verte differs from that in terrestrial verteb

(iv) During the daytime, water and mine travel faster through xylem as compa to the night.

(v) Veins have valves, whereas arteries d not. [CBS

Ans. (i) Ventricles have to pump blood throughou body and towards lungs. For this, their w are thicken in order to propel blood out heart with high pressure.

(ii) Transport system in plant is slow becaus simple and is based on physical forces (diffusion, osmosis, transpiration).

(iii) The blood circulation in aquatic vertebra different from terrestrial because these h to absorb O_2 from water through gills an terrestrial vertebrates have lungs for breathing.

(iv) During daytime, due to transpiration pro more water is absorbed by roots due to transpiration pull so absorption is faster daytime.

(v) Veins have valves to prevent backflow of due to less pressure. In arteries, the pres of flow is high.

Competency Based Questions

As per latest Exam Pattern there will be 50% Competency Based Questions (CBQs) in the paper. So w have covered all types of CBQs; Multiple Choice Questions, Assertion-Reason, Case Based and Subjec Questions of competency nature.

Multiple Choice Questions *(Q.Nos. 1-11)*

1. Which of the following statement(s) is/are true about human heart?

I. Right atrium receives oxygenated blood from lungs through pulmonary artery.

II. Left atrium transfers oxygenated blood to left ventricle which sends it to various parts of the body.

III. Right atrium receives deoxygenated b from different parts of the body thro vena cava.

IV. Left atrium transfers oxygenated blo aorta which sends it to different part the body. [CBS

(a) Only II (b) I and IV

(c) II and III (d) II and IV

2. What role does the septum play in the human heart's functionality?
   (a) Regulates blood pressure
   (b) Prevents the mixing of oxygen-rich and oxygen-poor blood
   (c) Produces blood cells
   (d) Controls heart rate

3. In the rhythmic tale of the heart's dance, what serves as the guardian against the backward journey of blood?
   (a) The delicate membranes of the atria
   (b) The robust, muscular fortifications of the ventricles
   (c) The valiant valves within the heart's chambers
   (d) The collective efforts of all the above

4. In humans, the right auricle receives ..... blood from ..... .
   (a) red, left ventricle
   (b) blue, left atrium
   (c) pink, pulmonary artery
   (d) deoxygenated, vena cava

5. How does oxygenated blood travel from the lungs to the left atrium?
   (a) *Via* the vena cava
   (b) Through the pulmonary vein
   (c) By way of the pulmonary artery
   (d) Transported by the aorta

6. Choose the correct statement that describes arteries.
   (a) They have thick elastic walls, blood flows under high pressure; collect blood from different organs and bring it back to the heart
   (b) They have thick elastic walls, blood flows under low pressure; carry blood from the heart to various organs of the body
   (c) They have thick elastic walls without valves inside, blood flows under high pressure and carry blood away from the heart to different parts of the body
   (d) They have thin walls with valves inside, blood flows under low pressure and carry blood away from the heart to various organs of the body

7. How do coronary arteries contribute to the function of the human circulatory system?
   (a) Carry deoxygenated blood to the heart muscle
   (b) Carry deoxygenated blood away from the heart
   (c) Regulate blood pressure in the lungs
   (d) Supply oxygen and nutrients to the heart muscle

8. Opening and closing of stomata is due to *[CBSE 2023]*
   (a) high pressure of gases inside the cells
   (b) movement of water in and out of the guard cells
   (c) stimulus of light in the guard cells
   (d) diffusion of CO_2 in and out of the guard cells

9. How do plants prevent air bubbles from forming and blocking the xylem vessels during water transport?
   (a) By increasing transpiration rates
   (b) By closing stomata
   (c) By using capillary action and cohesion-tension
   (d) By releasing excess water through root hairs

10. What is the secret agenda of transpiration in the world of plants?
    (a) Absorbing water and minerals from the soil
    (b) Transporting sugars from leaves to other parts of the plant
    (c) Regulating gas exchange through stomata
    (d) Loss of water vapour from the leaves

11. The process in which loss of water in the form of vapours from the aerial parts of plants takes place is *X*, which helps in *Y*. Here, *X* and *Y* respectively are *[CBSE 2023]*
    (a) transpiration and photosynthesis
    (b) transpiration and temperature regulation
    (c) translocation and movement of soluble products of photosynthesis in phloem
    (d) translocation and absorption of water and minerals from soil by roots