GRAVITY CLASSES

"Come Gravity Feel Success"

11th & 12th BOARD
(NEET & JEE)

5th - 10th (All Subject)

NOTES

BIOLOGY

Directors
ER. AMIR SIR
ER. ASAD SIR

7004166363
7717752909

Address:
Blue star campus,
patther ki masjid, patna - 6

LIFE PROCESSES

➢ **Life Process:-** The process which maintain body functions and necessary for survival are called L.P.

OR

- All the processes which together keep the living organisms alive and perform task to maintain the body are called life process.

  Example:- Nutrition, Respiration, Transportation, Excertion.
- **Nutrition:-** The process of taking nutrients from food is called Nutrition.

  Ex. Carbohydrates, fats, protiens, water, vitamins and minerals etc.

➢ **Modes of Nutrtition**

- **Autotrophic Nutrition:-** It is a process in which organism produces their food from simple inorganic material (Water, CO_2) in the presence of sunlight.

  Ex. Plants.
- **Hetrotrophic Nutrition:-** In this organisms depend upon other organisms for food to survive.

  Ex. Human Beings, Amoeba etc.

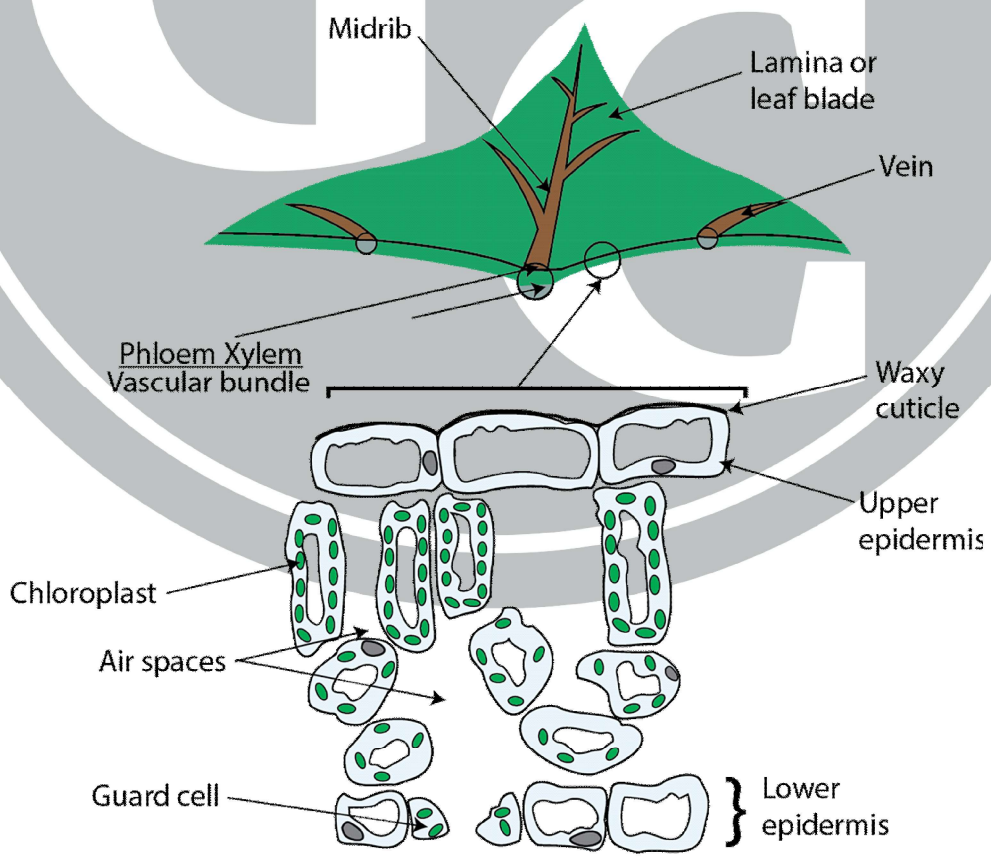
➢ **Nutrition in Plants**

- **Photosynthesis:-** The process in which green plants convert simple inorganic materials (H_2O, CO_2) into complex organic food material ($C_6H_{12}O_6$) in the presence of chlorophyll and sunlight.

$$CO_2 + H_2O \xrightarrow[\text{Chlorophyll}]{\text{Sunlight}} C_6H_{12}O_6(\text{Glucose}) + O_2 + ATP$$

Event occur during photosynthesis:-

- Absorption of lilght energy by chlorophyll.
- Conversion light energy to chemical energy and splitting of water molecules into 'H' and 'O'.
- Reduction of carbon dioxide to carbonhydrates.
- **Chloroplasts:-** These are the small organelles found in plant cell. It contain chlorophyll which absorb sunlights for photosynthesis.



Heterotrophic Nutrition

Saprophytes Nutrition	Parasitic Nutrition	Holozoic Nutrition
The mode of nutrition in which organism obtain food from dead and decaying organic matter. Ex. Mushroom, Bacteria, Fungi	The mode of nutrition in which organism obtain food from another organism without killing them. Ex. Plasmodium (cause malaria), Mosquito, Tapeworm.	The mode of nutrition that involves ingestion, digestion, absorption and assimilation of liquid or solid organic material. Ex. Animal, Human

➢ **Nutrition of Human:-**

- **Mouth:-** Intake
- **Teeth:-** break the food
- **Tongue:-** Tasting & Rolling the food
- **Salivary Glands:-** Produce saliva, Saliva contains enzyme salivary amylase that breakdown starch (food) to simple sugar.
  Starch (food) + Salivary Amylase → Sugar (Glucose)
- **Oesophagus:-** Taking food from mouth to stomach by peristaltic movements.
- **Stomach:-** Stomach is large organ it expands when food enters in it.
- **Gastric Gland:-** It release Gastric Juice. Gastric Juice contains → HCL, Pepsin & Mucus.
  HCL:- Make medium acidic, kill harmful bacteria of food.
  Pepsin:- Breakdown the Proteins into Amino Acid.
  Mucus:- Protect inner lining of stomach.

➢ **Small Intestine:-** It is the site of complete digestion.

- **Liver:-** It produce Bile Juice (Greenish) and Bile Salt (Yellowish).
  Bile Juice: It makes the food Alkaline.
  Bile Salt: Break the large fat glabules. This is called emulsification.
  Make acidic food coming from stomach alkaline, so that pancreatic enzymes can act on it.
- **Gall Bladder:-** It store Bile Juice and Salt.
- **Pancreas:-** Tripism, Lipase.
  Tripism: Breakdown protein into Amino Acid (work only basic medium).
  Lipase: it breaks down emulsified fat
  Fat: Fatty acid and Glycerol.
  Starch: Sugar (Glucose).
  Protien: Amino Acid.
- **Villi:-** Finger like structure/projection and inside small intestine. These increase the surface area of absorption.
  Villi are supplied the food to blood vessels. Then the blood vessels take the food to each and every cell of the body.
- **Large intestine:-** The unabsorbed food sent to large intestine where its walls absorb more water from this material and rest of the material removed from the body via Anus.

RESPIRATION

The process in which the cells of an organism obtain energy by combining oxygen and glucose is called Respiration. It envolves breathing.

There are two types of respiration

i. **Aerobic Respiration:** it is the process of producing energy in the presence of oxygen.
ii. **Anaerobic Respiration:** It is the process of producing energy in the absence or lack of oxygen.

Glucose ($C_6H_{12}O_6$) in Cytoplasm

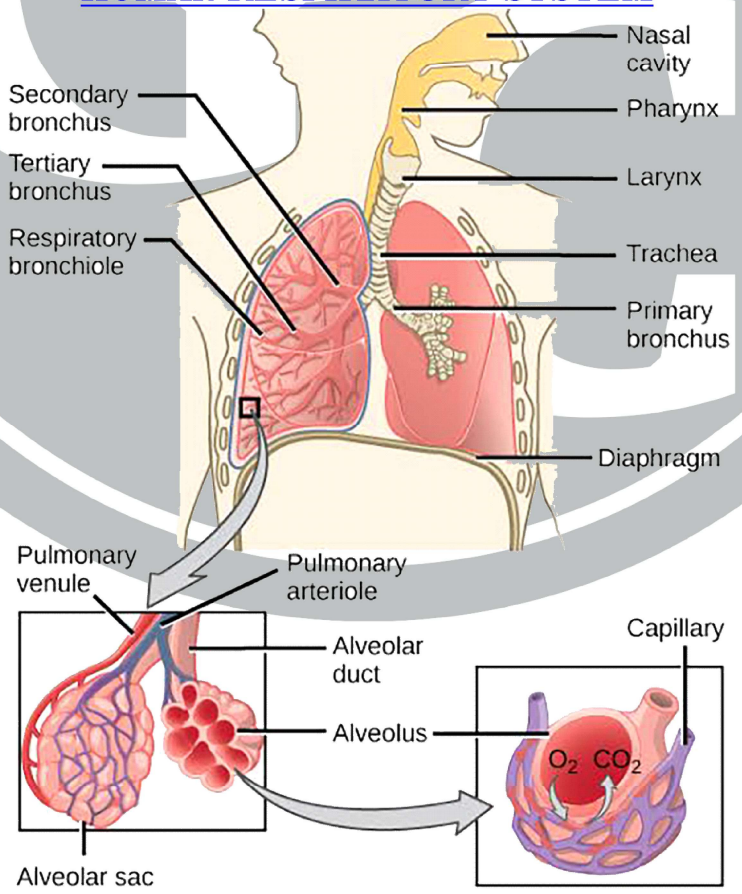
↓

Pyruvate ($C_3H_4O_3$) + Energy

Absat of O_2	Lack of O_2	Presence of O_2
↓	↓	↓
Ethanol (C_2H_5OH) + Carbon dioxide (CO_2) + Energy (2 ATP)	Lactic Acid ($C_3H_6O_3$) + Energy (2 ATP)	Water + Carbondioxide + Energy (38 ATP)

Process take place in Yeast (Single cell organism)	Process take place in Muscles cells	
➢ It is used to make bread or cake ➢ CO_2 makes fluffy.	When lack of O_2 to muscles then pyruvate + lack of O_2 generated Lactic Acid (Pain+Cramp)	This process happened in cell of mitochondria organelles.
➢ Cake is so fluffy because of Yeast ➢ Ethanol → Bad Smell.	➢ Hard work, Running ➢ Crystalline form of Lactic Acid.	The energy released during cellular respiration is used to synthesize molecule called ATP (Adenosine Triphosphate)
When Yeast is fermented (cooked) it releases CO_2	Lactic Acid is responsible for pain/cram in muscles.	Energy currency of life. ATP

HUMAN RESPIRATORY SYSTEM



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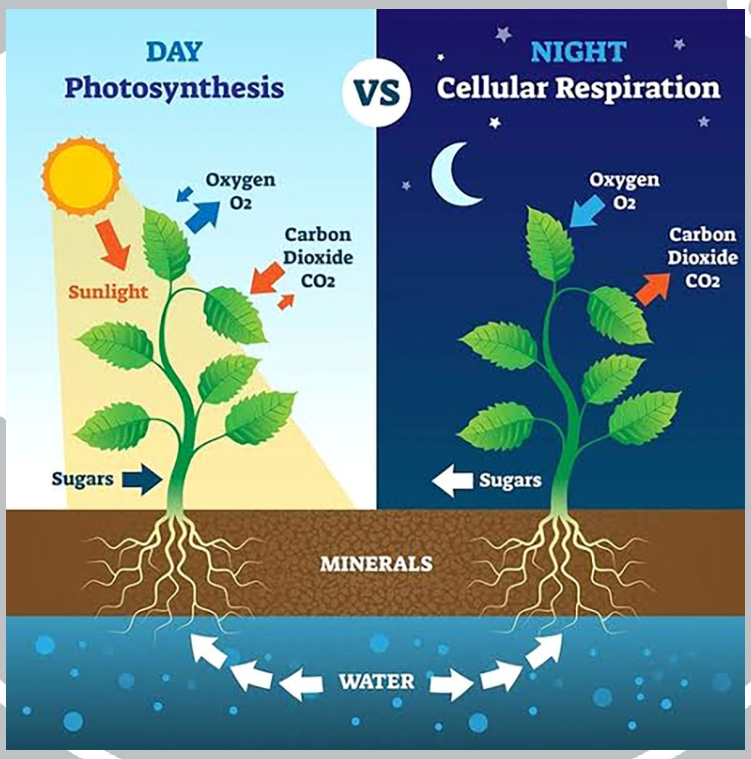
- Oxygen riched air is taken into the body through the nose. The air is filtered by tiny hairs present in nose. From nose the air passes through the throat to lungs.
- **In Lungs:-** The air passage divides into smaller and smaller tubes and finally reach in alveoli.
- **Alveoli:-** It is a balloon like structure which provide a surface for exchange of gases. the walls of the alveoli connect with blood vessels.
- Then oxygen dissolve in Hemoglobin from alveoli and carried from lungs to cells in all body parts.
- The blood bring carbon dioxide from the cells release into Alveoli.
- Hemoglobin (RBC) is responsible for the carry O_2 and absorb then delivered to the cell of the body parts.
- Rib → 12 Pain (Thoracic Region).
  7 - True Rib (Connected to Backbone).
  3 - False Rib (Connected with T.R sternum).
  2 - Floating Rib (Connected only Backbone).

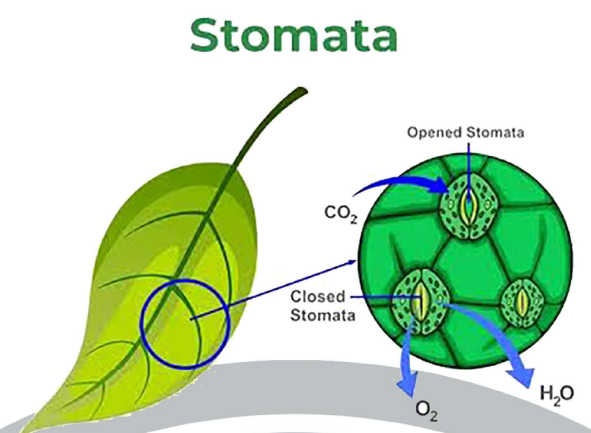
RESPIRATION IN PLANTS

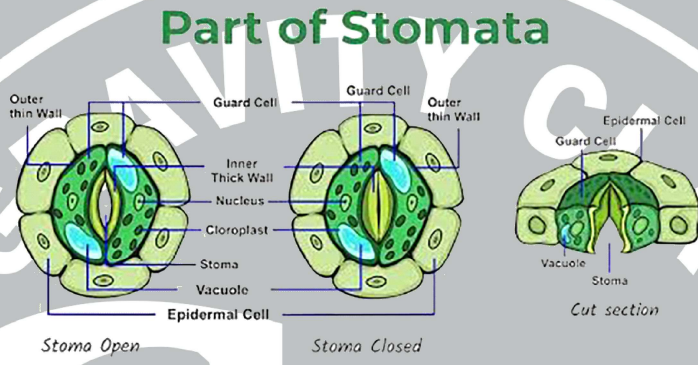
Gaseous Exchange occur in plants through:-

- **Stomata in leaves:-** Tiny pores of leafs.
- **Lenticels in stem:-** Some gases are exchange from stem as well.
- **Surface of Roots/Hairs:-** Exchange of gases also take place from root and from soil particles to root hair by the process of Diffusion. After use of O_2, CO_2 is Diffused into the soil.



Day	Night
$H_2O \rightarrow H_2 + O_2 \uparrow$	During day → CO_2 generated during respiration → Photosynthesis O_2 Release.
$CO_2 + H_2O \rightarrow C_6H_{12}O_6$ further. $C_6H_{12}O_6 + O_2 \rightarrow CO_2 + H_2$ $CO_2 \rightarrow$ Store	At Night → No Photosynthesis





- During respiration plants absorb oxygen and use them with glucose to create carbon dioxide, water and energy.
- This energy is helpful for the plant to grow and to survive.

$$\boxed{\text{Glucose}(C_6H_{12}O_6) + O_2 \longrightarrow CO_2 + H_2O + \text{Energy}(38ATP)} \rightarrow \text{Respiration}$$

$$\boxed{CO_2 + H_2O \longrightarrow C_6H_{12}O_6 + O_2} \rightarrow \text{Reverse to photosynthesis}$$

TRANSPORTATION IN HUMAN

- Blood is a connective tissue in humans. It transport necessary substances to cells and transport metabolic waste product away from those same cells.

The main component of blood:

i. **Plasma:-** It is a yellow colour fluid. It transport food, CO_2, waste product etc.

- It contain solube protein, food maerial, waste product, dissolved gas [CO_2 from lungs], inorganic salt.
- $\boxed{\text{Serum} = \text{Plasma} - \text{Clotting Protein}}$

ii. **Red Blood Cells (RBC)/Erythrocytes:-** It contain Hemoglobin which transport oxygen.

- Hemoglobin is responsible for blood of RED colour.
- No cell organelles.
- No nucleus present.
- No cell division.
- Life span - 120 days.
- Area of formation Bone marrow.
- Dead of RBC in spleen.
- Some formation of RBC also in spleen.
- Spleen is called graveyard of RBC.
- Spleen is also called Blood Bank.
- Haemoglobin → Pigment - Pink.
- 1 Hb → 4 Oxygen bind.
- Biconcave shape.

iii. Platelets:- These help in blood clotting.

iv. White Blood Cells (WBC)/Leukocytes:- These cells fight against harmful bacteria, viruses and germs.

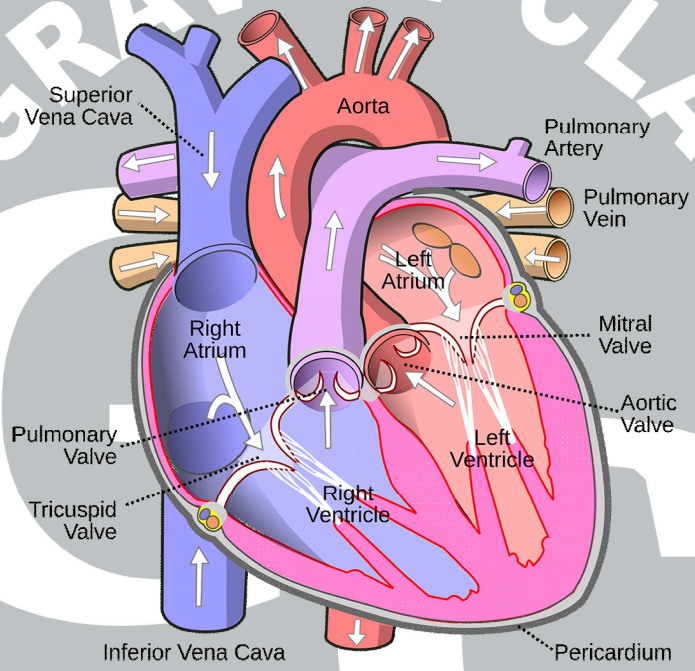
- It also increases the immune system.
- No fixed shape (to reach wound).
- It is colourless.
- Life span from few hours to 13/14 days.
- It eat dead cell.
- When WBC it self died the another WBC eat to them.

Note:- The heart pumps the blood through the blood vessels.

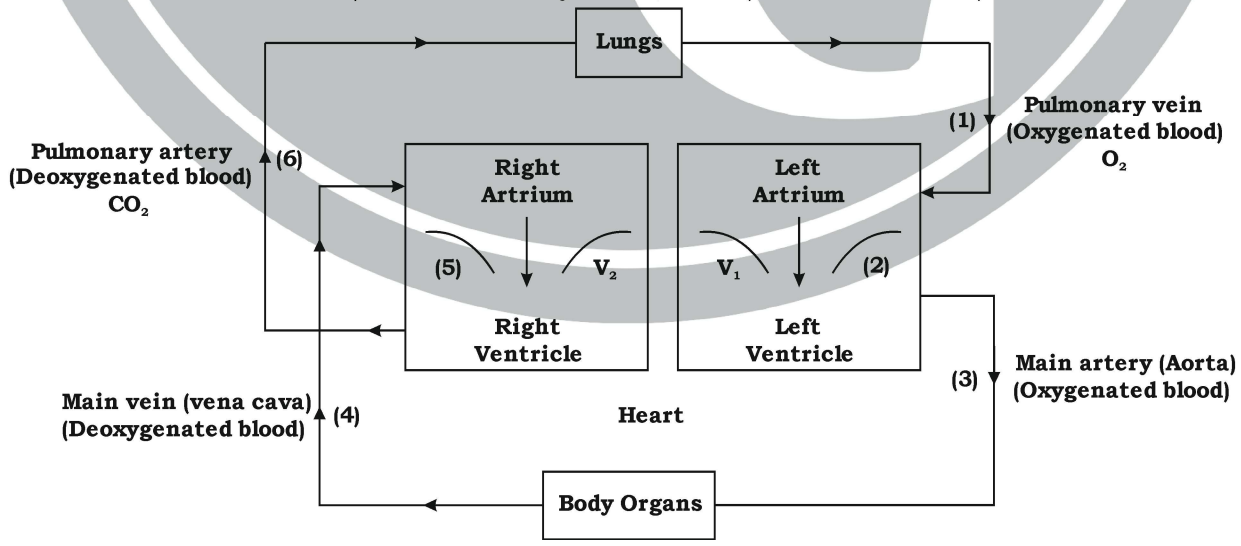
- **Heart:-** Heart is a muscular organ. It have two sides separated by muscular wall. It have four chambers Left Atrium, Right Atrium, Left Ventricle and Right Ventricle.

Q. How heart Works?

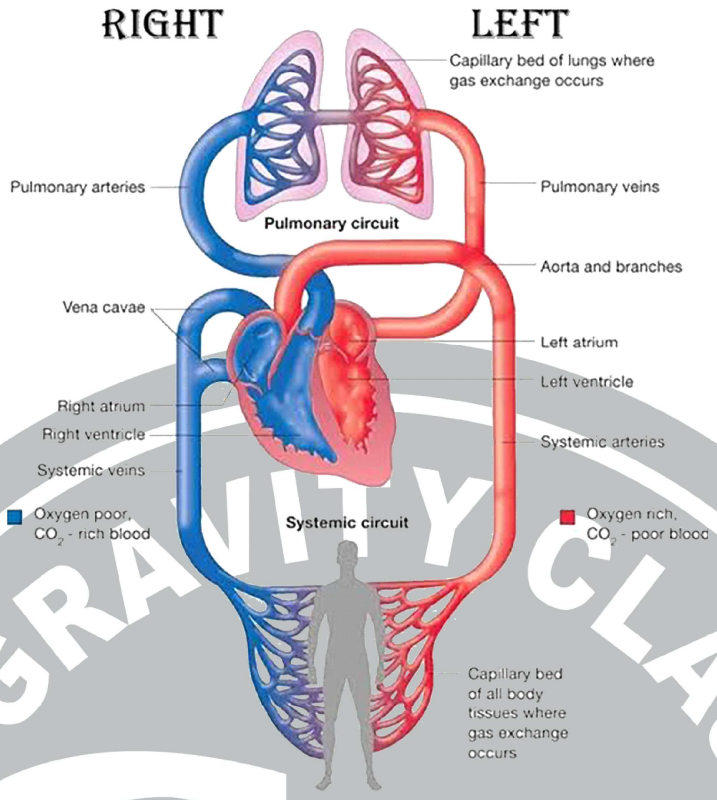
- Deoxygenated blood comes from body to Right Atrium which them pumped to your lungs by Right Ventricle through pulmonary Arteries, where it drop carbon dioxide and carry oxygen. Then oxygenated blood comes to left Atrium through veins, which then pumped to body parts by Left Ventricles through Aorta.



- Pacemaker joined to SA Node (Sinoatrial)
- If heart rate less than 60/min then Bradycardia, BPM (Beats Per Minute).

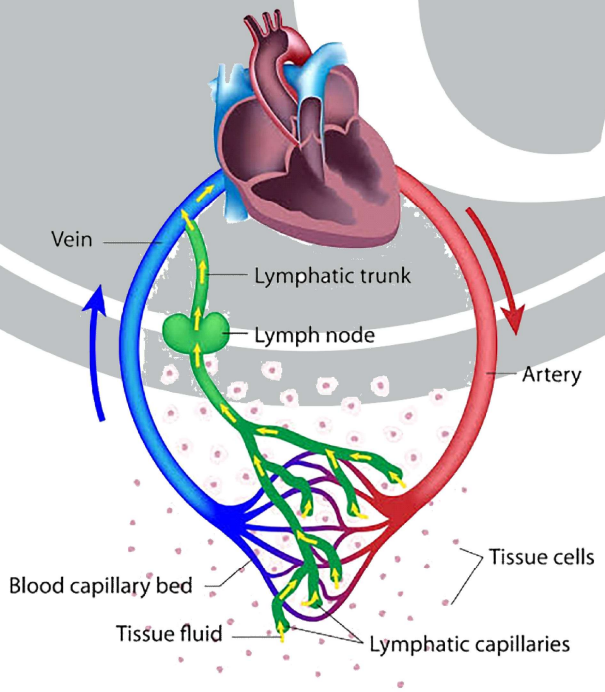


Working of Human Heart

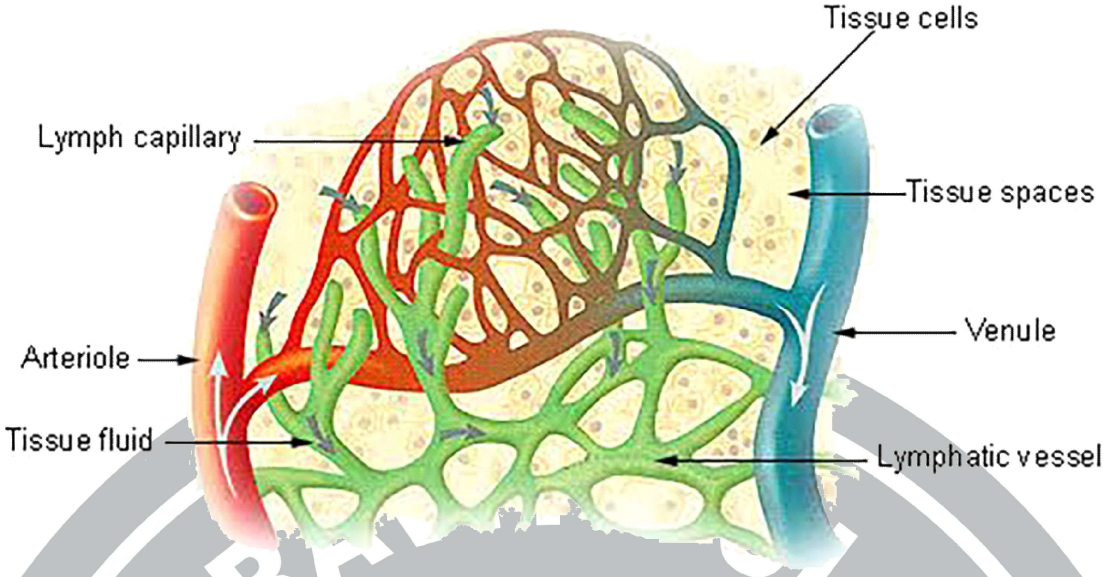


➢ **Blood Vessel**

- **Arteries:-** These carry oxygenated blood from heart to parts except pulmonary artery. These are thick and elastic. The smallest vessels which are one cell thick walls are called capillaries.
- **Veins:-** Veins carry deoxygenated blood from body parts to heart except pulmonary vein. These are thin and less elastic.
- **Lymph:-** This is also a transporter fluid. The pores present in the walls of capillaries some amount of plasma, proteins and blood cells escape into intercellular space in the tissue to form the lymph.
- It is colourless.
- Lymph absorbs and transports fat from intestine.
- It drain away the excess tissue metabolism (waste product from tissue).



Lymph Capillaries in the Tissue Spaces



➢ **Transporation in Plants:-** There are two transporter tissue in plants.

XYLEM	PHLOEM
It transports water and minerals in upward direction from roots to highest point of the plant.	It transports food from leaves to other parts of the plant.
It only transports upwards.	It can transport upward as well as downward.
It works on the principle of Transpiration.	Transport of food from leaves to other parts of plant is called Translocation.

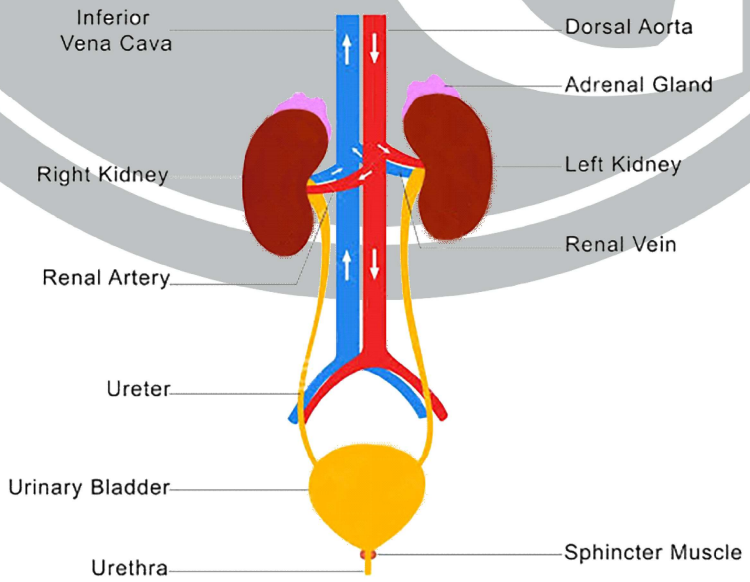
- **Transpiration:-** It is the process of loss of water as vapour from aerial (upper part) parts of the plant with the help of stomata of leaf.

EXCREATION

The metabolic (Digestion, Energy) activities in the body generates many kinds of wastes. It is a process in which wastes are removed fro our body.

- **Metabolic Wastes:-**

i. Digestive Waste.
ii, Respiratory Waste.
iii. Nitrogenous Waste → Urea, Uric Acid, Water (These dissolve in our blood).



➢ **Human Excretory System**

It consists of two Kidneys,Ureters, Urinary, Bladder and Urethra.

- **Kidney:-** It filters the blood and remove wastes.
- **Ureters:-** It drain out urine from kidney to urinary bladder.
- **Urinary Bladders:-** It stores the urine.
- **Urethra:-** Transmit urine outside the body.

Note:- Kidney have filteration unit called Nephrons.

➢ **Nephrons:-** Nephrons are filtration units of kidney. It consists of a tube which is connected to duct and a cup shaped structure that is Bowman's Capsule.

- **Bowman's Capsule:-** It filters blood and collect urine.
- **Henle's Loop:-** Reabsorption of glucose, amino acid, water, urine and uric acid. Then urine enters into ureter through ducts and collected in urinary bladder.

➢ **Exception in Plants**

- Plant remove oxygen through stomata.
- Excess water removed through stomata by transpiration process.
- Plants also loose some old leaves and barks.