TRANSPORTATION & EXCRETION

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TRANSPORTATION & EXCRETION

Plants & animals both required food for; air & water for the maintenance & breeding of a cell. Each has to be supplied to the cell of the body in a right quantity .

The transport of material in plants is carried out by the vascular tissue.

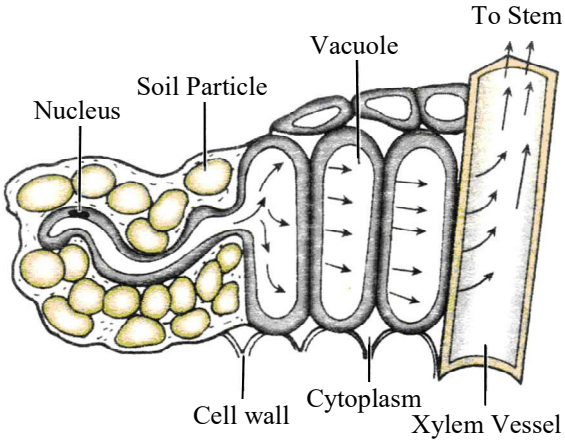
◈ **Vascular Tissue :**

There are 2 types of vascular tissues found in plants

- **Xylem :** Xylem transport water & nutrient upwards from the roots to the leave. Evaporation of water from the leaves during transpiration produces a pulling force causing water to move up
- **Phloem :** It carry the food prepared by the leaves during photosynthesis downward to all parts of the plants.

◈ **Transportation of water, minerals & food :**

- The roots have root hairs which increase the surface area of the root for absorption of water & minerals dissolved in water. The root hair come in contact with water present between soil particles.



◈ **Traspiration pulls :**

- The water move from the root hair to the xylem in the root. The absorbed water then moves up the stem through the xylem by the force developed in the leaves by the transpiration, called transpiration pull.

◈ **Ascent of sap :**

- The fluid containing water & dissolved nutrient is called sap. The movement of sap through the xylem is called ascent of sap

◈ **Translocation :**

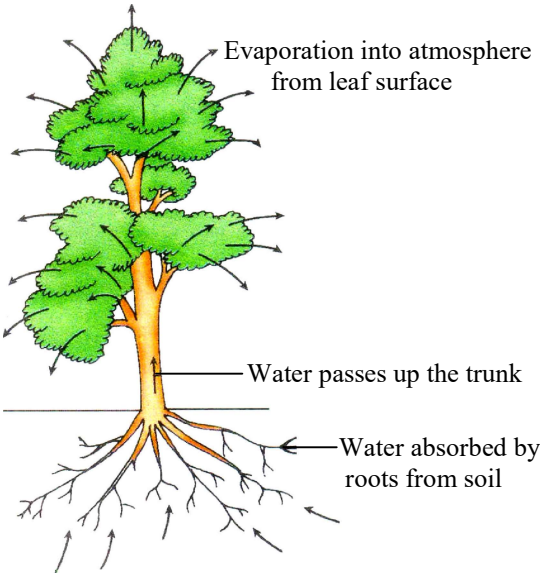
- The food is transported from the leaves to other parts of the plant, called translocation.

EXCRETION IN PLANT

- Plants have no special organs for excretion. The excess amount of CO_2 & water removed out through stomata also from the outer surface of stem, leave, fruit etc.
- Some waste products are colleced in vacuoles in the leaves & bark of trees & excrete them by shedding the leaves & barks
- Some waste products which are harmless, stored inside the plant body. Rubber raphides are examples of such products.

TRANSPIRATION

The process of loss of water in the form of vapours through the aerial parts of the plant is called transpiration.



TRANSPORTATION IN ANIMALS

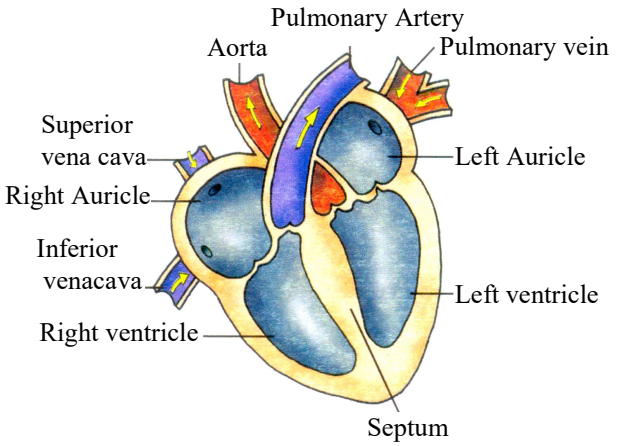
In higher animals, digested food, gases & waste material are carried by blood. Blood flows through a network of tubes, which are called blood vessles & form a system known as circulatory system

CIRCULATORY SYSTEM

It consist of heart, blood vessels & the blood.

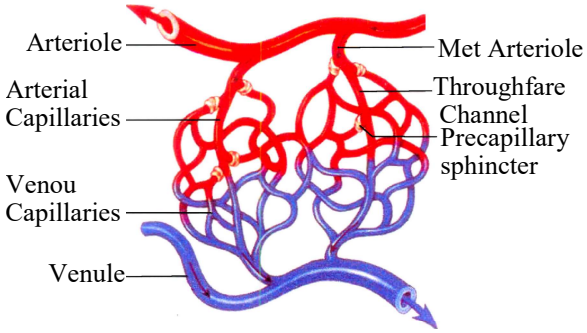
Heart :

- It is a muscular organ, which pumps blood around the blood vessels.
- It has four chambers viz left auricle, left ventricle, right auricle and right ventricle.
- Ventricles are the two lower chambers. The left ventricle receives blood from the left auricle and pumps up into aorta. Aorta is the largest artery in the body.
- The right ventricle receives blood from the right auricle and pumps it through pulmonary trunk of the lungs.
- The four chamber open and close about 100000 times a day.
- Heartbeat that we can hear is due to contraction and relaxation of heart muscles or cardiac muscles. Heart in a healthy body beats around 72 times in a minute.
- Contraction is held in auricles and relaxation is done in ventricles.
- Contraction of cardiac muscles is called **systole** and relaxation of cardiac muscle is called **diastole.**
- During diastole, heart receives blood and during systole, ventricles contract to pump blood into blood vessels.
- Sound of heartbeat is called **'Lub-dub'** sound. 'Lub' is due to contraction of ventricles and 'dub' is due to closer of auricle valves.
- The heartbeat is measured by an instrument called **'stethoscope'.** A device makes the sound of heartbeat large. Noting of pulse rate is noting the number of times heart beats in a minute.



◈ Blood vessels :

- These are blood-filled tubes.
- Arteries, veins and capillaries called blood vessels.



Arteries :

- Arteries are thick walled blood vessels, making up the arterial system and carrying blood away from the heart.
- Smaller arteries are called **arterioles**.
- Arterioles are branched off from arteries.
- Except in the pulmonary arteries, the blood contains oxygen.
- In all arteries, blood carries dissolved food and waste, brought into the heart by veins and is then transferred to arteries.
- Arteries carry the food to the cells and waste to the kidneys.

Veins :

- Veins are wide, thick walled, blood vessels.
- Veins make the venous system and carries blood back to the heart.
- Small veins are called venules.
- Veins contain valves to stop blood flowing backwards due to gravity and are formed of merging venules
- The blood in the veins leading from the digestive system and liver also carries dissolved food. This is transferred to the arteries in the heart

Capillaries :

- Narrow, thin walled blood vessels branching off arterioles to form a complex network is called **capillaries**.
- Dissolved food and oxygen pass out through the walls of capillaries to the body cells and carbon dioxide and waste pass in
- The capillaries of the digestive organs and liver also pick up food
- Finally, capillaries join up to form small veins called venules

◈ Blood :

- It is a connective tissue in fluid form
- An adult human has around 5.5 litres of blood
- A red fluid flows in the body
- It supplies food and oxygen to every body cell
- It removes wastes from the cells
- It regulates body temperature
- It protects against infection

CONSTITUENT OF BLOOD

◈ RBC (Red Blood Corpuscles) :

- This is also called erythrocytes.
- RBC is a red disc shaped cells with no nuclei.
- They are made in the bone marrow and contain haemoglobin (an iron compound that gives blood a dark red colour).
- RBC combines with oxygen to form oxy-haemoglobin and the blood becomes bright red.
- The red cells pass the oxygen to the body cells by the process of diffusion and then returns to the - lungs with haemoglobin.

◈ WBC (White Blood Corpuscles) :

- This is also called leucocytes.
- WBC is large, opaque blood cells, which helps in body defence.
- WBC makes antibodies. Antibodies produce antigens, which combat against any bacterial or viral infection. Antigens are mostly protein.

◈ Plasma :

- It is a pale liquid with 90% water in it.
- Plasma contains the blood cells.
- Plasma carries dissolved food for the body cells, waste matter, and carbon dioxide secreted by them.

◈ Platelets :

- It is also called thrombocytes.
- It is a very small, disc shaped bodies with no nuclei.
- It is made in the bone marrow.
- They gather particularly in an injured area, where they are important in clotting the blood.

REMOVAL OF WASTE

The process of removing waste from the body is called excretion

Several organs of body is involved in the process of excretion –

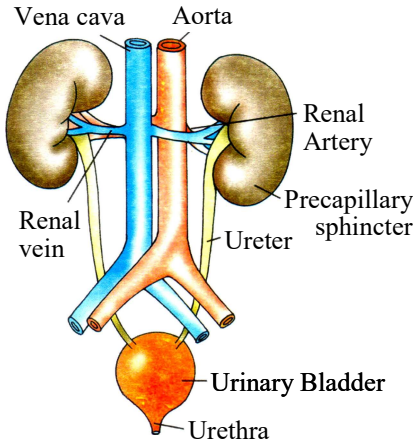
- The waste generated in the process of digestion is expelled from the large intestine through anus.
- Carbon dioxide produced in the process of respiration is expelled from the lungs through the nostrils.

EXCRETION IN HUMANS

Chemical waste like urea are excreted by urinary system & skin.The excretory system in human beings consists of the following organs:

- A pair of kidneys
- A pair of ureters
- The urinary bladder
- Urethra

◈ Urinary system or Excretory system :



- **Kidneys :**

  In our body there is a pair of kidneys located in the abdomen, one each on either side of the vertebral column. Each kidney is brick red in colour and bean-shaped. It weighs about 150 g and is about 12 cm in length, 6 cm in width and 3 cm in thickness

- **Uterers :**

  The ureters are two thin-walled, urine carrying ducts. A ureter originates from each kidney and is about 30 cm in length. The ureters run downward and open into the urinary bladder

- **Urinary Bladder :**

  It is a bag-like structure in which urine is stored. Its size and position varies with the amount of urine it contains.

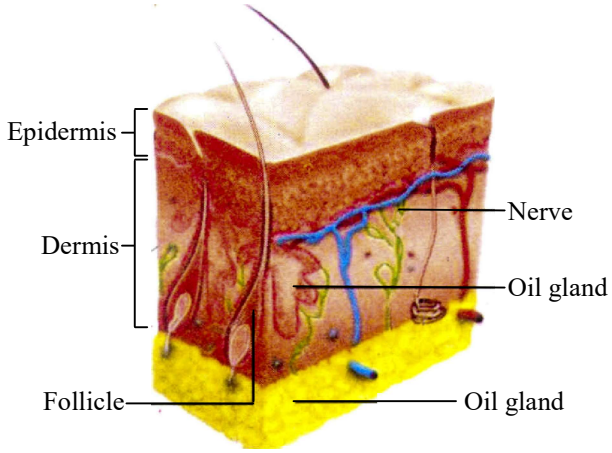
- **Urethra :**

  The urethra is the duct which finally discharges urine from the body

◈ **Function of Kidney**

- They filter wastes from the blood
- They help in the formation of urine
- They help in eliminating harmful substances from the body
- They maintain the water and mineral balance in the body

◈ **Skin :**



- Skin is the outer body covering of human body. It is made up of several tissue layers cushioned by fats underneath.
- Skin has many functions. Skin provides stimulation, protects against infection, prevents from drying out, regulates body temperature, stores fat, makes vitamin D, and above all excretes waste such as sweat

EXERCISE # 1

A. Single Choice Type Questions

Q.1 The process by which a plant loses water through the stomata is called -
(1) Excretion (2) Transpiration
(3) Respiration (4) Sweating

Q.2 Urea is a waste produced in the process of the breaking down of -
(1) Protein (2) Fats
(3) Carbohydrate (4) Sugar

Q.3 Digested food, gases, waste & other substances pass into & out of the blood through the thin walls of -
(1) Nephrons (2) Veins
(3) Capillaries (4) Arteries

Q.4 The smallest functional unit of kidney is -
(1) Nephron (2) Capillary
(3) Urethra (4) Ureter

Q.5 Which component of blood helps in clotting ?
(1) RBC (2) WBC
(3) Platelets (4) Plasma

Q.6 The opening of urinary bladder is known as -
(1) Nephron (2) Urethra
(3) Ureter (4) Nephridia

Q.7 The cause of wilting of plant is -
(1) More absorption
(2) More transpiration
(3) Low respiration
(4) None

Q.8 Blood from the lungs enter the heart through the -
(1) Pulmonary artery (2) Arota
(3) Pulmonary vein (4) Venacava

Q.9 Pumping station of blood is -
(1) Heart (2) Auricle
(3) Blood vessel (4) Ventricle

Q.10 Bean shaped excretory organ of human is -
(1) Kidney (2) Urethra
(3) Ureter (4) Urinary bladder

Q.11 It transport the water & minerals from root to leaves in plants -
(1) Xylem (2) Cambium
(3) Phloem (4) Stomata

Q.12 In plants excess amount of carbon dioxide ascaps through the -
(1) Stomata (2) Phloem
(3) Xylem (4) Cambium

B. Fill In The Blanks

Q.13 Arteries carry oxygenated blood & vein carry …… blood.

Q.14 Sweat contain waste, salt & …… .

Q.15 Kidney is made up of tiny structure called ……

Q.16 The liquid part of the blood is called ……

Q.17 The liquid which leaves the kidney is called ……

EXERCISE # 2

A. Very Short Answer Types Questions

Q.1 Name the two tissues of plants which transport materials

Q.2 What are the main constituents of urine?

Q.3 What are the lower chambers of the heart called?

Q.4 Where are nephrons found in human body?

Q.5 Which gaseous products are excreted by plants?

Q.6 Name the liquid part of the blood.

Q.7 Where is the dirty blood of our body filtered?

Q.8 In plants which part performs transpiration

Q.9 Which muscular organ pumps blood around the blood vessels?

Q.10 What are the two lower chambers of heart?

Q.11 Which ventricle receives blood from left auricle?

B. Short Answer Types Questions

Q.12 What will happen if there are no platelets in the blood?

Q.13 Why is blood needed by all parts of the body?

Q.14 How is water transported in plants?

Q.15 What role do blood banks play in human health?

Q.16 List the human excretory organs.

Q.17 State two vital functions of kidney

Q.18 Why is transpiration important for plants?

Q.19 What is blood?

C. Long Answer Types Questions

Q.20 State four functions of blood.

Q.21 With the help of a diagram, explain the human excretory system.

Q.22 State four differences between arteries and veins

Q.23 What are capillaries? Why do they have thin walls?

Q.24 What are advantages and disadvantages of transpiration in plants?

Q.25 Describe the transportation process of water, minerals and food in plants with the help of a diagram

Q.26 Explain the mechanism of excretion in humans.

Q.27 Write the components of blood. What are the functions of blood?

Q.28 Distinguish between

a. Xylem and Phloem
b. Excretion and transpiration
c. Circulatory and vascular system
d. Blood and Plasma

Q.29 Mention and three characteristics of the following

a. RBC b. WBC
c. Plasma d. Platelets