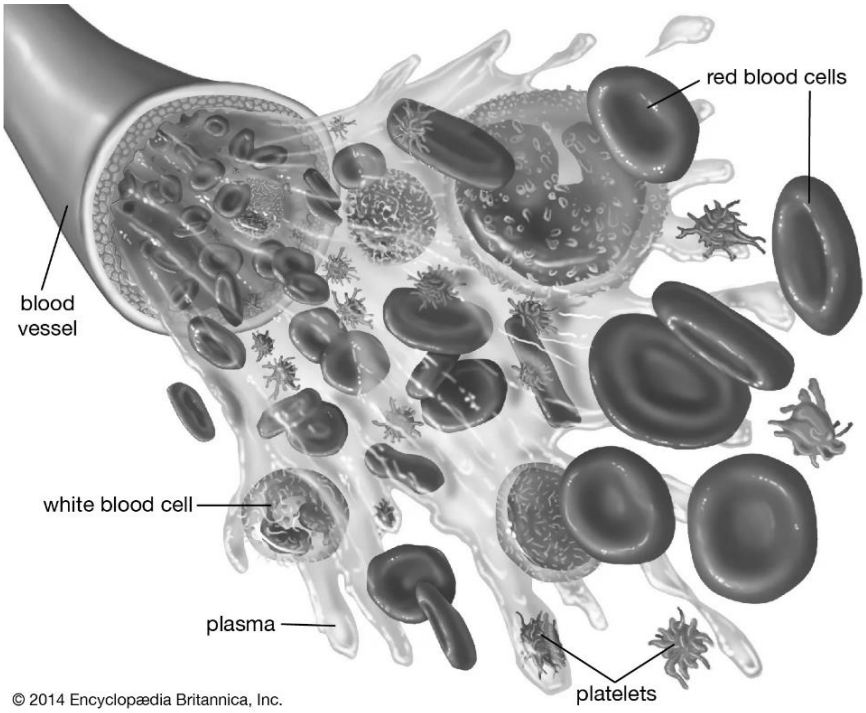
G. Answer the following questions in brief:

Q1. What are the functions of white blood cells and platelets in blood?

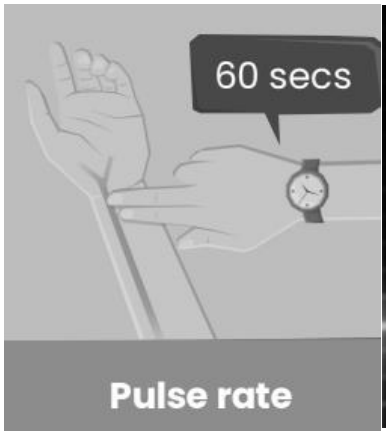


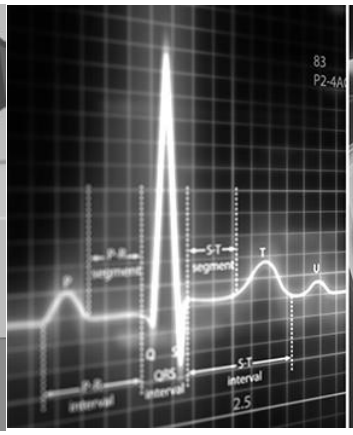
Answer: ***White Blood Cells protect us*** against ***illness and disease***. They flow through our bloodstream to ***fight viruses, bacteria, and other foreign invaders*** that ***threatens our health***.

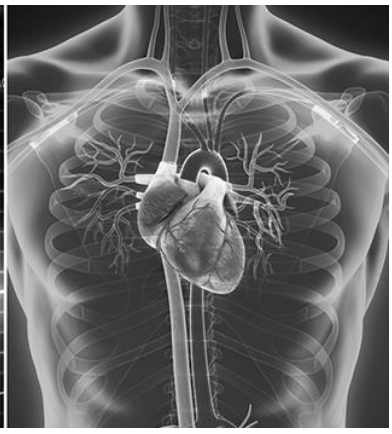
Platelets work by ***prevent and stop bleeding*** by forming clots.

Q2. What is difference between heart beat and pulse?

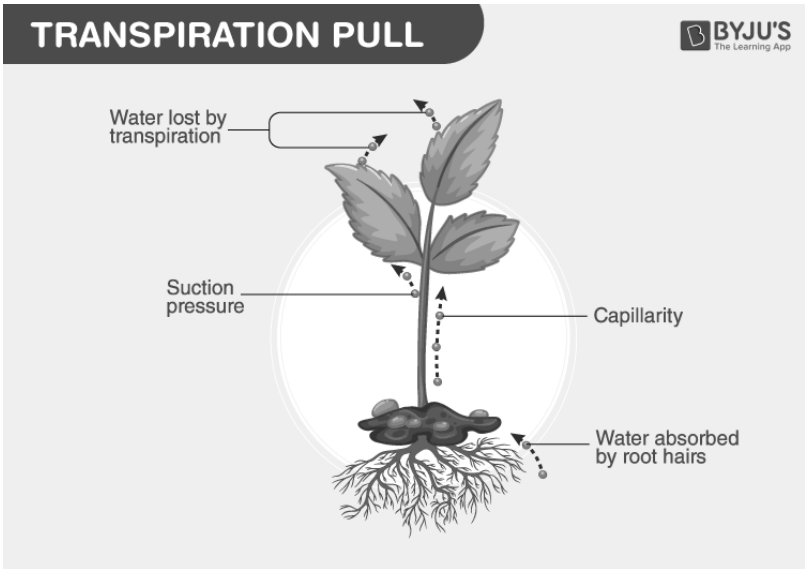
Answer: There's a connection between your heart rate and your pulse, but they aren't the same. Your ***heart rate (heart beat)*** is ***how fast your heart is beating at a given time***. Your ***pulse is how you can feel your heart rate (heart beat)***. ***Pulse rate measures*** the rate of ***blood pressure***. A ***pulse rate*** is generally defined as the ***number of heart beats per minute***.







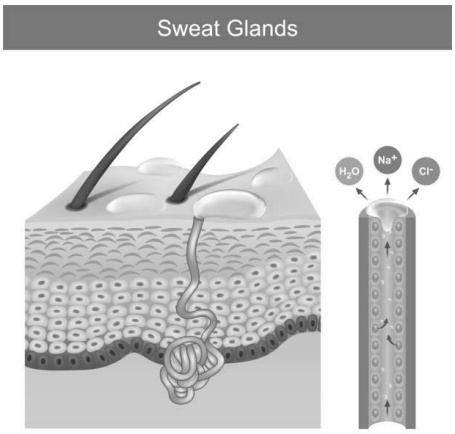
Q3. In what way does transpiration help in ascent of sap?



Answer: ***The upward movement of water and minerals in a plant through xylem is called ascent of sap.***

Transpiration helps in the ascent of sap by producing a ***suction force acting from the bottom*** of the plant. With the increase in transpiration , the ascent of sap also increases.

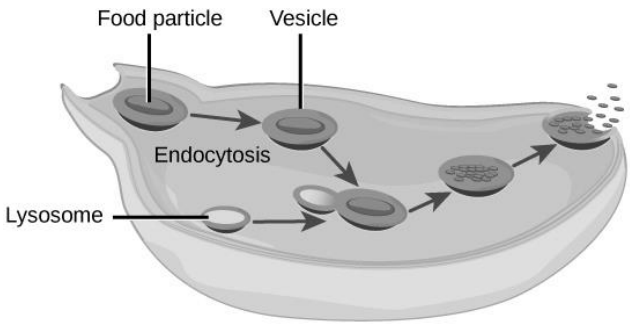
(The movement of water and minerals from roots to all the other parts of the plant is referred to as the ascent of sap.)



Q4. Why is sweating important for human body?

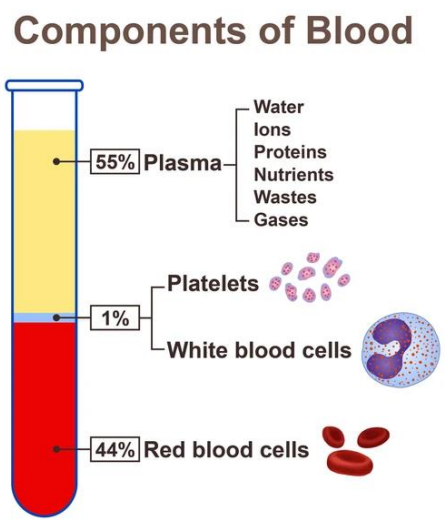
Answer: It allows the water to evaporate from the skin which results in loss of body heat. Hence, it removes excess heat from the body. Also, it makes the skin wet. Due to this, the skin feels cooler.

Q5. How do aquatic organism and single-cell organisms excrete their waste?



Answer: In unicellular organisms, since they do not have any specialized organs for the removal of waste materials, their wastes are removed directly through the cell membrane by the process of diffusion. In addition, the salts in the water they continually drink are excreted by special cells in their gills.

H. Answer the following questions in detail:



Q1. What is blood? What are the functions of blood in the body?

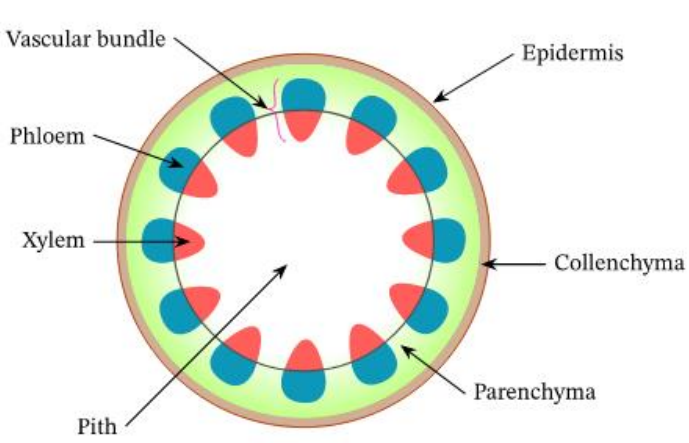
Answer: Blood is a fluid connective tissue containing plasma, red blood cells (RBC), white blood cells (WBC), and platelets.

Our blood is made up of liquid and solids. The liquid part, called plasma, is made of water, salts, and protein. Over half of your blood is plasma. The solid part of your blood contains red blood cells, white blood cells, and platelets

Functions of Blood:

1) ***Transporting oxygen and nutrients to the lungs and tissues.***
2) ***Forming blood clots to prevent excess blood loss***.
3) Carrying cells and antibodies that fight infection.
4) ***Bringing waste products to the kidneys and liver***, which filter and clean the blood.
5) ***Regulating body temperature.***
6) ***Transportation of oxygen from the lungs to the tissues***.
7) ***Transportation of digested food*** from the ***small intestine to the tissues and cells*** around the body.
8) Supplying the ***waste products to the kidneys and liver***, which filter and clean the blood.
9) Supplies ***oxygen and nutrients to the tissues*** and ***removes carbon dioxide and waste from the blood.***
10) It also helps to ***maintain adequate blood pressure throughout the body.***

Q2. What is vascular system? Explain the differences between tissues of vascular system.



Answer: ***Vascular system*** is ***complex conducting tissues*** in ***higher plants*** that are ***made up of Xylem and Phloem.*** These tissues ***are responsible for the transport of water and nutrients in the plants***.

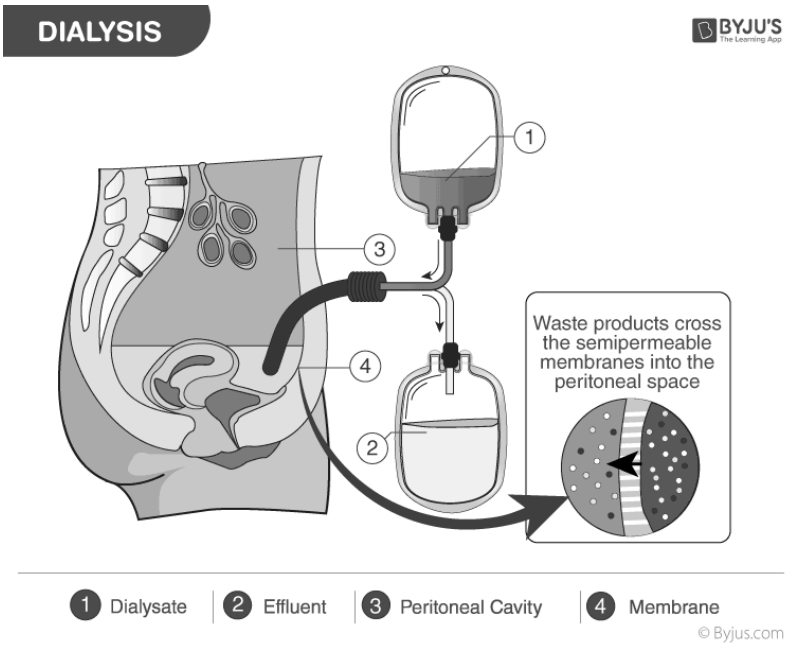
Difference Between Xylem and Phloem Tissue:

Parameter	Xylem	Phloem
Meaning	Xylem is the complex tissue of plants that helps in the transportation of water and nutrients in the plant.	Phloem refers to the living tissue which helps in the transportation of food and organic materials in the plant.
Type of Cell	It consists of dead cells	It mostly contains living cells.
Location	The xylem is located deeply in the plant in the center of the vascular bundle.	The phloem is located on the outermost side of the vascular bundle of the plant.
Type of Movement	Xylem is unidirectional.	Phloem is bidirectional.
Xylem and Phloem functioning	The xylem helps in the transportation of both water and minerals from the roots.	The phloem helps in the transportation of food that is prepared by the green parts of the plants.
Proportion of Plant	Xylem mostly contains the bulk of the plant body.	Phloem consists of a small portion of the plant body.

(Just like the veins and arteries carry blood in our human body, plants also have similar types of vessels. Xylem and phloem are the major vessels present in the plant body)

Q3. What is dialysis? How is Diabetes Mellitus different from Diabetes Insipidus?

Answer: ***Dialysis*** is the ***process of removal of the excess waste material from blood.*** It the ***artificial process of filtering blood, which is done to remove the nitrogenous waste products*** that can ***result in toxicity inside the system.***



Diabetes Mellitus:

Most commonly, the food we eat is turned into glucose or sugar, which the body uses as energy.

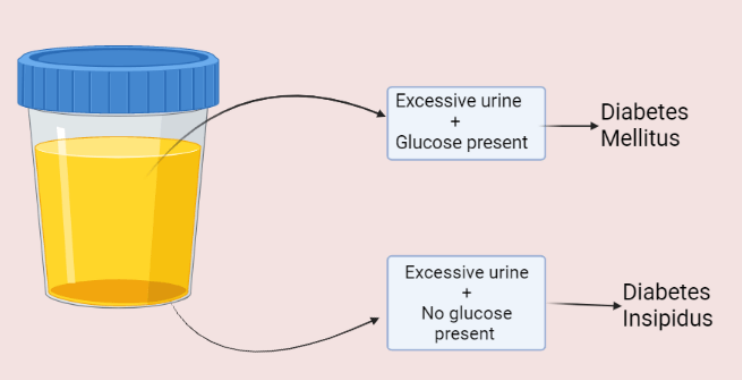
A hormone called insulin, released by the pancreas, helps glucose get into the cells of our bodies.

If the pancreas cannot release sufficient insulin, it results in the rise of glucose levels in the blood.

This condition of rise in glucose level is called Diabetes Mellitus or simply Diabetes.

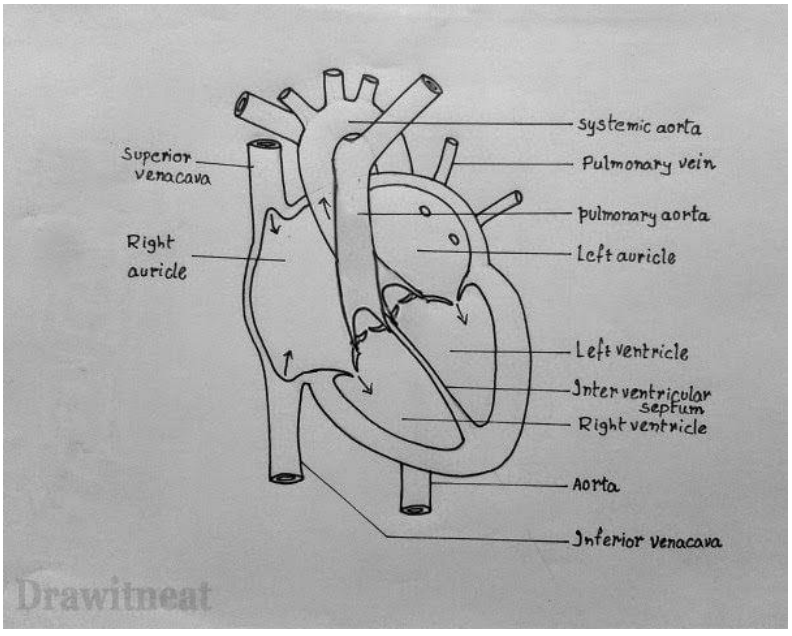
Diabetes Insipidus:

Diabetes Insipidus is ***a condition*** in which the ***kidney produces abnormally large volumes of dilute and odourless urine***. Patients with diabetes insipidus ***can pass 20 litres of urine per day***. Diabetes insipidus is a rare condition that has nothing to do with the pancreas or blood sugar.



Q4. Draw a neat labelled diagram of human heart and explain its functions?

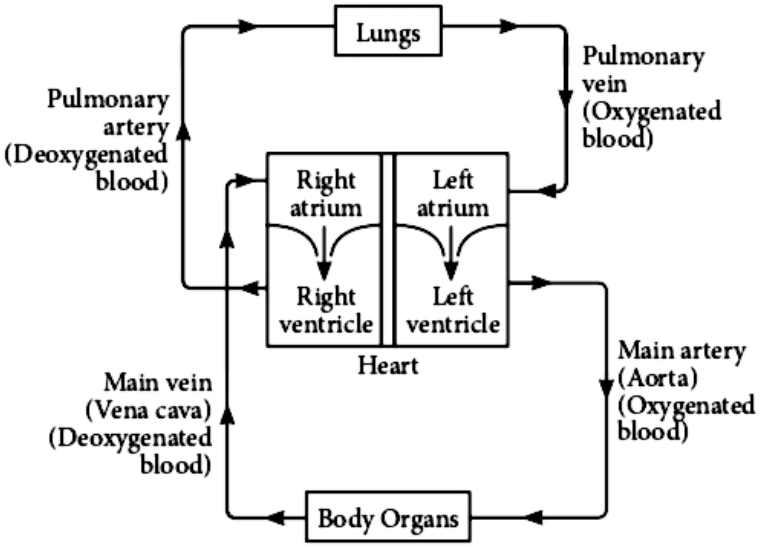
Answer:



The heart is an organ which beats continuously to act as a pump for the transport of blood, which carries other substances with it.

The ***heart pumps the deoxygenated blood to the lungs for oxygenation*** and ***receives oxygenated blood from lungs.*** It ***pumps the oxygenated blood to different parts of the body***

Blood Circulation:

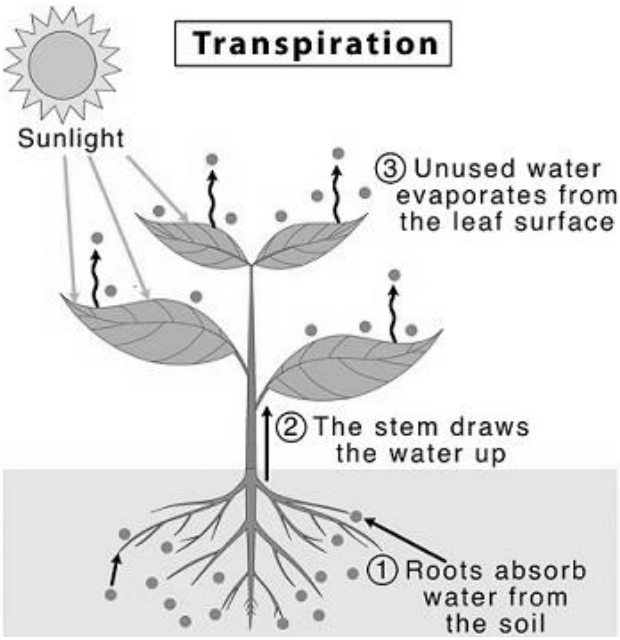


- The heart is divided into four chambers and has valves that allow the blood to flow in one direction only.
- The upper two chambers with relatively thin walls are called atria.
- The two lower chambers with thick muscular walls are called ventricles.
- The figure shows the complete circulatory system in the body.
- The right atrium receives carbon dioxide-rich blood from the various parts of the body and is then moved into the right ventricle.
- The right ventricle pumps the blood to the lungs, where carbon dioxide is removed and oxygen is absorbed.
- The left atrium receives oxygen-rich blood as it comes back to the heart from the lungs and is pushed into the left ventricle.
- The left ventricle pumps this blood to the rest of the body.
- The right side of the heart is completely separated from the left side with the help of a partition called the septum. This prevents the mixing of oxygenated and de-oxygenated blood.

(Functions of Heart:

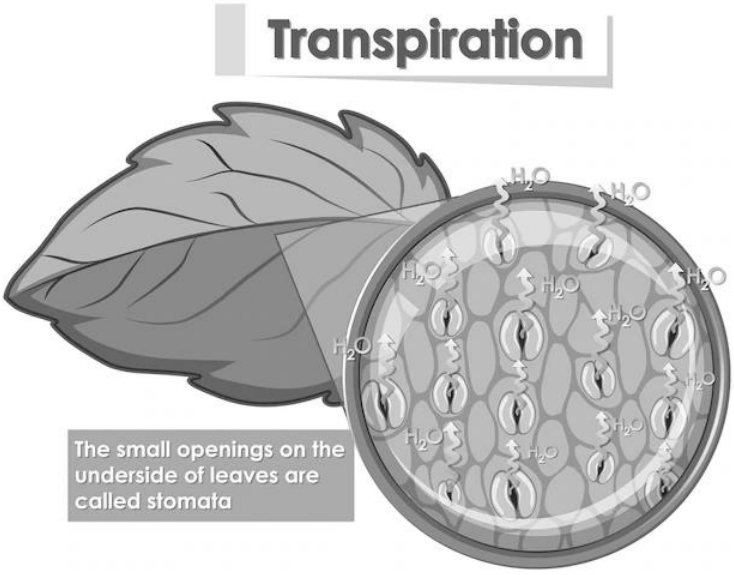
- The heart's primary function is to pump blood throughout the body.
- It supplies oxygen and nutrients to the tissues and removes carbon dioxide and waste from the blood.
- It also helps to maintain adequate blood pressure throughout the body.
- Heart pumps the blood throughout the body, hence playing an important role in maintaining body temperature.
- Blood delivers oxygen, hormones, glucose and other components to various parts of the body, including the human heart.
- It supplies oxygen and nutrients to the tissues and removes carbon dioxide and waste from the blood.)

Q5. How is transpiration useful to plants?



Answer: ***Transpiration is the process of loss of water through the stomata present on the leaves of plants***. Stomata are the minute openings present on the lower epidermis of the leaf surface. These ***stomata help plants in exchange of gases as it allows carbon dioxide*** to enter the interior of the leaf and ***allow oxygen to exit during the process of photosynthesis***.

Some of the important functions of transpiration in plants are:



- It helps in ***maintenance of cell turgidity*** and it also ***helps in cell division***.

- It helps in ***maintenance of water within the plant*** as water is eliminated from the plant continuously.

- ***The cooling effect of trees is because of transpiration.***

- It ***cools down the surface of the leaves.***

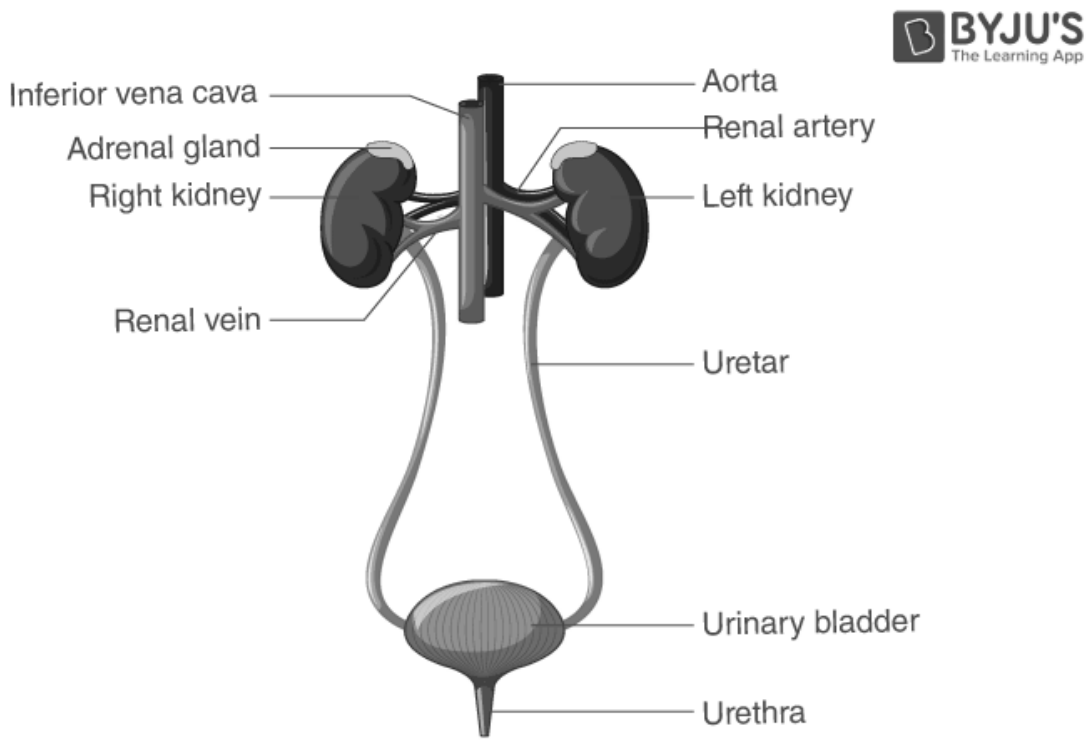
- It also helps in growth and development.

- ***It regulates the temperature of the plants.***

- It ***allows the movement of water and minerals*** from the ***soil*** to ***different parts of the plant***.

Q6. Draw a diagram for of human excretory system. Explain the function of different organs of the human excretory system?

Answer: Human excretory system:



(a) In humans, the ***excretory system*** consists of ***a pair of kidneys***, ***a pair of ureters, urinary bladder*** and ***urethra***.

(b) ***Kidneys*** are ***two bean shaped organs*** lying at the back of the abdomen, one on either side of the vertebral column. ***Waste products from the blood and urine are removed by the kidney.***

(c) ***A Nephron is the basic filtration unit of the kidney***. It is a cluster of thin walled blood capillaries. ***Capillaries of kidneys filter the blood*** and ***the essential substances*** like ***glucose, amino acids, salts, and the required amount of water get reabsorbed*** and the blood goes into circulation. ***Excess water and nitrogenous waste in humans are converted to urine.***

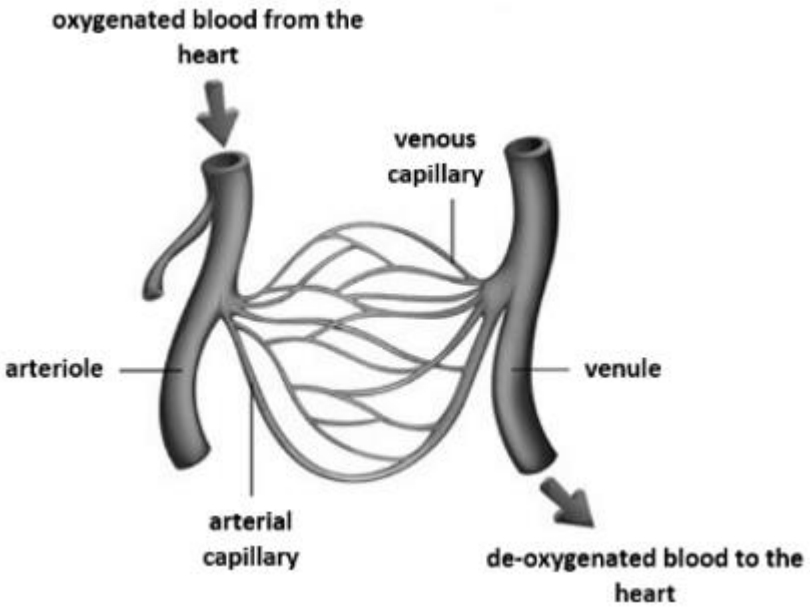
(d) The ***urine produced by filtering the blood*** is transported to the ***urinary bladder***. This is ***done by a pair of ureters***. Ureters are long muscular tubes.

(e) ***Urinary bladder is a muscular bag like structure which can hold urine.*** The urinary bladder is under the control of nerves. When the bladder is full one get urge to urinate.

(f) This ***urine is thrown out of the body through urethra***.

(g) Apart from the kidney, the skin and lungs are also helpful in the excretion.

Q7. What are the blood vessels? How are the arteries, veins and capillaries different from each other?



Answer: ***Blood vessels are tubular structures present throughout the body in which blood flows.***

There are ***three main types of blood*** vessels namely ***arteries, veins, and capillaries.***

(The human body possesses roughly 60,000 miles of blood vessels)

Arteries carry blood from the heart to different parts of bodies.

Blood here ***flows in high pressure***, so they are ***thick-walled***. All arteries except pulmonary artery carry oxygenated blood.

(Arteries carry blood away from your heart. Located deep in the muscle)

Veins carry blood from different parts of the body to the heart. They are ***thin-walled*** than arteries. Except for the pulmonary vein, all veins carry deoxygenated blood.

(Veins carry blood back toward your heart. Veins stretch over from 60, 000 to 1,00,000 miles in the body. Veins are often located close to your skin)

Capillaries are the fine branching blood vessels that form a network between the arteries and veins. They are r***esponsible*** for the ***exchange of oxygen, nutrients, and waste products*** between the ***blood and the body's tissues***. They are located inside all tissues.

Q8. You have studied this chapter that due to certain abnormal conditions, the kidneys can fail. Is it possible for a person to survive with one kidney? How can such people be cured?

Answer: ***A person can survive on a single kidney. Most people live normal, healthy lives with one kidney.***

- People with one kidney must ***eat sensibly, get plenty of exercise, monitor their blood pressure*** and receive ***regular checkups***, they can expect to lead a healthy life with only one kidney.
- In general, special diets are not needed by individuals who have one healthy kidney. A person with one kidney should have ***healthy well-balanced diet***, ***reduced salt intake*** and ***aim to drink six to eight glasses of water a day***, or a minimum of two liters.

- However, if ***both kidneys are damaged*** than the person ***need to go for dialysis***. When the ***kidney failure is not treatable with dialysis***, then ***kidney transplantation surgery*** is recommended.
- Careful testing has shown that the ***transplanted kidney*** can (as in other situations resulting in a single kidney) increase its function, ***reaching a level of function that is about 70 per cent*** of that ***normally achieved by two kidneys***.