

	INDIAN SCHOOL AL WADI AL KABIR	
Class: X	DEPARTMENT OF SCIENCE -2026-27 SUBJECT: BIOLOGY	DATE: 05/05/26
WORKSHEET NO:3	TOPIC: LIFE PROCESSES TRANSPORTATION AND EXCRETION	A4 FILE FORMAT (PORTFOLIO)
CLASS & SEC:	NAME OF THE STUDENT:	ROLL NO.

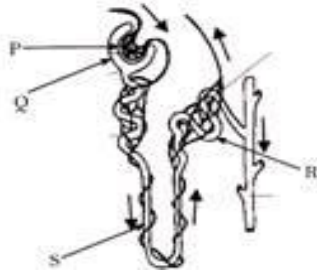
I. MULTIPLE CHOICE QUESTIONS:

1. One-cell-thick blood vessels are known as:
 - A. Alveoli
 - B. Capillaries
 - C. Arteries
 - D. Veins
2. Select TRUE statements about lymph from the following:
 - a) Lymph vessels carry lymph through the body and finally open into large arteries.
 - b) Lymph contains some amount of plasma, proteins, and blood cells.
 - c) Lymph contains some amount of plasma, proteins, and red blood cells.
 - d) Lymph vessels carry lymph through the body and finally open into larger veins.
 - A. (a) and (b)
 - B. (b) and (d)
 - C. (a) and (c)
 - D. (c) and (d)
3. Select the correct option from the following statements about the functioning of the human heart:
 - A. Right atrium receives deoxygenated blood from different parts of the body and sends it to pulmonary veins.
 - B. Left atrium sends oxygenated blood to right ventricle which pumps it to different parts of the body.
 - C. Right atrium receives deoxygenated blood from the body and sends it to the right ventricle.
 - D. Left atrium receives oxygenated from the pulmonary arteries and sends it to the left ventricle.
4. The basic filtration unit of the excretory system in human beings is:
 - A. Nephron
 - B. Urethra

- C. Neuron
- D. Urinary bladder

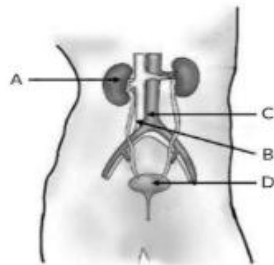
5. Which one of the following letters represents a glomerulus?

- A. Q
- B. P
- C. R
- D. S



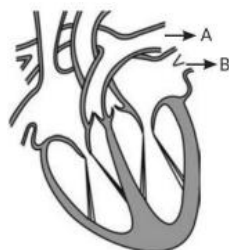
6. In the given diagram, A, B, C, and D respectively are:

- A. A - Left kidney; B - Aorta; C - Vena cava; D – Urethra
- B. A - Left kidney; B - Vena cava; C - Aorta; D - Urinary bladder
- C. A - Right kidney; B - Aorta; C - Ureter; D – Urethra
- D. A - Right kidney; B - Vena cava; C - Aorta; D - Urinary bladder



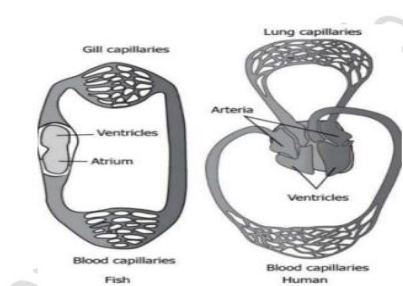
7. Consider the following statements in connection with the functions of the blood vessels marked A and B in the diagram of a human heart as shown.

- 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 - Left 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)
8. 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 bidirectional.
 - B. The heart of a fish has more chambers compared to that of a human.
 - C. The blood goes through the heart only once in fish.
 - D. The heart in fish is bigger in size.



9. Which one of the following is not a function of an artificial kidney?
- A. To remove nitrogenous wastes from the blood.
 - B. To remove excess fluids from the blood
 - C. To reabsorb essential nutrients from the blood
 - D. To filter and purify the blood.
10. Identify the two components of phloem tissue that help in transportation of food in plants.
- A. Phloem parenchyma and sieve tubes
 - B. Sieve tubes and companion cells
 - C. Phloem parenchyma and companion cells
 - D. Phloem fibres and sieve tubes

II. ASSERTION AND REASONING:

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.

- i) Both A and R are true and R is the correct explanation of the assertion.
- ii) Both A and R are true but R is not the correct explanation of the assertion.
- iii) A is true but R is false.
- iv) A is false but R is true

11. **Assertion(A):** Xylem tissue moves water and minerals obtained from the soil by the roots.

Reason(R): Xylem tissue is found only in the roots of a plant.

12. **Assertion(A):** Blood plasma transports carbon dioxide in dissolved form, while oxygen is transported by respiratory pigments.

Reason(R): Carbon dioxide is more soluble in water than oxygen.

13. **Assertion(A):** Hemodialysis can save the life of patients with kidney failure.

Reason(R): Waste products like urea can be removed from the blood by hemodialysis.

14. **Assertion (A):** The human heart is four-chambered.

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

III. TWO MARK QUESTIONS:

15. Besides minimising the loss of blood, why is it essential to plug any leak in a blood vessel? Name the component of blood which helps in this process and state how this component performs this function.

16. i) The transport system in plants is relatively slower than in animals. Give reasons.

ii) State the role of phloem in the transport of materials in plants.

17. Write one specific function of each of the following organs in relation with excretion in human beings: (i) Renal Artery (ii) Urethra (iii) Glomerulus (iv) Tubular part of nephron.

18. Name the structural and functional unit of the kidney? Name any two parts of it.

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

IV. THREE MARK QUESTIONS:

20. a) Enlist any two nitrogenous waste products removed from the blood of human kidney.

b) Name the capillary cluster formed by the branch of renal artery in the Bowman's capsule.

c) Depict in the form of a flow chart the path of the urine formed in each kidney until it is finally passed out through the urethra.

21. Why is blood circulation in vertebrates known as "double circulation"? Trace its path in the form of a flow chart.

22. What are nephrons? How is nephron involved in the filtration of blood and formation of urine?

23. 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.

V. FIVE MARK QUESTIONS:

24. 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.
25. a) Explain in detail the transportation of water and minerals in plants?
b) Why is translocation of food in phloem called as active transport?
26. a) Draw a diagram of human excretory system and label the following:
i) part that carries urine from the bladder to outside of the body
ii) part which transports the urine out of the kidney
iii) The blood vessel which brings nitrogenous waste to the kidney
iv) The part where urine is stored temporarily before it is excreted off the system.
b) How is the amount of urine produced regulated?

VI. PASSAGE BASED QUESTIONS:

27. Our body needs to remove the wastes that is built up from cell activities and from digestion. If these wastes are not removed, then our cells can stop working and we can get very sick. The organs of excretory system consist of a pair of kidneys, a pair of ureters, a urinary bladder, and a urethra. Each kidney is made up of nearly one million complex tubular structures called nephrons. The formation of urine involves various processes that take place in the different parts of the nephrons. Each nephron consists of a cup- shaped upper end called Bowman's capsule containing a bunch of capillaries called glomerulus. Bowman's capsule leads to tubular structure, proximal convoluted tubule, loop of Henle and distal convoluted tubule which ultimately join the collecting tubule.

A. What are nephrons? Name their parts.

B. Name the main nitrogenous waste product in human beings. In what form is it excreted out of the body?

C. Name the substances which are selectively reabsorbed as the urine flows along the tube.

OR

D. Why is it important for the body to remove wastes?

28. 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.

A. How many chambers are present in the heart of mammals and reptiles?

B. What do you mean by the term double circulation?

C. 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?

OR

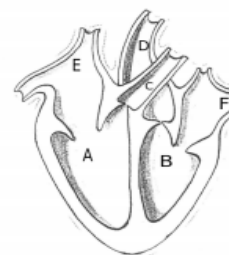
D. What is meant by oxygenated and deoxygenated blood?

VII. **BOARD QUESTIONS:**

CBSE 2023

29. Name the blood vessel that brings (i) oxygenated blood (ii) deoxygenated blood, to the human heart. Also name that chamber of the heart which receives deoxygenated blood and state how deoxygenated blood from this chamber is sent to lungs for oxygenation.
2023

30. 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.
CBSE 2024



31. What Process in Plant is known as Transpiration? CBSE 2024

32. What would be the consequences of deficiency of hemoglobin in your body? CBSE 2025

33. (a) "Transport of food in plants require living tissues and energy". Justify this statement.

(b) Name the components of food that are transported by the living tissues. CBSE 2025

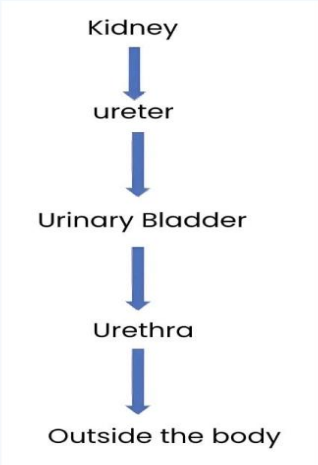
ANSWER KEY

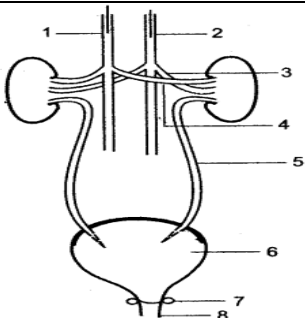
Q. No	
MULTIPLE CHOICE QUESTIONS	
1.	B. Capillaries
2.	B. (b) and (d)
3.	C. Right atrium receives deoxygenated blood from the body and sends it to the right ventricle.
4.	A. Nephron
5.	C. R
6.	D. A - Right kidney; B - Vena cava; C - Aorta; D - Urinary bladder
7.	D. (i), (ii) and (iii)
8.	C. The blood goes through heart only once in fishes.
9.	C. To reabsorb essential nutrients from the blood
10.	B. Sieve tubes and companion cells
ASSERTION AND REASONING:	
11.	iii) A is true but R is false
12.	i) Both A and R are true and R is the correct explanation
13.	i) Both A and R are true and R is the correct explanation
14.	iii) A is true but R is false

TWO MARK QUESTIONS:

15.	Ans: (a) It is essential to plug any leak in a blood vessel to prevent blood loss and maintain blood pressure so that oxygen and nutrients can continue to reach all parts of the body. The component of blood that helps in this process is platelets. Platelets release certain enzymes that help in the clotting of blood, forming a clot or scab at the site of injury, thereby sealing the wound and preventing further bleeding.
16.	(b) (i) The transport system in plants is slower than in animals because: - Plants do not have a pumping organ like the heart. - The movement of materials in plants depends mainly on physical processes such as diffusion, osmosis, and transpiration pull. (ii) The phloem transports the prepared food (sucrose) from the leaves (source) to other parts of the plant (sink) like roots, fruits, and storage organs - a process known as translocation.
17.	i. Renal Artery: It provides oxygenated blood to the kidney muscles. ii. Urethra: Urine can pass through this tube and leave the body. iii. Glomerulus: It serves as a blood filter by removing the nitrogenous wastes from the blood. iv. Tubular part of nephron: The necessary salts and water content from the filtered blood are absorbed and reabsorbed with its assistance. As a result, they preserve the blood's osmolarity.
18.	Nephron, Bowman's capsule and PCT
19.	Smallest vessels which have one cell thick wall. They exchange of material between the blood and the surroundings.

THREE MARK QUESTIONS:

20.	(a) Two nitrogenous waste products removed from the blood by human kidneys are urea and uric acid. (b) The capillary cluster formed by a branch of the renal artery in the Bowman's capsule is called the glomerulus. (c) Flow chart showing the path of urine:  <pre> graph TD A[Kidney] --> B[ureter] B --> C[Urinary Bladder] C --> D[Urethra] D --> E[Outside the body] </pre>
21.	Ans: Blood circulation in vertebrates is called double circulation because the blood passes through the heart twice during one complete cycle - once for oxygenation and once for supplying oxygenated blood to the body. This ensures efficient separation of oxygenated and deoxygenated blood.
22.	Nephrons are the microscopic, functional units of the kidney responsible for filtering blood, balancing electrolytes, and forming urine. Each kidney contains over a million nephrons, which cleanse blood and regulate body fluid balance. Nephrons produce urine via three main processes: glomerular filtration , tubular reabsorption , and tubular secretion .
23.	(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
<u>FIVE MARK QUESTIONS:</u>	
24.	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. b) Significance of transpiration in plants: 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. It gives a cooling effect.
25.	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. 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.
26.	i) Urethra – 8 ii) Ureter – 5 iii) Renal Artery - 3 iv) Urinary bladder - 6  The diagram shows a frontal view of the human urinary system. Label 1 points to the right kidney, 2 to the left kidney, 3 to the renal artery, 4 to the renal vein, 5 to the ureter, 6 to the urinary bladder, 7 to the urethra, and 8 to the external urethral orifice. b) The total amount of urine produced in humans is regulated by the presence of: - The total amount of water. - The total amount of dissolved nitrogenous wastes is present in the urine. Certain hormones that help in controlling the movement of water and sodium ions into and out of the nephrons.
<u>PASSAGE BASED QUESTIONS</u>	
27.	A) The basic structural and functional units of kidneys which filter the waste from blood and urine are called nephrons. B) Urea is the main nitrogenous waste. It is excreted out in the form of urine. C) Glucose, amino acids, salts, and a major amount of water are selectively re-absorbed as the urine flows along the tube. OR D) It is important for the body to remove wastes because waste substances like urea, carbon dioxide, and other toxic materials can become harmful if they remain in the body. If these wastes are not removed: They may poison the cells, can disturb normal body functions
28.	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. OR D) Oxygenated blood is blood that is rich in oxygen and is carried from the lungs to the heart and then to the body. Deoxygenated blood is blood that is rich in carbon dioxide and is carried from the body to the heart and then to the lungs.
<u>BOARD QUESTIONS:</u>	
29.	Ans: (i) The blood vessel that brings oxygenated blood to the heart is the pulmonary vein. (ii) The blood vessel that brings deoxygenated blood to the heart is the vena cava (superior and inferior vena cava). The right atrium of the heart receives deoxygenated blood from all parts of the body through the vena cava. From the right atrium, the blood passes into the right ventricle, which then pumps the deoxygenated blood to the lungs for oxygenation through the pulmonary artery.
30.	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) 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
31.	The loss of water in the form of water vapour from the aerial parts of the plants is called transpiration.
32.	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 would be available to the body. The hemoglobin deficient person will feel weak, pale, lethargic and will be unable to perform heavy physical work.
33.	(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.

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