Transportation

Improve your learning

Q. 1. What is transport system? How does this help to the organism? (AS1)

Answer : a. First, let's understand what transport system in day to day life. You might have seen goods such as grains, cements, fruits, and clothes are being transported by road, rail, ships, and airplanes regularly.

b. A lot of waste material is produced in our homes, in shops, and in industries. These should be transported to far off place for disposal.

c. Therefore, if the transport system fails, then it will be difficult to manage our daily needs.

d. Similarly, transport systems are present in the organisms to keep the organisms alive and healthy.

e. The system which transports the materials from where they are produced and the place where they are needed is called transport system.

f. Cells of our body too require various substances to live, grow and carry out their life processes.

g. The transport system supplies nutrients and substances such as glucose, amino acids, fatty acids, vitamins, and minerals.

h. All these substances are obtained from the food we eat and water we drink.

i. To supply all these materials, we need a transport system.

j. Oxygen is required for the food to be oxidized. Oxygen is taken into the lungs from here it should be transported to every cell in the body. Carbon dioxide produced during oxidation process should be collected and transported to the lungs for elimination.

k. The various waste materials such as urine, feces, sweat, carbon dioxide are produced in the cells are to be transported to various sites in the body for disposal.

Q. 3. Which type of blood vessels carry blood away from the heart? (AS1)

Answer : a. The pulmonary arteries carry blood away from the heart to the lungs.

b. The pulmonary arteries are the only arteries that carry deoxygenated blood.

c. The pulmonary arteries starts as one artery that branches off the front middle part of the heart, in front of the aorta.

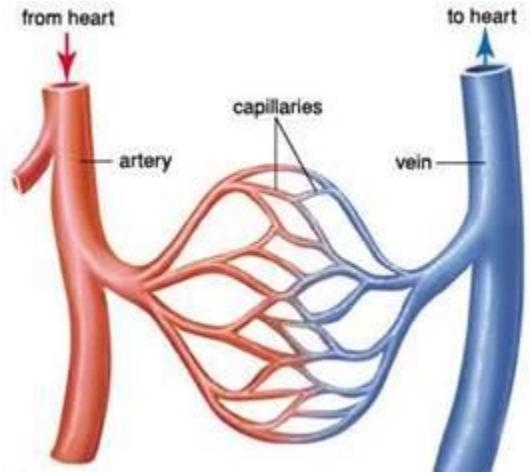
Q. 4. What are the three main types of blood vessels in the body? (AS1)

Answer : a. There are three major types of blood vessels.

b. The arteries, which carry the blood away from the heart, except pulmonary artery.

c. The capillaries, which very thin and provides the site for exchange of water and chemicals between the blood and the tissues.

d. The veins, which carry blood from the capillaries back to the heart.



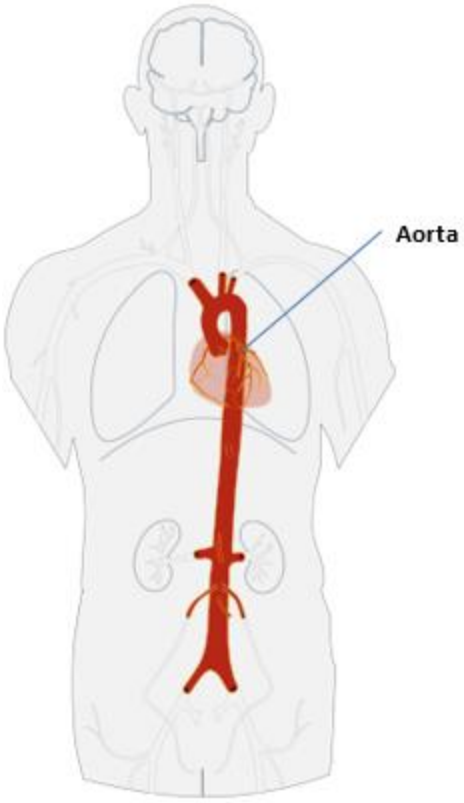
Q. 5. Which is the largest artery in the body? Why is it big in size? (AS1)

Answer : a. Aorta is the largest artery in the body.

b. It comes right out of the heart and supplies the blood to the whole body. It is very large diameter, approximately the size of circle with your index and thumb.

c. It is big in size because heart pumps all the oxygenated blood to the aorta

d. The largest vein is the inferior cava vein, which collects all blood from the entire body below the arms and leads it back to the heart.



Q. 6. Which blood vessel carries blood for oxidation? (AS1)

Answer : a. It is the 'pulmonary artery' which carries deoxygenated blood to the lungs for oxidation from the right ventricle of heart.

b. It is the only artery in the whole body to carry deoxygenated blood.

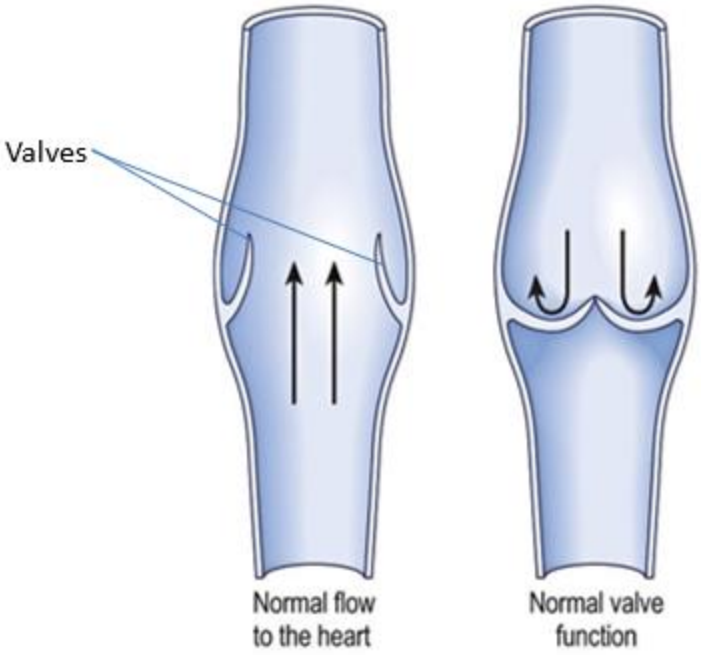
c. All other arteries carry oxygenated blood from lungs to the heart.

Q. 7. Name the structures which are present in veins and lymph ducts and absent in arteries. (AS1)

Answer : a. Veins are less muscular than arteries.

b. Veins are located close to the skin.

c. There are valves in most veins and lymph ducts. The valves prevent backflow of blood.



Q. 8. What is the use of platelets? (AS1)

Answer : a. Platelets are tiny blood cells.

b. There are 150,000-350,000 platelets per microliter of blood.

c. Platelets help our body form clots to stop bleeding, when blood vessels get damaged.

Q. 9. Write differences between (AS1)

A. systole – diastole B. veins – arteries C. xylem – phloem

Answer : A.

Systole	**Diastole**
It is the phase of the heart beat when the heart contracts and pumps blood into the aorta.	It is the phase of the heart beat when the heart relaxes and allows the chamber to fill with blood
Systole increases pressure in the arteries	During diastole, the blood pressure in the arteries is at low.

B.

Veins	Arteries
Carry blood from the body tissues to the heart.	Carry blood away from the heart to the tissues of the body.
They are located beneath the surface of the skin.	They are usually located deeper within the body.
less muscular than arteries, but contain valves to check back flow	More muscular than veins, which helps in transporting blood, no valves present.

C.

Xylem	Phloem
Xylem is a conducting tissue, consists of vessels, tracheid parenchyma and sclerenchyma.	Phloem is a conducting tissue, consists of sieve tubes, companion cells parenchyma and sclerenchyma.
It conducts water and minerals from roots to other parts of the plant.	It conducts synthesized food from leaves other parts of the plant.

Q. 10. Explain the way how plants get water by osmosis through root hair? (AS1)

Answer : a. Roots have root hairs, hair-like structures.

b. Root hairs are extended into the pore spaces of the soil. .

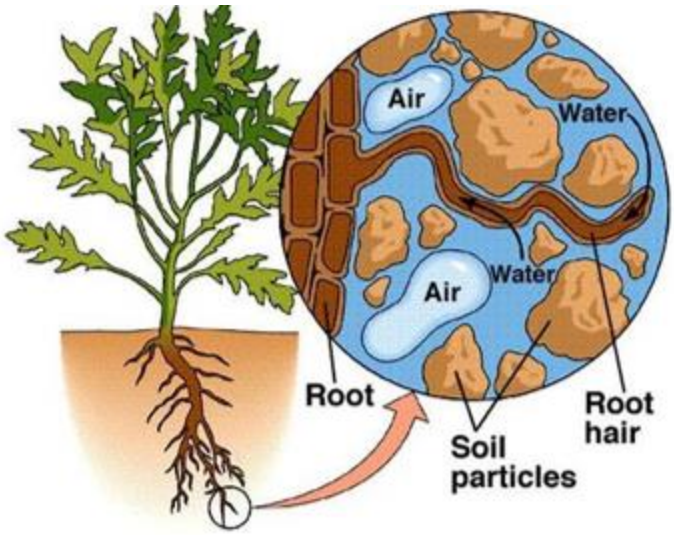
c. The soil water is dilute solution than the cell sap of root hair cells.

d. Therefore, water will move into the vacuole of the root hair by osmosis.

e. The entry of water dilutes the contents of the root hairs vacuoles so that it becomes more dilute than its neighboring cells.

f. Water passes into the neighboring cell and finally, water enters the xylem, a conducting tissue.

g. A pressure in the xylem vessels develops which forces the water upwards.



Root hairs absorb water from the soil

Q. 11. What is root pressure? How is it useful to the plant? (AS1)

Answer : a. The pressure exerted by the water molecules and absorbed by root hairs is called root pressure.

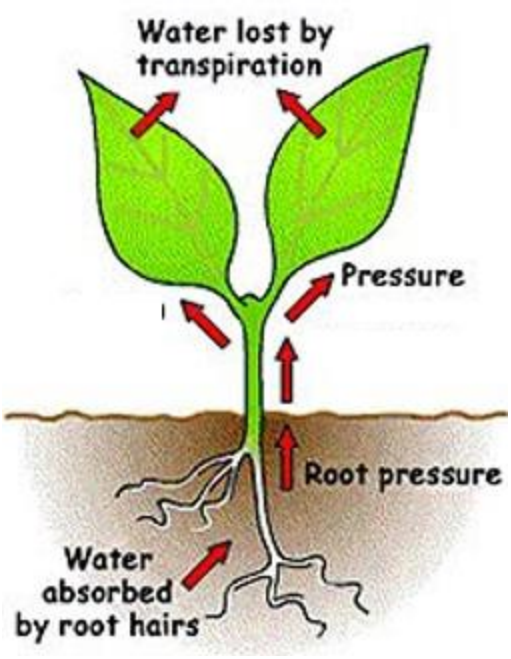
b. Root pressure can push water upwards for few meters. This is enough to supply water from roots to leaves in herbaceous plants such as tomato, mustard, cabbage, small bushy plants.

c. The cell membrane of root hair is a semipermeable membrane and separates the cell sap (contents of the vacuole) from the water in the soil.

d. As a result, water flows from the soil into the cell sap from root hairs. Thus, roots absorb water and salts from the soil.

e. The absorbed water and salts will move to the next cell by osmosis.

f. Root pressure develops due to the absorption of water by roots and pushes the water upwards by few meters and is enough to supply water to leaves in small plants and small trees.



Q. 12. Phloem is a food source for some animals. How can you justify this statement? (AS1)

Answer : a. The food (carbohydrates) in the plants is synthesized in the leaves.

b. The synthesized food is needed by each and every parts of the plants.

c. Phloem, a conducting tissue which conducts food from leaves to other parts of a plant.

d. To transport food by the phloem has been done by an experiment, by removing a ring of bark from the shoot to expose the wood.

e. Remove all tissues from the center outwards including the phloem.

f. So, any damage to the phloem all around the stem will prevent food from passing down to the roots and the tree will eventually die.

g. Certain mammals scratch the bark of trees to get at the food stored in the phloem, especially during hard winters when food is scarce.

Q. 13. Read the given para and name the parts of the heart. (AS1)

We have observed that the heart is divided into four chambers by muscular structure. Any structure that divides two chambers is known as the *septum.*Now let us try to name the septa present in the heart.

A. The septum that divides the two atria can be named as *inter atrial septum*
B. The septum that divides the two ventricles can be named as _____.
C. The septum that divides the atrium and ventricle can be named as _____.
The holes that connect two chambers are called *apertures.* Let us try to name the apertures which connect the atria and ventricles.
D. The aperture that is connecting the right atrium and right ventricle can be named as _____.
E. The aperture that is connecting the left atrium and left ventricle can be named _____.
Any structure that closes an aperture and allows one-way movement of materials is called as a *valve.* Now let us name the valves that are present in the chambers of the heart.
F. The valve that is present between the left atrium and left ventricle can be named as _____.
G. The valve that is present between the right atrium and right ventricle can be named as _____.

Answer : A. Inter atrial septum.

It is the tissue that separates the right atrium from the left atrium in the heart.

B. Inter ventricular septum.

It is the strong wall that separates the right and the left ventricles in the heart.

C. Inter atrial ventricular septum

It is the muscular septum which separates auricles and ventricles.

D. Right atrioventricular aperture

It is an aperture that connecting the right atrium and right ventricle.

E. Left atrioventricular aperture.

It is an aperture that connecting the left atrium and left ventricle.

F. Bicuspid (Mitral) valve.

The valve between the left atrium and left ventricle of the heart.

G. Tricuspid valve

The valve consisting of three cusps situated between the right atrium and right ventricle of the heart.

Q. 14. If the valves in veins of the legs fail to stop the flow of blood, what could be the consequences of this failure? (AS2)

Answer : a. Due to presence of valves in the veins the blood in the leg veins only move towards the heart.

b. They check backflow of blood. If the valves in veins of the legs fail to stop flow of blood, the blood accumulates in the veins and causes swelling or inflammation.

c. The blood pressure increases and possibly causing more damage.

d. The swelling of the veins also results in varicose veins and spider veins.

e. If varicose veins are untreated for long time, it leads to venous ulceration.

Q. 15. What will happen if cell sap of root hair cells contain a high concentration of ions? (AS2)

Answer : a. The cell membrane of root hair is a semi-permeable membrane.

b. It allows the movement of water from its higher concentration (in soil water) molecules to its low concentration (as in cell sap) as in this case.

c. The root hair cells contain a high concentration of ions and salts as compared to soil water. As a result, soil water will move into the cell sap of root hairs.4

Q. 16. John prepared stethoscope with a paper cup and plastic tube. Write down the procedure of preparation. (AS3)

Answer : a. Material required to make stethoscope are Paper cups and string.

b. To make stethoscope, Take paper cup which is in the shape of funnel and size of 6-7 cm.

c. Fix a rubber tube at narrow end of the paper cup.

d. Then fix the paper cup in shape with the help of an elastic string.

e. Put the pen end of the cup on your chest and the rubber tube in your ear and you can hear the heart beat

Q. 17. How can you prove that the water is transported through the xylem? (AS3)

Answer : To prove that the water is transported through the xylem a plant. Set Apparatus as shown.

i. Procedure:

Take a leafy green shoot of Balsam plant with a transparent stem and place it in Eosin solution (It is red dye resulting from the action of. bromine).

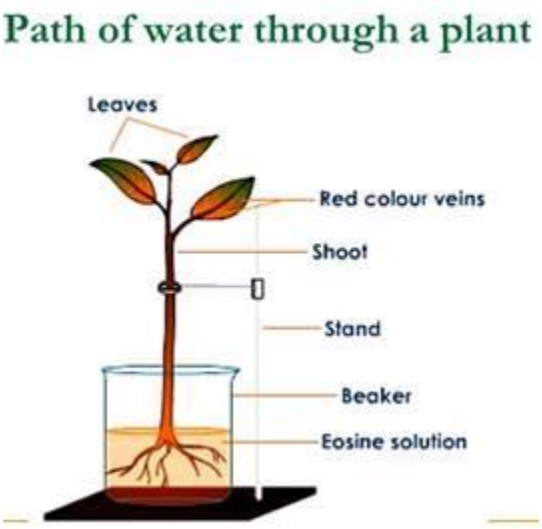
ii. After sometime red streaks appear in the stem and veins of leaves become red.

iii. If a transverse section is cut through the root stem and leaf, the tissue that has been stained is xylem tissue.

iv. This shows that water moves up the root into the stem and leaves in the xylem tracheid and vessels.

v. The other tissues remain in the same colour.

Conclusion: The xylem tissue is the conducting tissue that conducts water from roots to the other parts of plants. .



Q. 18. What is your inference about experiments with aphids? (AS3)

Answer : a. Aphids are green flies clustering round the young stems of plants.

b. They feed on plant juices.

c. An aphid has long needle like organ called ‘proboscises which it pierces in the plant tissues.

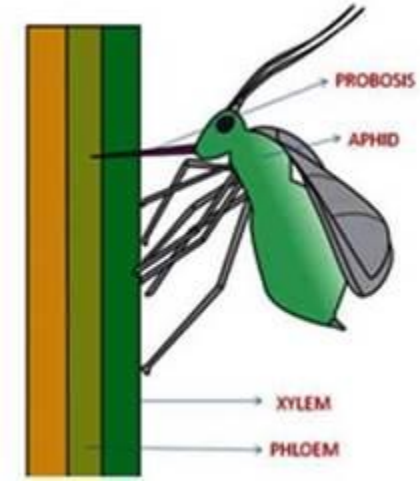
d. To make an inference, an aphid is killed while in the act of feeding and the body is removed, leaving the hollow proboscis inserted into the phloem.

e. It is found that the fluid slowly coming out from the proboscis in the form of drops.

f. These drops are then collected and analyzed.

g. The fluid is found to contain sugars and amino acids.

h. It is, therefore, inferred that food is transported in the phloem cells.



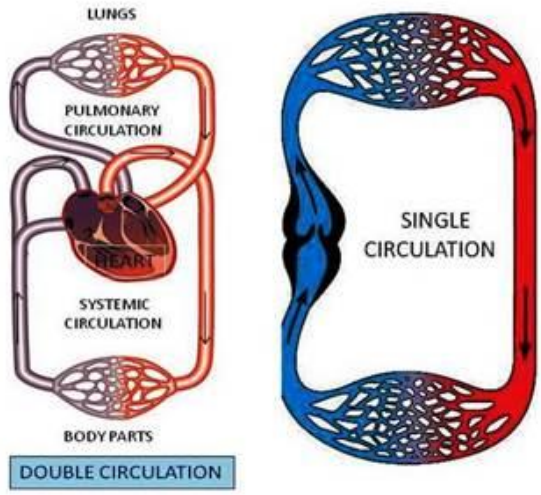
Q. 19. Collect information about blood pressure of your school teachers or your neighbors prepare a report on their health problems. (AS4)

Answer :

Name	Blood pressure (in mm Hg)	Health related issues
B P Singh	120/80	Normal
S K Sharma	125/85	Feel irritation, worried
Mr. Rao	140/90	Fear, get angry easily, irritated, look tired.
Mrs. Puri	110/70	Weakness, dizziness, fainting

Q. 20. Draw a block diagram to explain single and double circulation. Write differences between them. (AS5)

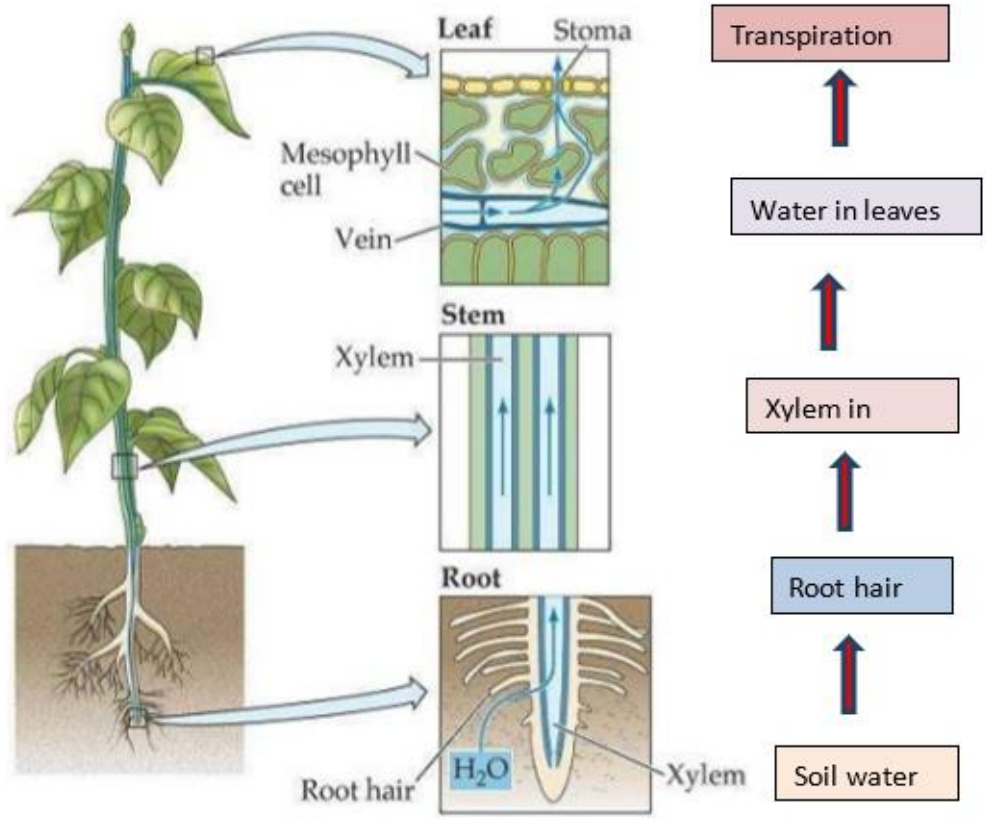
Answer :



The main difference between single circulatory systems and double circulatory systems is that in the case of single circulatory systems, blood passes through the heart only once, whereas in double circulation blood passes through heart twice.

Q. 21. Prepare a block diagram showing water absorption by roots to transpiration by leaf. (AS5)

Answer :



Q. 22. What do you want to compare with the transportation in blood vessels in man? (AS6)

Answer : a. Transportation of blood in blood vessels can be compared with the transportation of water by xylem and food material by phloem in plants.

b. Heart pumps oxygenated blood into aorta. Aorta divides into arteries and arterioles and distributes oxygenated blood to all the body parts and ends with capillaries.

c. Veins begin with capillaries. These form into venues, these join to form into veins.

d. All these veins join to form superior and inferior vena cava. These large veins collect deoxygenated blood from body parts and bring to the heart.

e. Heart pumps deoxygenated blood to lungs by pulmonary artery for oxygenation and this oxygenated blood is sent to heart by pulmonary veins to heart.

f. The blood transportation is compared to transportation in plants.

g. Similarly root hairs absorb water and mineral salts from soil.

h. The water then enters into xylem and transported to the stem and leaves by transpiration pull.

i. From the leaves the water lost in the form of water vapours. Loss of water is called transpiration.

j. Transpiration promotes absorption of water by roots.

Q. 23. How do you feel about transportation of water in huge trees? (AS6)

Answer : a. Water is absorbed by root hairs. From root hairs, enters into xylem due to root pressure.

b. Root pressure can push water upwards by not more than a few meters.

c. The magnitude of root pressure is less, and can push water from roots to leaves in small herbaceous plants.

d. However there are huge trees, as tall as 120 m high.

e. In such trees, water has to be pushed several meters upwards against earth's gravitational pull.

f. Water is absorbed by root hairs and is passed into the xylem vessels which form a continuous system of tubes through root and stem into the leaves.

g. About 98% of absorbed water is lost in the form of water vapours from the stomata present in the leaves.

h. This process is called transpiration. The transpiration creates the main pull in the xylem column.

i. As a result movement of water is continued in a continuous column from the site of absorption to the site of loss. In this way water go up to the very tall trees such as eucalyptus.

Q. 24. Prepare a cartoon on heart beating? (AS7)

Answer :

Q. 25. After reading this lesson what precautions you would suggest to your elders about edema. (AS7)

Answer : Edema is a condition in which there is accumulation of fluid in the interstitial cells which is located beneath the skin or one more cavities of the body. It causes swelling in the body parts. Generally this occurs in elders due to their inactive nature. The following methods are recommended by healthcare professionals

i. Compression stocking: It reduces the fluid buildup and improves circulation.

ii. Movement: Sitting and standing for too long promotes the fluid flow into the legs specially travelling to long distances. Leg exercise increases circulation while preventing fluid retention in the legs and feet moving and using the leg muscles helps pump excess fluid back to the heart.
People with swollen feet or legs, shall keep the legs elevated above the level of heart for 30 minutes a day or 3 or 4 times a day.

iii. Low salt diet: Taking low salt diet can prevent or reduce swelling. Reducing the amount of salt including table salt in the diet may prevent swelling problems from reoccurring.

iv. Avoid temperature changes: Temperature changes to very hot or cold can make edema worse. This can happen when going from hot outdoors into an air conditioner building or vice versa. Avoid hot baths, hot showers when swelling occurs.

v. Diuretics, medications help increase urine output, excrete water and sodium.

Choose the correct Answer

Q. 1. Choose the correct answer

The term cardiac refers to which organ in the body?

A. heart
B. vein
C. lymph
D. capillary

Answer : Cardiac is a term related to the heart.

Q. 2. Choose the correct answer

On which side of the human heart is low in oxygen?

A. left ventricle
B. right ventricle
C. left atrium
D. right atrium

Answer : Deoxygenated blood from the body parts low in oxygen is received in the right atrium.

Q. 3. Choose the correct answer

Which structures of the heart control the flow of the blood? ( )

A. arteries
B. veins
C. valves
D. capillaries

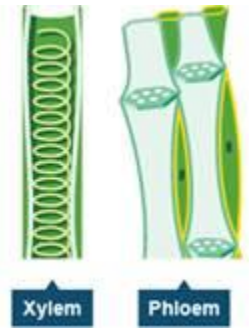
Answer : The valves prevent the backward flow of blood.

Q. 4. Which of the following opinion is correct? ( )

A. Ravi said, xylem and phloem cells arranged one upon the other to form a tube like structure.

B. John said, xylem and phloem are not separate tube like structures.
C. Salma said, xylem and phloem cells connect together to form a tube like structure.
D. Hari said, because of its shape they said to be tube like structures

Answer : Hari said, because of its shape they said to be tube like structures



Xylem vessel and phloem sieve tubes are tube like structures.

Q. 5. An aphid pierces is proboscis into the…….to get plant juices.

A. Xylem
B. phloem
C. cambium
D. vascular bundle

Answer : Phloem conducts food, therefore, an aphid pierces is proboscis into the phloem to get plant juices.