



INDIAN SCHOOL AL WADI AL KABIR

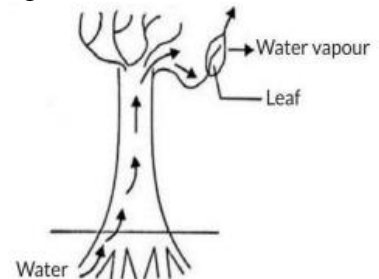


Class: X	DEPARTMENT OF SCIENCE -2024-25 SUBJECT: BIOLOGY	DATE:06.05.2024
WORKSHEET NO:2	TOPIC: LIFE PROCESSES (TRANSPORTATION)	A4 FILE FORMAT (PORTFOLIO)
CLASS & SEC:	NAME OF THE STUDENT:	ROLL NO.

I. A) OBJECTIVE TYPE QUESTIONS:

1. Observe the following diagram and identify the process and its significance from the following options:

- a) Evaporation: maintains water contents in leaf cells.
- b) Transpiration: creates a suction force which pulls water inside the plant.
- c) Excretion: helps in excreting out wastewater from the plant.
- d) Translocation: helps in transporting materials from one cell to another.

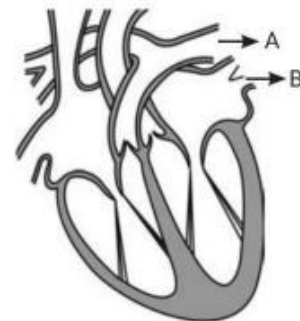


2. The process in which loss of water in the form of vapours from the aerial parts of plants takes place is X, which helps in Y. Here, X and Y respectively are

- 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.

3. Consider the following statements in connection with the functions of the blood vessels marked A and B in the diagram of a human heart as shown.

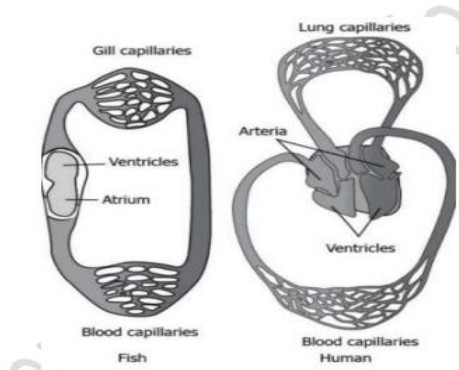
- i) Blood vessel A - It carries carbon dioxide rich blood to the lungs.
- ii) Blood vessel B - It carries oxygen rich blood from the lungs.
- iii) Blood vessel B - Right atrium relaxes as it receives blood from this blood vessel.
- iv) Blood vessel A - Right atrium has thick muscular wall as it must pump blood to this blood vessel.



The correct statements are:

- a) (i) and (ii) only
- b) (ii) and (iii) only

- c) (ii), (iii) and (iv)
 d) (i), (ii) and (iii)
4. Which one of the following statements is correct about the human circulatory system?
 a) Blood transports only oxygen and not carbon dioxide.
 b) The human heart has five chambers.
 c) Valves ensure that the blood does not flow backwards.
 d) Both oxygen-rich and oxygen-deficient blood gets mixed in the heart.
5. The correct pathway of blood in the circulatory system is
 a) Ventricles → atria → veins → arteries.
 b) atria → veins → arteries → ventricles.
 c) atria → ventricles → arteries → veins.
 d) ventricles → veins → arteries → atria
6. The image shows the circulation of blood in fish and humans.



- How is the circulation of blood in fish different from that in humans?
- a) The flow of blood in fish is unidirectional.
 b) The heart of fish has more chambers compared to that of a human.
 c) The blood goes through heart only once in fishes.
 d) The heart in fish is bigger in size.
7. The blood leaving the tissues becomes richer in
 a) carbon dioxide
 b) water
 c) hemoglobin
 d) oxygen
8. Coagulation of blood in a cut or wound is brought about by:
 a) plasma
 b) platelets
 c) WBC
 d) RBC

9. The blood goes only once through the heart in _____ during one cycle of passage through the body.
- Amphibians
 - Fishes
 - Reptiles
 - Aves
10. _____ ensure that blood does not flow backward when the atria or ventricles contract.
- Arteries
 - Veins
 - Valves
 - Capillaries
11. The liquid part of the blood is called.
- Matrix
 - Lymph
 - Plasma
 - Stroma
12. The chamber of heart having most thick walls is:
- Left atrium.
 - Right atrium
 - Left ventricle.
 - Right ventricle
13. The xylem in plants is responsible for
- Transport of minerals
 - Transport of food
 - Transport of amino acids
 - Transport of oxygen

I. B) ASSERTION AND REASONING TYPE

For the following questions, two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (i), (ii), (iii), and (iv) as given below.

- Both A and R are true and R is the correct explanation of the assertion.*
- Both A and R are true but R is not the correct explanation of the assertion.*
- A is true but R is false.*
- A is false but R is true*

14. **Assertion:** Arteries are thick walled and elastic in nature.

Reason: Arteries must transport blood away from the heart with pressure.

15. **Assertion:** Plants have low energy needs.

Reason: Plant bodies have a large proportion of dead cells.

16. **Assertion:** Valves are present in the arteries.

Reason: Arteries carry oxygenated blood from the heart to different body parts except pulmonary artery.

17. **Assertion (A):** Human heart is four-chambered.

Reason (R): Vena cava is the only artery that supplies deoxygenated blood to the heart.

II. VERY SHORT QUESTIONS (2M):

18. Why do ventricles have thicker, muscular walls than atria?

19. What is the fluid part of the blood called? Which blood cell is responsible for clotting blood?

20. Why do veins have valves?

21. What are capillaries? State the function performed by them.

III. SHORT ANSWER TYPE QUESTIONS (3M):

22. Name the three components of the circulatory system?

23. Give reasons for the following. (a) Arteries are thick walled. (b) Blood goes only once through the heart in fishes (c) Plants have low energy needs.

24. a) “Transport of food in plants requires living tissues and energy”. Justify this statement.

b) Name the components of food that are transported by living tissues.

25. Differentiate between process of transport of water and minerals and food in xylem and phloem.

26. Differentiate between the blood vessels arteries and Veins.

IV. LONG ANSWER TYPE QUESTIONS (5M):

27. a) Draw a sectional view of the human heart and label on it – Aorta, Right ventricle, and Pulmonary veins.

b) State the functions of the following components of transport system:

i) Blood

ii) Lymph

28. i) What is double circulation? Describe double circulation with the help of a diagram.

ii) Why is the separation of the right side and the left side of the heart useful? How does it help birds and mammals?

29. a) Plants absorb water from the soil. Explain how it is taken up and transported from the soil.

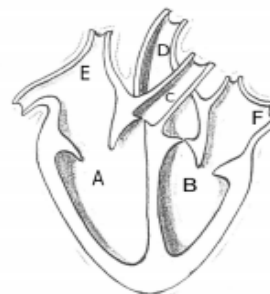
b) Explain giving any three reasons the significance of transpiration in plants.

30. a) Explain in detail the transportation of water and minerals in plants?

b) Why is translocation of food in phloem called as active transport?

V. BOARD BASED QUESTIONS.

31. i) Identify any two parts from the diagram given which carry oxygenated and deoxygenated blood.
 ii) Explain the process of double circulation with the help of a flow chart.



32. What Process in Plant is known as Transpiration?
 33. What would be the consequences of deficiency of haemoglobin in your body?

VI. CASE-BASED/SOURCE BASED QUESTIONS.

Read the given passages carefully answer the questions:

- i) The heart is a muscular organ which is as big as our fist. Because both oxygen and carbon dioxide must be transported by the blood, the heart has different chambers to prevent the oxygen-rich blood from mixing with the blood containing carbon dioxide. The carbon dioxide-rich blood has to reach the lungs for the carbon dioxide to be removed, and the oxygenated blood from the lungs has to be brought back to the heart. This oxygen-rich blood is then pumped to the rest of the body.
- How many chambers are present in the heart of mammals and reptiles?
 - What do you mean by the term double circulation?
 - If diffusion were to move oxygen in our body, it is estimated that it would take three years for a molecule of oxygen to reach our toes from our lungs. How do transport of oxygen and carbon dioxide take place in human?
- ii) Plant transport systems will move energy stores from leaves and raw materials from roots. These two pathways are constructed as independently organised conducting tubes. One, the xylem moves water and minerals obtained from the soil. The other, phloem transports products of photosynthesis from the leaves where they are synthesised to other parts of the plant.
- What are the different parts of xylem?
 - What do you mean by the term transpiration?
 - What are the advantages of transpiration?

ANSWERS (HINTS)

1.	b) Transpiration: creates a suction force which pulls water inside the plant.
2.	b) transpiration and temperature regulation
3.	a) (i) and (ii) only
4.	c) Valves ensure that the blood does not flow backwards.
5.	c) atria → ventricles → arteries → veins
6.	c) The blood goes through heart only once in fishes.
7.	a) carbon dioxide
8.	b) platelets
9.	b) Fishes

10.	c) Valves
11.	c) plasma
12.	c) Left ventricle
13.	a) Transport of minerals
	<u>ASSERTION AND REASONING:</u>
14.	a) Both A and R are true and R is the correct explanation of the assertion.
15.	a) Both A and R are true and R is the correct explanation of the assertion.
16.	d) A is false but R is true.
17.	c) A is true but R is false.
	<u>II. SHORT ANSWER TYPE I</u>
18.	Since ventricles have to pump blood into various organs, they have thicker muscular walls than atria do.
19.	Plasma, platelets
20.	To prevent back flow of blood
21.	Smallest vessels/ which have one cell thick wall. They exchange of material between the blood and the surroundings.
	<u>III. SHORT ANSWER TYPE II</u>
22.	The human circulatory system consists of blood, heart and blood vessels, (explanation of each)
23.	(a) To withstand high pressure of the blood (emerging from the heart). (b) Because they do not maintain their own body temperature, therefore, they do not require separation of oxygenated and deoxygenated blood (which allows efficient supply of oxygen)/they have low energy needs. (c) Because plant bodies have a large proportion of dead cells (in many tissues)
24.	(a) Food is transported by sieve tubes through energy food moves into sieve tube at the expense of ATP. Due to increase in osmotic pressure, water enters into the tissues. Due to this pressure material moves from phloem to tissue. (b) Components are: (i) Photosynthetic products or sucrose. (ii) Amino acids
25.	Xylem transport – transport of water and minerals, unidirectional and passive Phloem transport – transport of food, bidirectional and active
26.	Arteries – thick walled, no valves, carry blood from heart, blood flows under high pressure Veins – thin walled, valves are present, carry blood to heart and blood flows under low pressure
	<u>IV. LONG ANSWER TYPE</u>
27.	Heart -Figure-6.10, page- 106 i) Blood <ul style="list-style-type: none"> • Transport of oxygen to the tissues for the breakdown of digested food and carbon dioxide to the lungs by the blood plasma. • Transport of digested and absorbed nutrients to the tissues and nitrogenous wastes are transported to the kidneys. • It regulates the body temperature and maintains the pH of the body tissues. • It maintains water balance to constant level.

	<ul style="list-style-type: none"> • It helps in rapid healing of wounds by forming a clot at the site of injury. <p>ii) Lymph</p> <ul style="list-style-type: none"> • It cleans the cellular environment. • It returns proteins and tissue fluids to the blood. • It provides a pathway for the absorption of fats and fat-soluble vitamins into the bloodstream. • It defends the body against disease.
<p>28.</p>	<p>a) Double circulation—As blood passes twice through heart in a single circulation, the circulation is called double circulation. Right auricle receives deoxygenated blood from various body parts through major veins. At the same time pulmonary vein brings oxygenated blood to left atrium. During this event auricles and ventricles both remain in relaxed state. Some blood passes to the respective ventricles since the auriculo-ventricular valves between auricle and ventricle are open. Once the auricles are full with blood they contract and the blood passes into left and right ventricles. Now the valve between auricle and ventricle closes and ventricles contract to pump blood. Deoxygenated blood present in right ventricle goes to lungs through pulmonary artery and oxygenated blood is distributed to all parts of the body through the largest artery called aorta. From various parts of body deoxygenated blood again returns to right auricle and oxygenated blood from lungs to left auricle.</p> <div data-bbox="722 966 1039 1270" data-label="Diagram"> </div> <p>b) Because unlike fishes, birds and mammals are warm blooded. They have high-energy needs; this separation allows a highly efficient supply of oxygen to release energy continuously.</p>
<p>29.</p>	<p>a) The plants absorb water from the soil with the help of root hair through osmosis. The diffusion of water molecules through a semi-permeable membrane is called osmosis. Root hair absorbs water from soil through osmosis. Water will be absorbed by root hairs by osmosis as the environment in the soil is hypotonic.</p> <p>b) Significance of transpiration in plants:</p> <ol style="list-style-type: none"> 1. It conducts water and mineral salts to different parts of the plant body. 2. It maintains the osmosis and turgidity of the cells. 3. It helps in the upward movement of water. 4. During transpiration hydrophilic salts get collected on the surface of the leaves, keeping the leaves moist. 5. Optimum transpiration is good for the proper growth of plants. 6. It gives a cooling effect.

30.	<p>a) Water and minerals are transported in plants with the help of xylem tissue. Roots absorb the water from the soil by actively taking up ions, creating the difference in the concentration of these ions between the root and the soil. Water enters the root cells. Movement of water and minerals is due to root pressure (root absorbs water and exerts a pressure which pushes the water upwards) The water moves up creating a column of water that is steadily pushed upwards in vessels and tracheid of the roots, stem, and leaves, and are interconnected to form a continuous system of water-conducting channels reaching all parts of the plant. The water loss by leaves through stomata is called transpiration. It creates a suction pressure or transpiration pull, which pulls water from the xylem cells of roots.</p> <p>b) Translocation of food is called an active process because it requires energy to push the food from the cells in the leaves to the sieve tube. The source of this energy is ATP. On the other hand, transportation of water and minerals is a passive process which takes place with the help of physical processes.</p>
31.	<p>i) Oxygenated: B/D/F [B= left ventricle/D=aorta/F=left auricle/pulmonary vein] Deoxygenated: A/C/E [A= right ventricle/C= pulmonary artery/E=right auricle/vena cava] (any two)</p> <p>ii) The oxygenated blood from the lungs returns to the heart, which is pumped again into different parts of the body by the heart. Thus, the blood passes twice through the heart making one complete round through the body. This is called double circulation. Flow chart – double circulation</p>
32.	<p>The loss of water in the form of water vapour from the aerial parts of the plants is called transpiration.</p>
33.	<p>The deficiency of hemoglobin in our body is called anemia. In anemia, the blood is unable to carry enough oxygen required by the body. So, respiration would be less and less energy will be available to the body. The hemoglobin deficient person will feel weak, pale, lethargic and will be unable to perform heavy physical work.</p>
<p><u>V. CASE-BASED/SOURCE BASED QUESTIONS.</u></p> <p>i) a) Mammals- 4 chamber heart and reptiles- 3 chambered heart b) Blood goes through the heart twice during each cycle known as double circulation. c) Blood contains respiratory pigment hemoglobin which has high affinity for oxygen. Oxygen binds with hemoglobin and is then carried to various body parts through blood circulation. In the tissue region oxygen diffuses from blood to the tissue. Carbon dioxide is more soluble in water than oxygen is and hence is mostly transported in the dissolved form in our blood.</p> <p>ii)</p> <ol style="list-style-type: none"> vessels, Tracheids, xylem parenchyma and fibres. The loss of water in the form of vapour from the aerial parts of the plant. <ol style="list-style-type: none"> help in the absorption and the upward movement of water temperature regulation 	

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