

## LIFE PROCESSES

All the vital processes which are required by an organism to survive are called life processes.

Nutrition, photosynthesis, transportation, metabolism, respiration, reproduction, and excretion are important life processes.

### IMPORTANT LIFE PROCESSES

NUTRITION

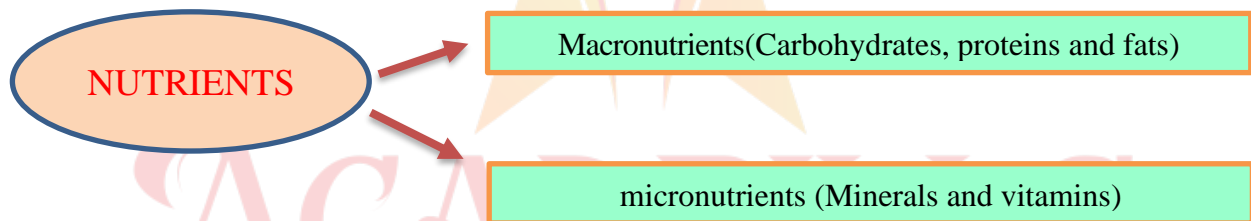
TRANSPORTATION

EXCRETION

### NUTRITION

The process, by which an organism takes food and utilizes it, is called nutrition.

Nutrition is essential for the growth and development of organisms. It also provides energy to do different work.



### HOW DO LIVING THINGS GET THEIR FOOD?

#### Autotrophic Nutrition

Perform photosynthesis.

#### Heterotrophic Nutrition

Can not perform photosynthesis.

### AUTOTROPHIC NUTRITION

The mode of nutrition in which an organism prepares its own food is called autotrophic nutrition. Green plants and blue-green algae make their food by a process called photosynthesis.

### PHOTOSYNTHESIS

- The process by which plants in the presence of pigment, sunlight, water, and carbon dioxide form food and release oxygen is known as photosynthesis.
- The overall reaction occurring in photosynthesis is as follows:



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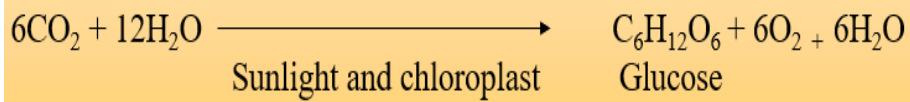
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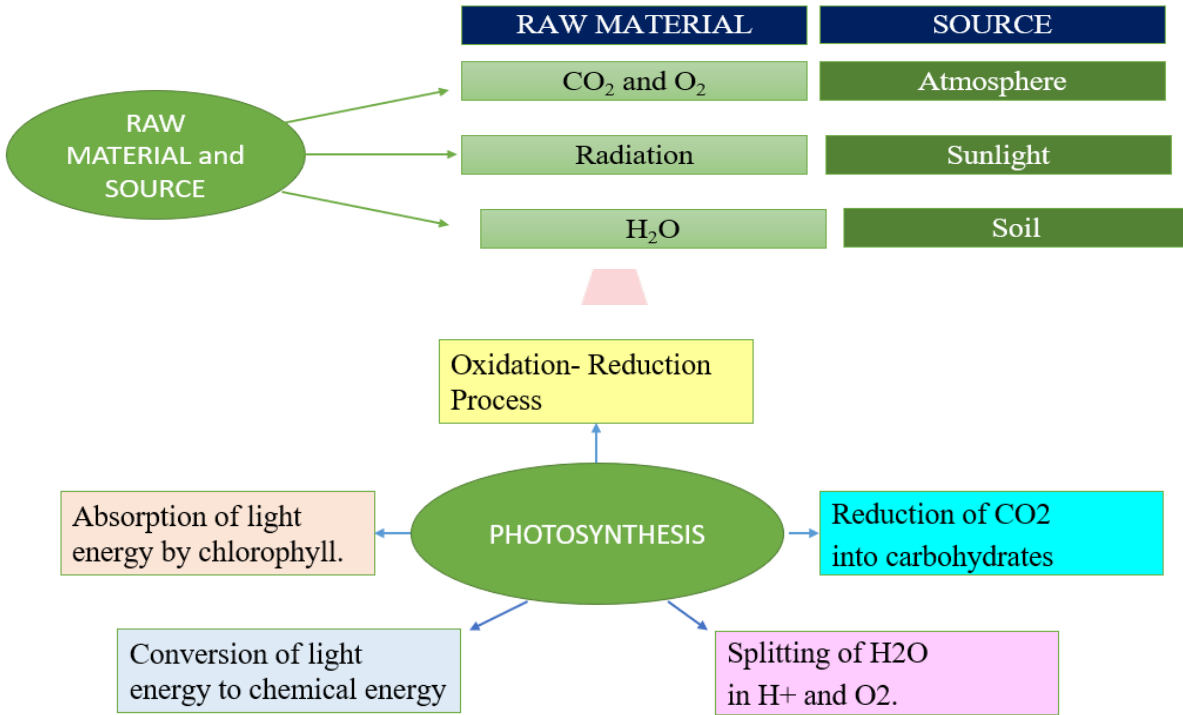
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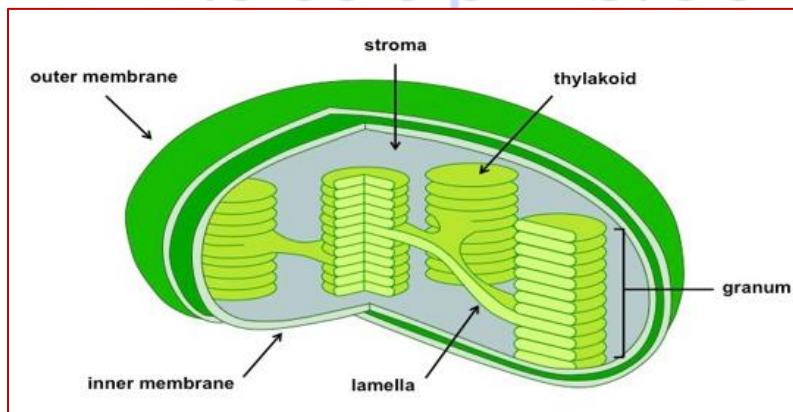


## PHOTOSYNTHESIS – Raw Material and Events



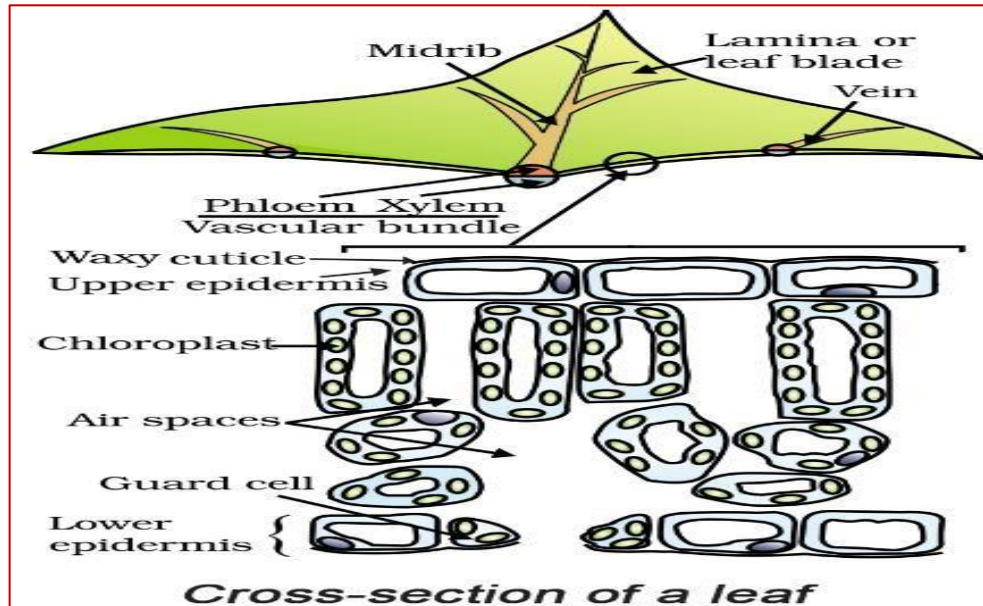
## Chloroplast

It contains the main photosynthetic pigment chlorophyll and accessory pigments xanthophyll and carotenoids.



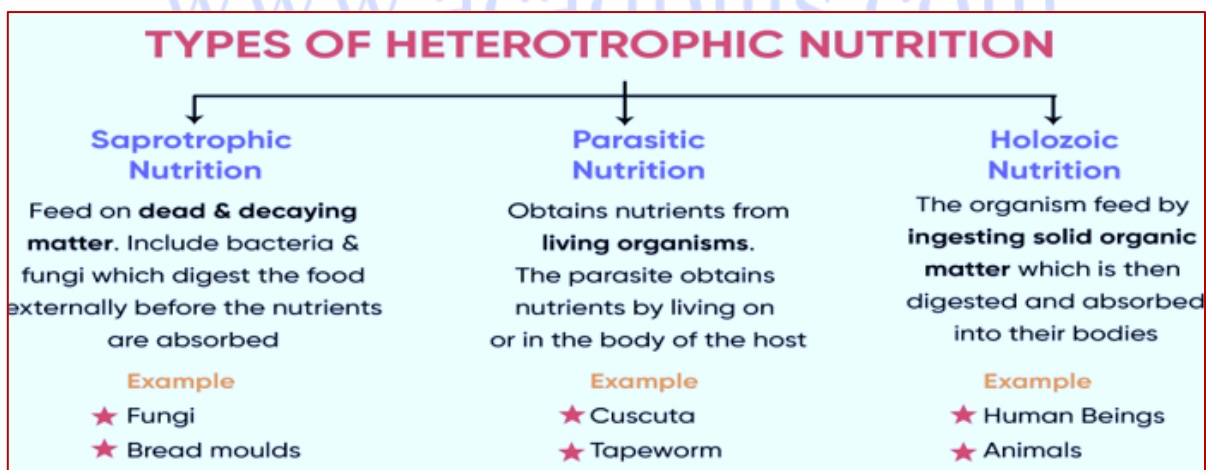
## Stomata

Gaseous exchange and transpiration (loss of water as water vapors) take place through minute aperture on the surface of leaves called stomata. Stomata has a pore (stomata pore) guarded by bean shape guard cells (regulate the opening and closing of stomata).

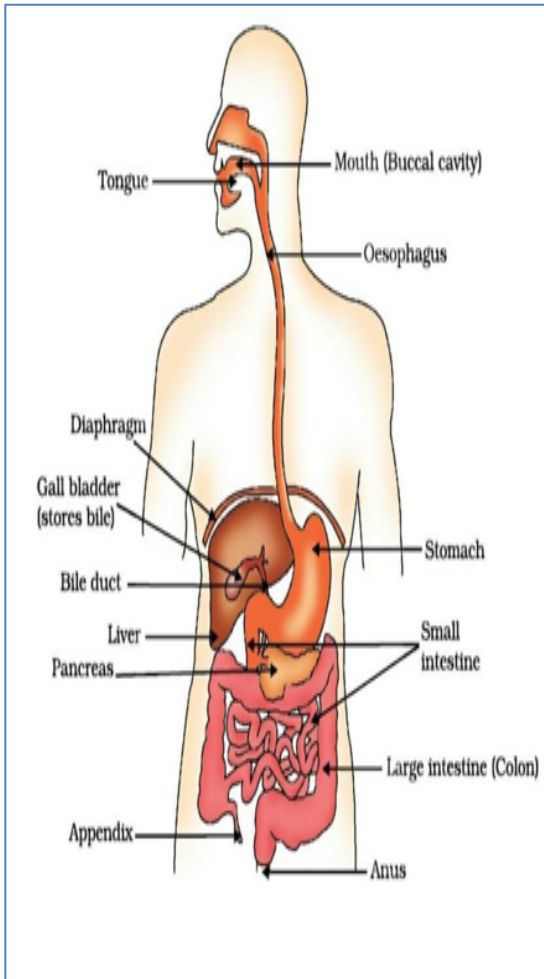


## HETEROTROPHIC NUTRITION

In this type of nutrition, organisms obtain their nutrient from other living organisms (parasites) e.g. Animals or dead and decaying objects (saprophytes e.g. Fungi like bread molds, yeast and mushrooms).

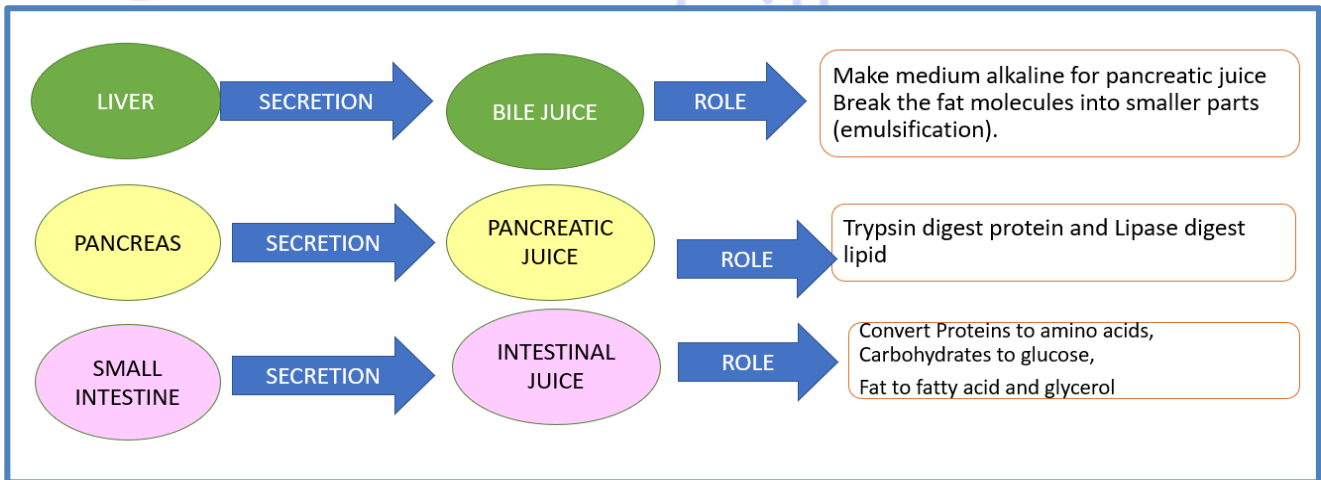


# HUMAN DIGESTIVE SYSTEM



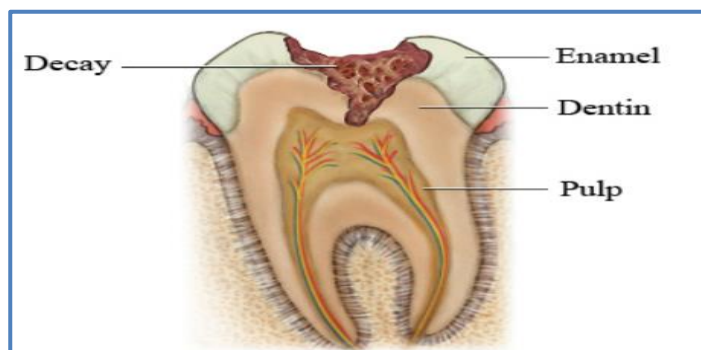
- Food is crushed and mixed with saliva with the help of teeth and tongue.
- Saliva contains salivary amylase that breaks down starch.
- By peristaltic movement in the oesophagus the food enters the stomach.
- In the stomach food is mixed with HCL, Protein digesting enzyme pepsin, and Mucus.
- HCL kills the germs in food as well as provides an acidic medium essential for pepsin.
- Mucus protects the inner lining of the alimentary canal by HCL.
- Small intestine receives secretions from the liver and pancreas through a common duct.
- Unabsorbed food enters the large intestine for further absorption of water.
- Undigested food is removed from the body via anus.

## DIGESTIVE SYSTEM ORGANS AND THEIR ROLES-



## DENTAL CARIES (TOOTH DECAY)

It is caused due to acid produced by bacteria. In this enamel softens and may cause dental plaque and cavities.



## RESPIRATION

### Keywords

<b>Cytoplasm</b>	<b>Fluid part within the cell</b>
<b>Mitochondria</b>	<b>Site of energy production (the powerhouse of the cell)</b>
<b>Pyruvate</b>	<b>The intermediate product of respiration</b>
<b>Ethanol</b>	<b>A type of alcohol (C<sub>2</sub>H<sub>5</sub>OH)</b>
<b>ATP</b>	<b>Adenosine triphosphate, an energy-rich compound</b>

The process of Breaking complex organic material into a simpler form with the help of enzymes is called respiration.

### Types of respiration and site

Type	Definition	Site
<b>Aerobic respiration</b>	<b>It occurs in the presence of oxygen</b>	<b>Cytoplasm and Mitochondria</b>
<b>Anaerobic respiration</b>	<b>It occurs in the absence of oxygen.</b>	<b>Cytoplasm</b>
<b>Fermentation</b>	<b>It is a type of anaerobic respiration occurs in a few microorganisms</b>	<b>Cytoplasm</b>

## PROCESS OF RESPIRATION

- Glucose is broken down into pyruvate in the cytoplasm of a the cell.
- In the presence of oxygen, pyruvate enters into mitochondria and completely oxidized there to produce C<sub>2</sub> and energy (ATP).
- In the absence of oxygen pyruvate partially decompose and form. Eg- Ethanol in yeast (fermentation), b- Lactic acid in muscle cells

## HUMAN RESPIRATORY SYSTEM

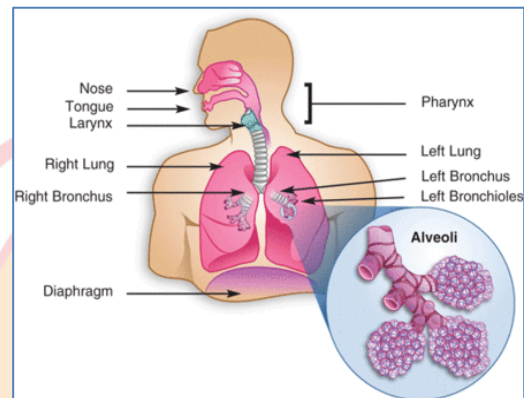
(consists of the nostril, nasal passage, pharynx, larynx, trachea, bronchi, bronchioles, alveoli, diaphragm, and ribcage.)

The inhale of oxygen and exhale of CO<sub>2</sub> is known as breathing. Air is taken into body through nostrils

From nostril air passes through the pharynx, larynx, trachea, bronchi, bronchioles and finally alveoli.

At alveoli exchange of oxygen and CO<sub>2</sub> takes place with blood vessels by process of diffusion.

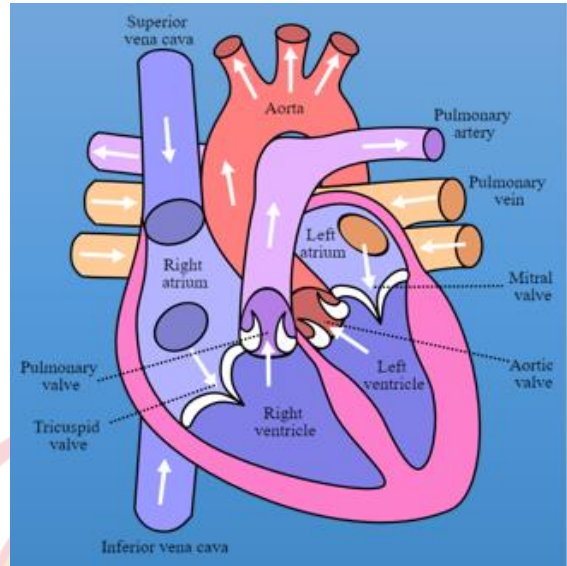
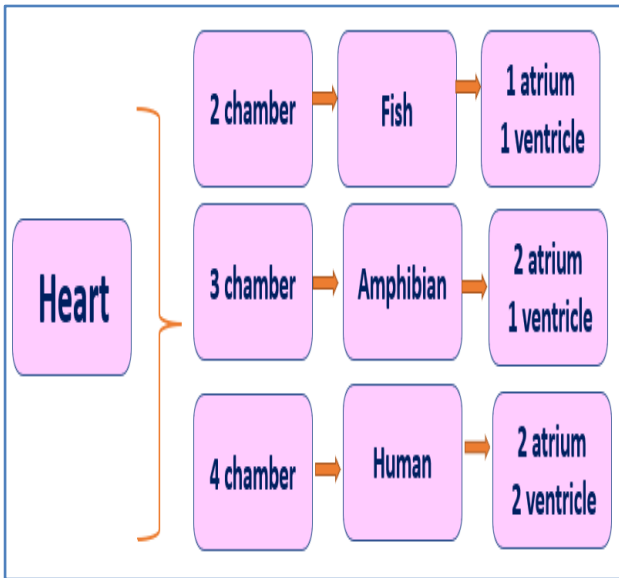
Oxygen enters into blood vessels while CO<sub>2</sub> enters into the alveolar sac. Both oxygen and CO<sub>2</sub> is carried by iron-containing hemoglobin.



## TRANSPORTATION IN HUMAN BEINGS

<b>Blood</b>	<b>Connective tissue consists of RBC, WBC, Platelets and plasma.</b>
<b>Plasma</b>	<b>The fluid portion of the blood</b>
<b>Systole</b>	<b>Contraction of heart chambers</b>
<b>Diastole</b>	<b>Relaxation of heart chambers</b>
<b>Double circulation</b>	<b>Blood goes through the heart twice</b>
<b>Arteries</b>	<b>Thick-walled. elastic, Carry blood away from heart to various organs</b>
<b>Veins</b>	<b>Thin-walled, carry blood from different organs to the heart</b>
<b>Platelets</b>	<b>Helps in blood clotting during an injury</b>
<b>Lymph / Tissue fluid</b>	<b>Fluid in intercellular space in the tissues. They carry digested and</b>
<b>Sphygmomanometer</b>	<b>Measure blood pressure</b>

# HEART



## Human Heart

2 atrium and 2 ventricle

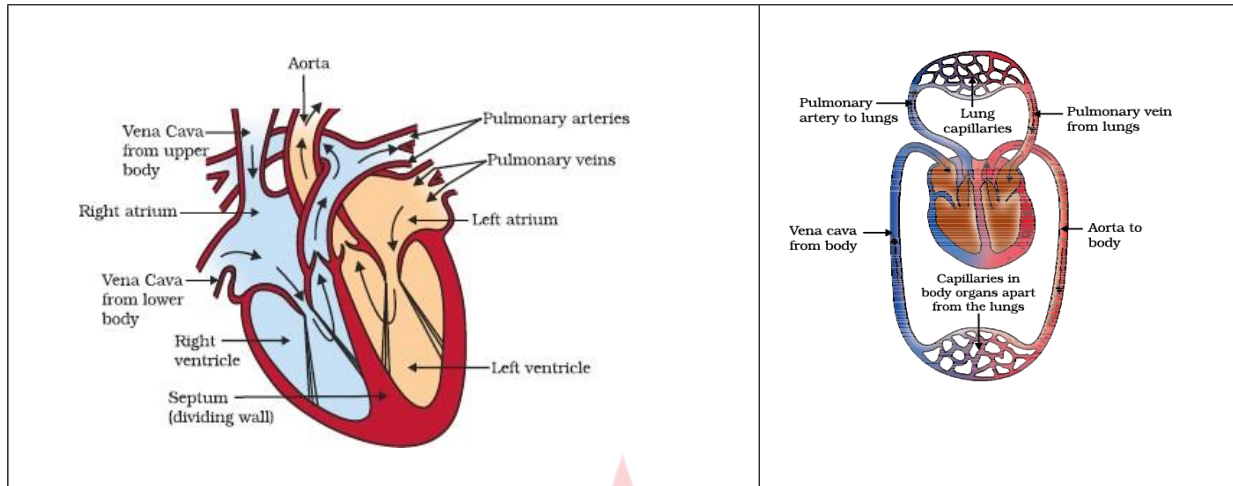
The atrium and ventricles are separated to avoid mixing of oxygenated and deoxygenated blood

The right atrium and right ventricle contain deoxygenated blood while the left atrium and left ventricle contain oxygenated blood.

Oxygenated blood from the lungs enters in left atrium via pulmonary veins. When the left atrium contracts (systole) blood enters to left ventricle. The blood goes outside to different parts of body via the aorta when the left ventricle contracts.

From different parts of the body deoxygenated blood is carried out by the superior and inferior vena cava to the right atrium.

When right atrium contracts the blood enters into right ventricle. The deoxygenated blood goes to the lungs through pulmonary arteries when right ventricle contracts.

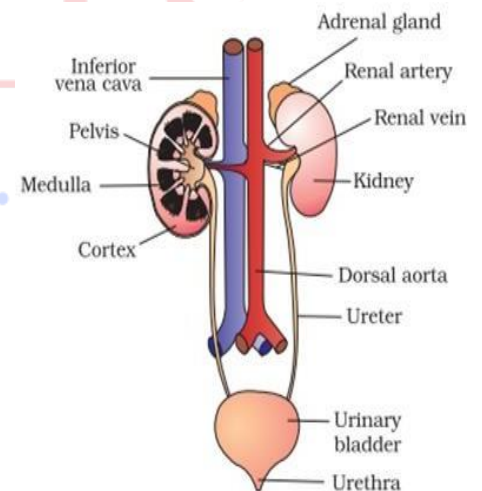


## TRANSPORTATION IN PLANTS

Stomata	Gaseous exchange, Transportation (loss of water in form of vapor)
Xylem	Water conduction channels composed of xylem tissue, vessels and tracheid
	Transport water and mineral from root to aerial part (unidirectional)
Phloem	Transport food from the leaves to other part (multidirectional).

## EXCRETION

Excretion	Removal of harmful metabolic wastes from the body
Kidney	Excretory organ of human
Nephron	Structural and functional unit of kidney
Urinary bladder	Store urine
Ureter	Connect urinary bladder with kidney
Hemodialysis	Artificial kidney, a device to remove nitrogenous waste products (urea, uric acid) from the blood.



## EXCRETION IN HUMAN BEINGS

- Basic filtration units in kidneys are clusters of thin-walled capillaries. These are associated with cup-like structure which collects the filtered urine.

- There is reabsorption of glucose, amino acids, salts, and water in tubules of nephrons.
- The concentrated urine enters into urinary bladder via the ureter and finally passes outside the body through the urethra.

## EXCRETION IN PLANTS

- Stomata play an important role as is the site for gaseous exchange and transpiration.
- Some waste products are released in form of resin, gums.
- Falling of leaves also helps in the removal of waste products.

## IMPORTANT QUESTIONS

### VERY SHORT ANSWER QUESTIONS

**1- What is the normal systolic and diastolic pressure in humans-**

- a- 120 mm Hg / 80 mm Hg
- b- 80 mm Hg/ 120 mm Hg
- c- 120 mm Hg/ 120 mm Hg
- d- 80 mm Hg/80 mm Hg

Ans: a

**2- By which apparatus we can measure blood pressure-**

- a- Barometer
- b- Hygrometer
- c- Ammeter
- d- Sphygmomanometer

Ans: d

**3- Which conducting tissue is responsible for multidirectional transport in plants-**

- a- Xylem
- b- Phloem
- c- Guard Cell
- d- Parenchyma

Ans; b

**4- Cuscuta is a special organism as it is-**

- a- Animal parasite
- b- Plant parasite
- c- Fungal parasite
- d- Blue green algae and saprophyte

Ans: b

**5- Nature of nutrition in fungi are-**

- a- Parasite
- b- Autotrophs
- c- Saprotrophs

d- Mixed autotrophs

ans: c

**6- Which acid is formed in our muscles after vigorous exercise? Ans: Lactic acid**

**7- How much energy is released when terminal phosphate linkage in ATP is broken down?**

**Ans: 30.5 KJ/mol.**

### **SHORT ANSWER TYPE QUESTIONS**

**8- What is holozoic nutrition? Give one example.**

**Ans:** The nutrition that involves the taking in of solid or liquid particles of food which have to be further broken down into simpler particles inside the organism. Example- Amoeba

**9- What is the importance of nutrients?**

**Ans: i.** Energy production

ii- growth and repair

iii- Protection from disease

**10- Why do photosynthesis consider a photochemical reaction?**

**Ans:** plants convert the energy of sunlight into stored chemical energy by forming carbohydrates from atmospheric carbon dioxide and water and releasing molecular oxygen as a byproduct.

**11- What is the role of the following in photosynthesis- i-Chloroplast ii- Water iii- CO<sub>2</sub>**

**Ans:** Chloroplast trap the sunlight (radiation) Water undergoes photolysis to evolve oxygen CO<sub>2</sub> reduces to form carbohydrates.

**12- Write the similarity between the heart and phloem.**

**Ans:** Both are conduction tissues. The heart is responsible for the conduction of blood while the phloem for food in plants.

**13- Mention the importance of Double circulation and Volves in the human heart.**

**Ans:** Double circulation importance: helps keep oxygenated (blood rich in oxygen) separate from deoxygenated (blood rich in carbon dioxide). This results in a more efficient circulation of blood.

**14- Specify the role of the conducting tissues in plants.**

**Ans:** phloem is food-conducting tissue and xylem is water-conducting tissue.

Phloem transports food in many directions from leaves to other parts of plants like another leaf, flower, stem, root, and storage part.

Xylem conducts water only in one direction from the root to the aerial parts of the plant.

**15-What is saliva? State its role in the digestion of food.**

**Ans:** Saliva contains salivary amylase enzymes that help digest the starches in our food.

An enzyme called amylase breaks down starches (complex carbohydrates) into sugars, which your body can more easily absorb.

It helps in moistens the food for easy swallowing.

**16- (a) What is the peristaltic movement?**

**(b) 'Stomata remain closed in desert plants during daytime'. How do they do photosynthesis?**

**Ans:** (a) The relaxation of gut muscles to move the partially digested food downwards throughout the alimentary canal is called peristaltic movement.

(b) In desert plants, stomata open at night and take in carbon dioxide (CO<sub>2</sub>). Stomata remain closed during the daytime to prevent the loss of water by transpiration. They store the CO<sub>2</sub> in their cells until



the sun comes out so that they can carry on with photosynthesis during the daytime.

## LONG ANSWER TYPE QUESTIONS

### 17- Differentiate the followings-

- I. Vena cava and Aorta    II- Pulmonary artery and Pulmonary vein    III- Anaerobic respiration and fermentation    IV- Bronchi and bronchiole

#### Ans:

- Vena cava: carries deoxygenated blood from body parts to the heart  
Aorta: carries oxygenated blood from the heart to the body parts
- Pulmonary artery: carries deoxygenated blood from the heart to the lungs  
Pulmonary vein: carries oxygenated blood from the lungs to the heart
- Anaerobic respiration: respiration without oxygen  
Fermentation: respiration without oxygen in microorganisms
- Bronchi: extends from the trachea, have incomplete cartilage ring  
Bronchioles: extended from bronchi

### 18-Draw a cross-section of the leaf and label the stomata. Also mention any two roles of stomata in plants.

Ans: Fig 6.1, page 96, NCERT

### 19-Draw a labeled diagram of the structural and functional unit of the kidney. Also, mention its role.

Ans: Fig: 6.14, page 111, NCERT

Filtration of blood, reabsorption, secretion and excretion of useful and harmful substances present in the blood.

### 20-Give reasons:

- Ventricles have thicker muscular walls than atria.**
- The transport system in plants is slow.**
- Blood circulation differs in aquatic vertebrates from that in terrestrial vertebrates.**
- During the daytime, water and minerals travel faster through the xylem as compared to the night.**
- Veins have valves whereas arteries do not.**

#### Ans:

(i) Ventricles pump blood into various organs with high pressure so they have thicker walls.  
(ii) Plants are non-motile, less active, and require less energy so their cells do not need to be supplied with materials so quickly.

(iii) The aquatic vertebrates like fish have gills to oxygenate blood. Fishes have single circulation. Terrestrial vertebrates like birds and humans have four-chambered hearts and show double circulation.

(iv) it is due to a high transpiration rate in day time.

(v) The lumen of veins has valves, which allow the blood in them to flow in only one direction. Thus preventing the backflow of blood.

### 21- Describe the double circulation of blood in human beings. Why is it necessary?



**Ans:** In the human heart, blood passes through the heart twice in one cardiac cycle. This type of circulation is called double circulation. Double circulation ensures complete segregation of oxygenated and deoxygenated blood.

It includes - Pulmonary circulation and Systemic circulation.

In Pulmonary circulation: The right ventricle pumps deoxygenated blood into the lungs where it is oxygenated. The oxygenated blood is brought back to the left atrium, and from there it is pumped into the left ventricle and finally, blood goes into the aorta for systemic circulation.

In Systemic circulation: The oxygenated blood is pumped to various parts of the body from the left ventricle. The deoxygenated blood from different parts of the body passes through the vena cava to reach the right atrium. The right atrium transfers the blood into the right ventricle.

**22-Mention the location of four major glands associated with the digestive system of humans and explain the function of each.**

**Ans:**

i- Salivary Glands- There are three pairs of salivary glands (Parotid, submaxillary and sublingual) that secrete saliva. Saliva moistens the food, disinfects food by lysozyme and digests starch by salivary amylase.

ii-Gastric Glands- these are present inside the stomach. Gastric glands secrete HCl- disinfect food, provide an acidic medium for digestive juices.

Pepsin - for partial digestion of proteins to form peptones and proteases

iii-Liver- secretes bile, which neutralizes the acidity of chyme and emulsifies fat.

iv-Pancreas- Lies in the loop of the duodenum below the stomach.

It secretes trypsin (digest protein), lipase (break down of fat)

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