Gyaan Roots Classes

"From Roots to Result"

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Assignment Sheet Subject:-**Biology**

Class:-**X**

CHAPTER– LIFE PROCESSES

LIFE PROCESS

The maintenance of living organisms must go on even at the conditions, when they are not physically active. Even when we sit idle and during sleeping, this maintenance job through cells functioning has to go on. The life process includes the activities performed by the different organs to maintain the body.

Some of the life processes in the living beings are described below:

- **Nutrition**

The process of obtaining energy through consumption of food is called asnutrition.

- **Respiration**

The process of acquiring oxygen through breathing and make it available to cells for the process of breaking down of organic substances into simpler compounds is called as respiration.

- **Transportation**

Transportation is the process by which the food and oxygen is carried from one organ to other organs in the body.

Excretion

It is the process by which the metabolic waste by-products are removed from the different organs and released out from the body.

Question 1: Why is diffusion insufficient to meet the oxygen requirements of multi-cellular organisms like humans?

Answer: Multi cellular organisms such as humans possess complex body designs. They have specialised cells and tissues for performing various necessary functions of the body such as intake of food and oxygen. Unlike unicellular organisms, multicellular cells are not in direct contact with the outside environment. Therefore, diffusion cannot meet their oxygen requirements.

Question2: What criteria do we use to decide whether some thing is alive?

Answer: Any visible movement such as walking, breathing, or growing is generally used to decide whether something is alive or not. However, a living organism can also have movements, which are not visible to the naked eye. Therefore, the presence of life processes is a fundamental criterion that can be used to decide whether something is alive or not.

Question3:What are outside raw materials used for by an organism?

Answer : An organism uses outside raw materials mostly in the form of food and oxygen. The raw materials required by an organism can be quite varied depending on the complexity of the organism and its environment.

Question4: What processes would you consider essential for maintaining life?

Answer : Life processes such as nutrition, respiration, transportation, excretion, etc. are essential for maintaining life.

NUTRITION

The process by which an organism takes food and utilizesitis called nutrition.

NEED OF NUTRITION

Organisms need energy to perform various activities. The energy is supplied by the nutrients. Organisms need various raw materials for growth and repair. These raw materials are provided by nutrients.

NUTRIENTS

Materials which provide nutrition to organisms are called nutrients. Carbohydrates, proteins and fats are the main nutrients and are called macronutrients. Minerals and vitamins are required in small amounts and hence are called micronutrients.

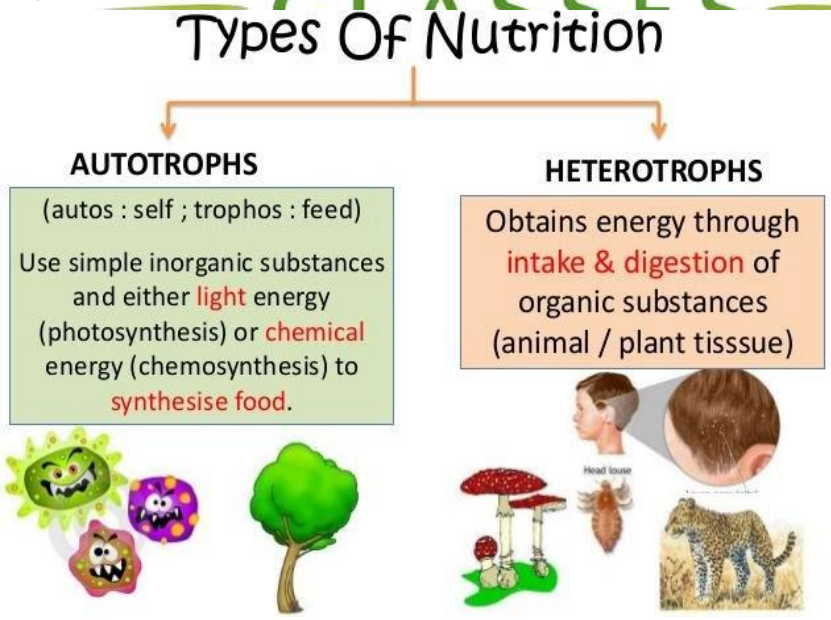
TYPESOFNUTRITION:

1. **Autotrophic Nutrition:** The mode of nutrition in which an organism prepares its own food is called autotrophic nutrition. Green plants and blue-green algae follow the autotrophic mode of nutrition.
2. **Heterotrophic Nutrition:** The mode of nutrition in which an organism takes food from another organism is called heterotrophic nutrition. Organisms; other than green plants and blue-green algae follow heterotrophic mode of nutrition.

AUTO TROPHIC NUTRITION:

Auto trophic organisms are able to produce organic matter from simple in organic materials. They consequently create their own food—but require a source of energy to do this.

- Photo autotrophs harvest energy from light to produce organic matter.
- Chemoautotrophs use energy from inorganic reactions in the environment to drive the creation of organic matter.



HETEROTROPHIC NUTRITION

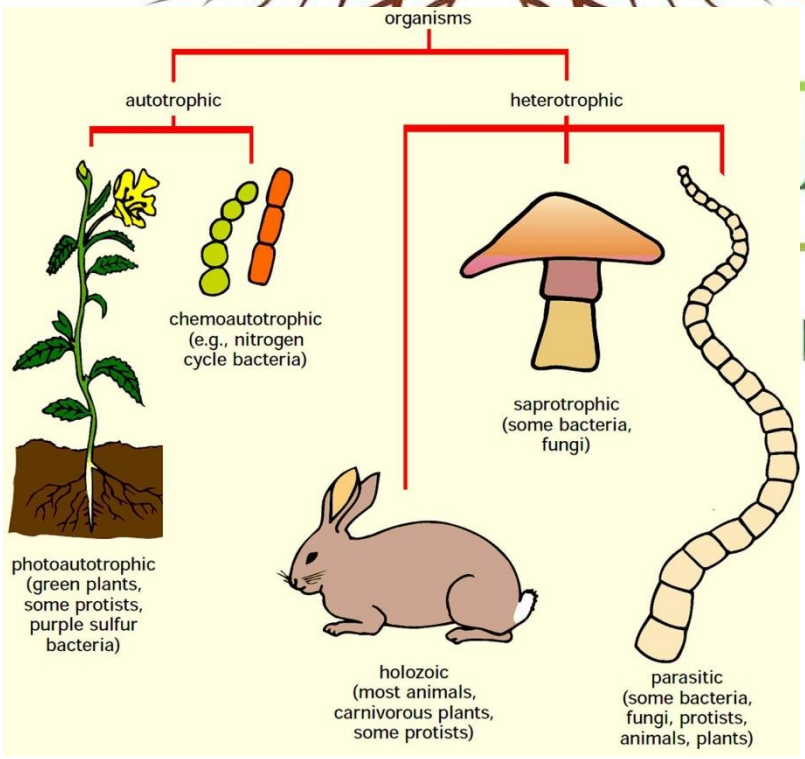
Heterotrophic nutritrion is typical of animals. These organisms eat organic matter in other organisms—either alive (as hunters) or dead (as scavengers).

Sapro trophic organisms are the decay organisms. They digest dead material sus in genzymes that they secrete externally. Fungi and many bacteria are saprotrophes.

Parasites (bio trophs) feed on living organisms without killing them.

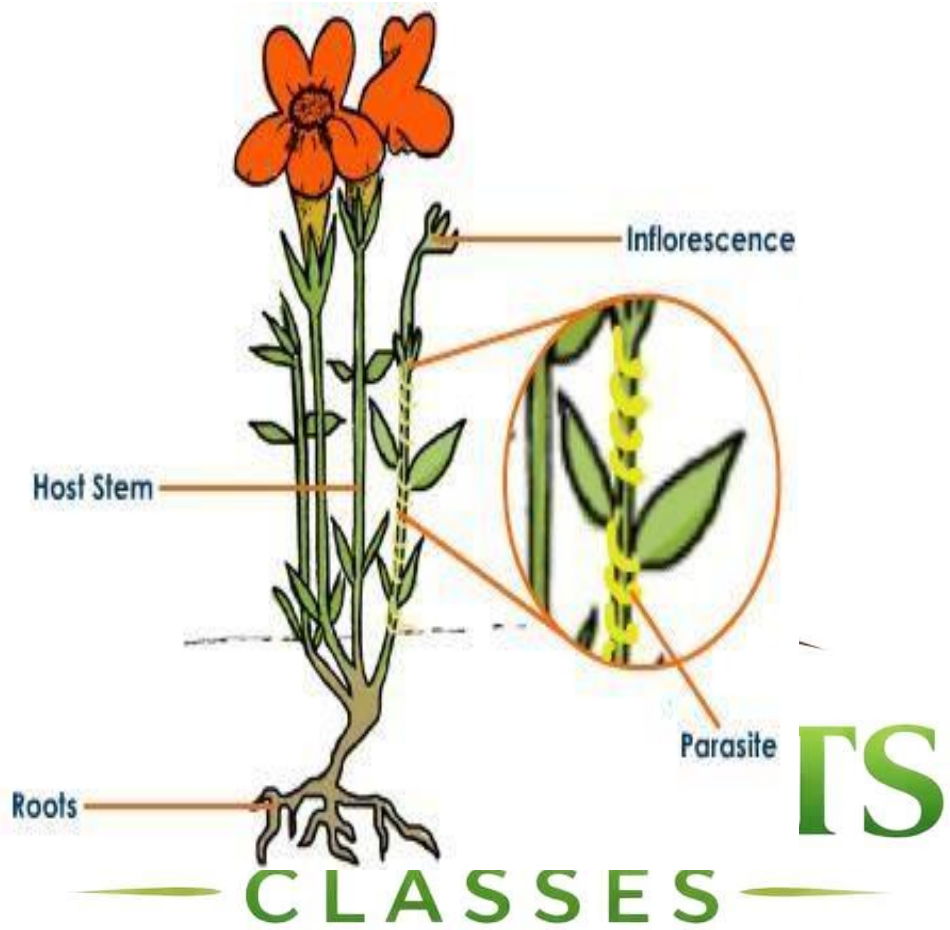
Heterotrophic nutrition can be further divided into two types, viz. saprophytic nutrition and holozoic nutrition.

- **Saprophytic Nutrition:** In saprophytic nutrition; the organism secretes the digestive juices on the food. The food is digested while it is still to be ingested. The digested food is then ingested by the organism. All the decomposers follow saprophytic nutrition. Some insects; like house flies; also follow this mode of nutrition.
- **Holozoic Nutrition:** In holozoic nutrition; the digestion happens inside the body of the organism, i.e. after the food is ingested. Most of the animals follow this mode of nutrition.

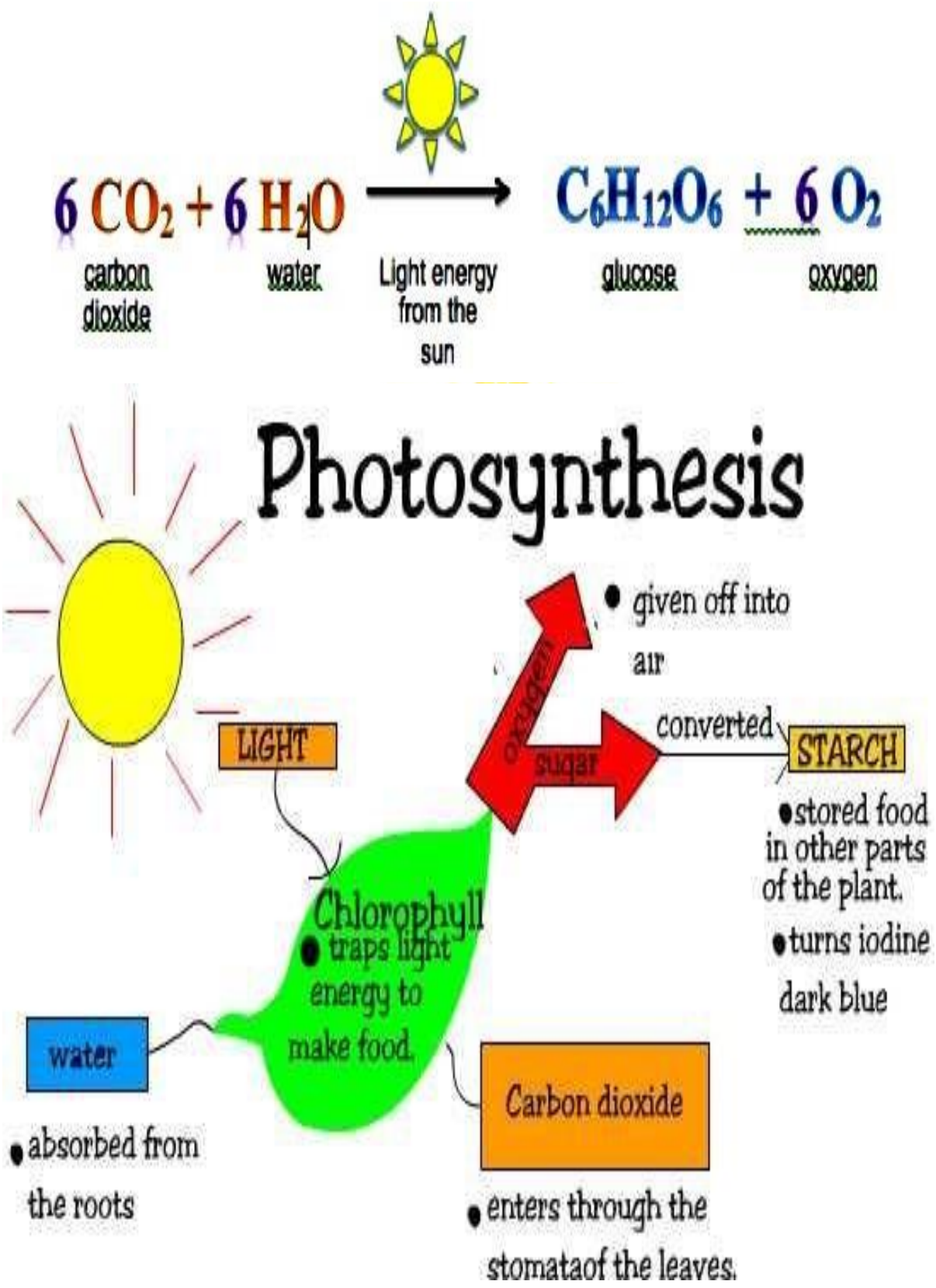


PLANTNUTRITION

Green plants prepare their own food. They make food in the presence of sunlight. Sunlight provides energy, carbon dioxide and water are the raw materials and chloroplast is the site where food is made.



PHOTOSYNTHESIS: The process by which green plants prepare food is called photosynthesis. During this process; the solar energy is converted into chemical energy and carbohydrates are formed. Green leaves are the main sites of photosynthesis. The green portion of the plant contains a pigment chloroplast; which contains chlorophyll. The whole process of photosynthesis can be shown by following equation:


6 CO2 + 6 H2O
carbon dioxide
water
Light energy from the sun
C6H12O6 + 6 O2
glucose
oxygen
Photosynthesis
given off into air
oxygen
converted
sugar
STARCH
LIGHT
stored food in other parts of the plant.
turns iodine dark blue
Chlorophyll
traps light energy to make food.
water
absorbed from the roots
Carbon dioxide
enters through the stomataof the leaves.

STEPS OF PHOTOSYNTHESIS:

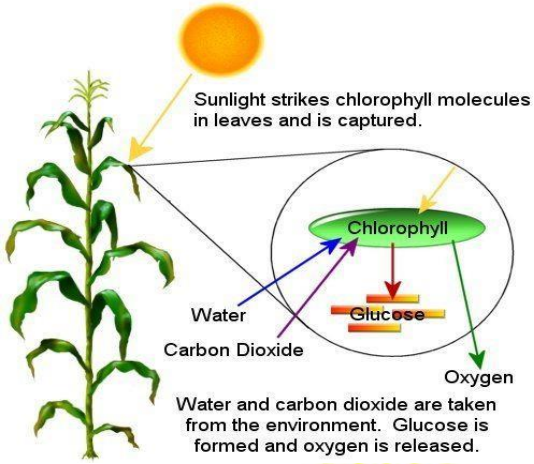
- Sun light activate schlorophyll; which leads to splitting of water molecule.
- The hydrogen; released by splitting of water molecule is utilized for reduction of carbon dioxide to produce carbohydrates.
- Oxygen is the byproduct of photosynthesis.
- Carbo hydrate is subsequently converted into starch and is stored in leaves and other storage parts.
- The splitting of water molecules is part of the light reaction.
- Other steps are part of the dark reaction during photosynthesis.

HOW DO RAW MATERIALS FOR PHOTOSYNTHESIS BECOME AVAILABLE TO THE PLANT?

- Water comes from soil; through the xylem tissue in roots and stems.
- Carbon dioxide comes in the leaves through stomata.

SIGNIFICANCE OF PHOTOSYNTHESIS:

- Photosynthesis is the main way through which the solar energy is made available for different living beings.
- Green plants are the main producers of food in the ecosystem.All other organisms directly or indirectly depend on green plants for food.
- The process of photosynthesis alsohelps in maintaining the balance of carbon dioxide and oxygen in the air.

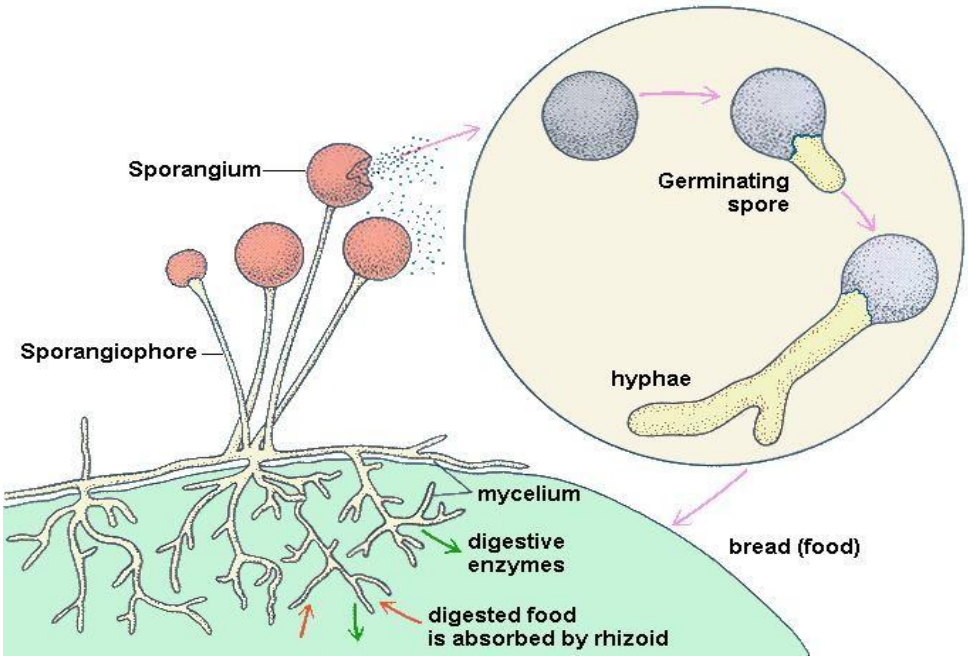


ANIMALNUTRITION

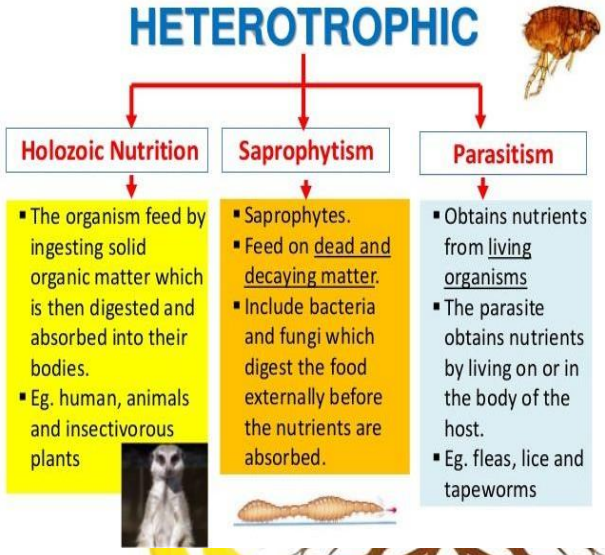
Heterotrophic Nutrition: When an organism takes food from another organism, it is called heterotrophic nutrition. Different heterotrophic organisms follow different methods to take and utilize food. Based on this, heterotrophic nutrition can be divided into two types:

Saprophytic Nutrition: In saprophytic nutrition, the digestion of food takes place before ingestion of food. This type of nutrition is usually seen in fungi and some other microorganisms. The organism secretes digestive enzymes on the food and then ingests the simple substances. Saprophytes feed on dead materials and thushelpin

Decomposition dead remains of plants and animals.



Holozoic Nutrition: In holozoic nutrition, the digestion of food follows after the ingestion of food. Thus, digestion takes place inside the body of the organism. Holozoic nutrition

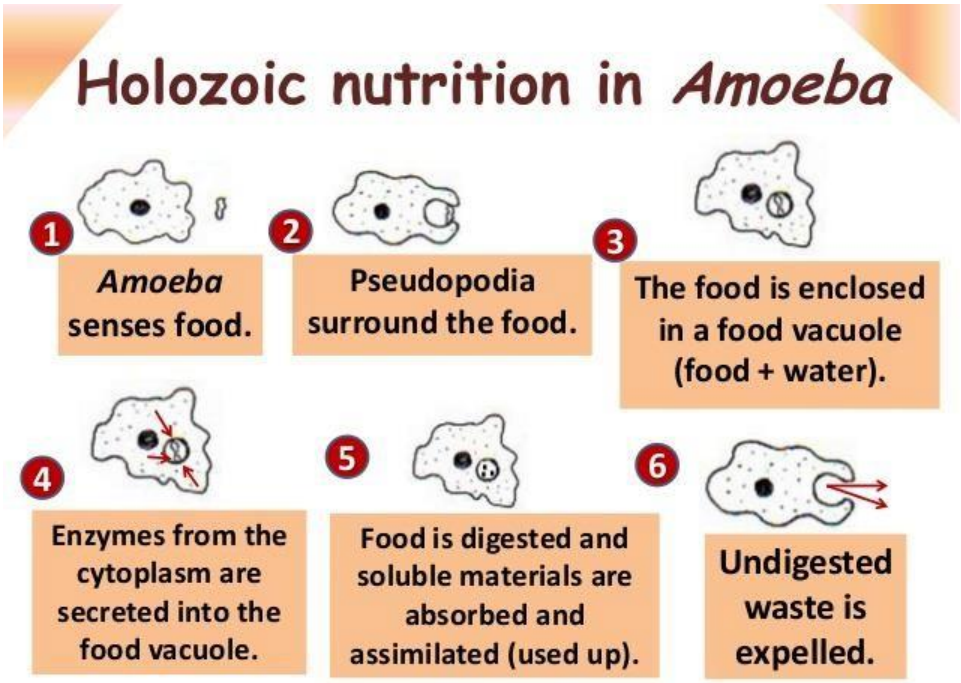


happens in five steps, viz. ingestion, digestion, absorption, assimilation and egestion.

STEPS OF HOLOZOIC NUTRITION

- Ingestion: The process of taking in the food is called ingestion.
- Digestion: The process of breaking complex food substances into simple molecules is called digestion. Simple molecules; thus obtained; can be absorbed by the body.
- Absorption: The process of absorption of digested food is called absorption.
- Assimilation: The process of utilization of digested food; for energy and for growth and repair is called assimilation.
- Egestion: The process of removing un digested food from the bodyiscalledegestion.

NUTRITIONINAMOEBA:



Amoeba is a unicellular animal which follows holozoic mode of nutrition. The cell membrane of amoeba keeps on protruding into pseudopodia. Amoeba surrounds a food particle with pseudopodia and makes a food vacuole. The food vacuole contains the food particle and water. Digestive enzymes are secreted in the food vacuole and digestion takes place. After that, digested food is absorbed fromthe food vacuole. Finally, the food vacuole moves near the cell membrane and undigested food is expelled out.

NUTRITIONINHUMANBEINGS

Human beings are complex animals; which have a complex digestive system. The human digestive system is composed of an alimentary canal and some accessory glands. The alimentary canal is divided into several parts, viz. oesophagus, stomach, small intestine, large intestine, rectum and anus. Salivary gland, liver and pancreas are the accessory glands whichlie outside the alimentary canal.

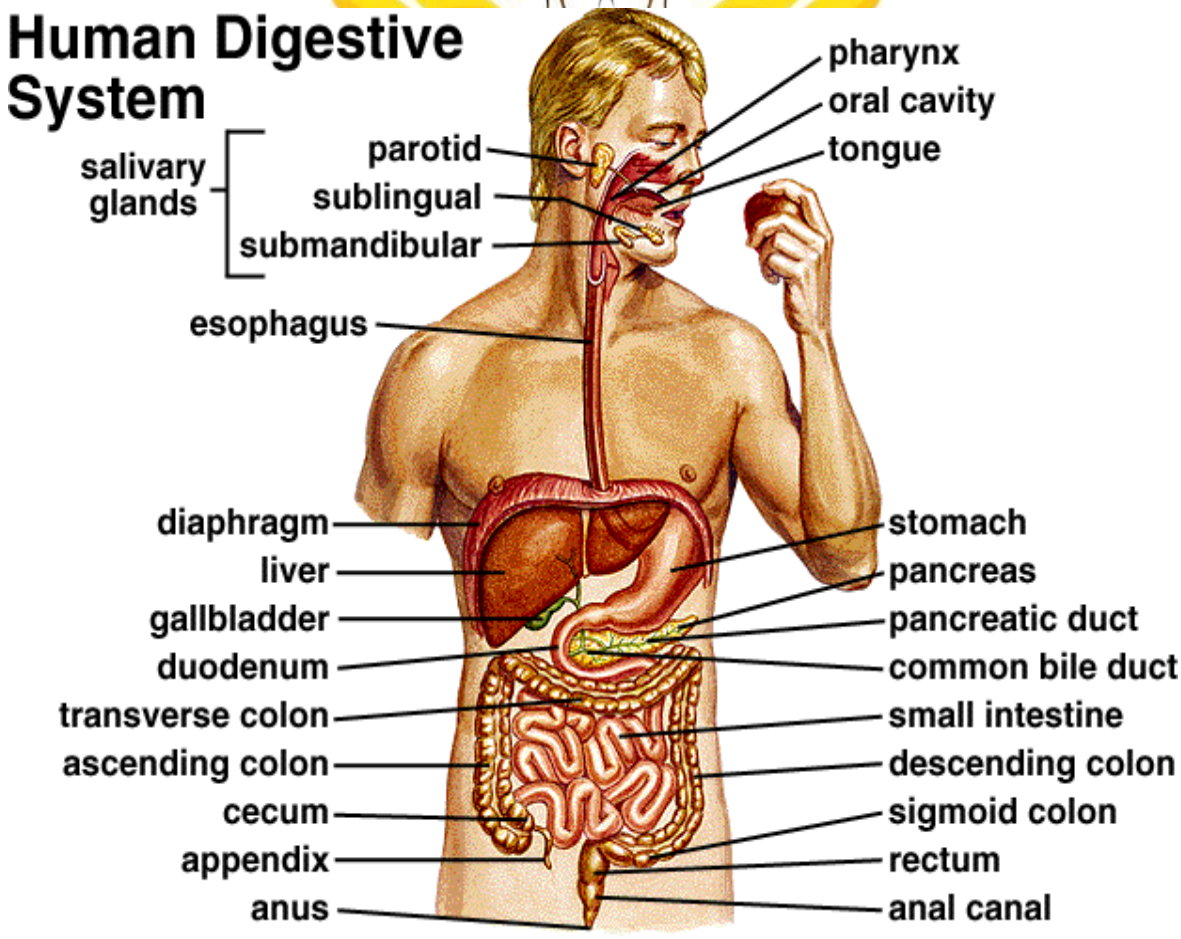
STRUCTURE OF THE HUMAN DIGESTIVE SYSTEM

Mouth or Buccal Cavity: The mouth has teeth and tongue. Salivary glands are also present in the mouth. The tongue has gustatory receptors which perceive the sense of taste.

Tongue helps in turning over the food, so that saliva can be properly mixed in it.

Teeth help in breaking down the food into smaller particles so that swallowing of foodbecomes easier. There are four types of teeth in human beings. The incisor teeth are used for cutting the food. The canine teeth are used for tearing the food and for cracking hard substances. The premolars are used for coarse grinding of food. The molars are used for fine grinding of food.

Salivary glands secrete saliva. Saliva makes the food slippery which makes it easy to swallow the food. Saliva also contains the enzyme salivary amylase or ptyalin. Salivary amylase digests starch and converts it into sucrose.



Stomach: Stomach is a bag-like organ. Highly muscular walls of the stomach help in churning the food. The walls of stomach secrete hydrochloric acid. Hydrochloric acid kills the germs which may be present in food. Moreover, it makes the medium inside stomach as acidic. The acidic medium is necessary for gastric enzymes to work. The enzyme pepsin; secreted in stomach; does partial digestion of protein. The mucus; secreted by the walls of the stomach saves the inner lining of stomach from getting damaged from hydrochloric acid.

Small Intestine: It is a highly coiled tube-like structure. The small intestine is longer than the large intestine but its lumen is smaller than that of the large intestine. The small intestine is divided into three parts, viz. duodenum, and jejunum and ileum.

Liver: Liver is the largest organ in the human body. Liver manufactures bile; which gets stored in gall bladder. From the gallbladder, bile is released as and when required.

Pancreas: Pancreas is situated below the stomach. It secretes pancreatic juice which contains many digestive enzymes.

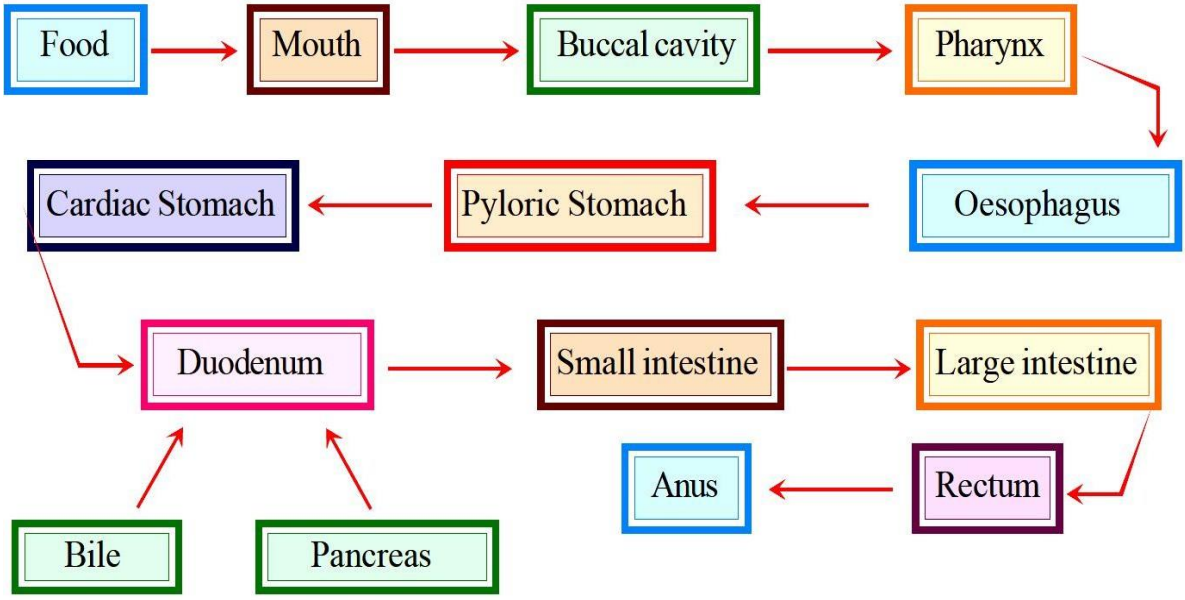
Bile and pancreatic juice go to the duodenum through a hepato-pancreatic duct. Bile breaks down fat into smaller particles. This process is called emulsification of fat. After that, the enzyme lipase digests fat into fatty acids and glycerol. Trypsin and chymotrypsin are enzymes which digest protein into amino acids. Complex carbohydrates are digested into glucose. The major part of digestion takes place in the duodenum.

No digestion takes place in jejunum. The inner wall in the ileum is projected into numerous finger-like structures; called villi. Villi increase the surface area inside the ileum so that optimum absorption can take place. Moreover, villi also reduce the lumen of the ileum so that food can stay for longer duration in it; for optimum absorption. Digested food is absorbed by villi.

Large Intestine: Large intestine is smaller than small intestine. Undigested food goes into the large intestine. Some water and salt are absorbed bythe walls of the large intestine.

After that, the undigested food goes to the rectum; from where it is expelled out through the anus.

Flowchart of human digestive system



Health aspects of the alimentary canal

Question1: What are the differences between autotrophic nutrition and heterotrophic nutrition?

Answer:

Autotrophic nutrition	**Heterotrophic nutrition**
1. Food is synthesized from simple inorganic raw material ssuchasCO2 and water.	**1.**Food is obtained directly or indirectly from autotrophs. This food is broken Down with the help of enzymes.
2.Presence of green pigment (chlorophyll) is necessary.	**2.**No pigment is required in this type of nutrition.
3.Food is generally prepared during daytime.	**3.**Food can be prepared at all times.
4.Al green plants and some bacteria Have this type of nutrition.	**4.**All animals and fungi have this type of nutrition.

Question2: Where do plants get each of the raw materials required for photosynthesis?

Answer : The following raw materials are required for photosynthesis:

i. The raw material CO2 enters from the atmosphere through stomata.
ii. Water is absorbed from the soil by the plant roots.
iii. Sunlight, an important component to manufacture food, is absorbed by the chlorophyll and other green parts of the plants.

Question3: What is the role of the acid in our stomach? Answer: Following are the roles of acid in our stomach:

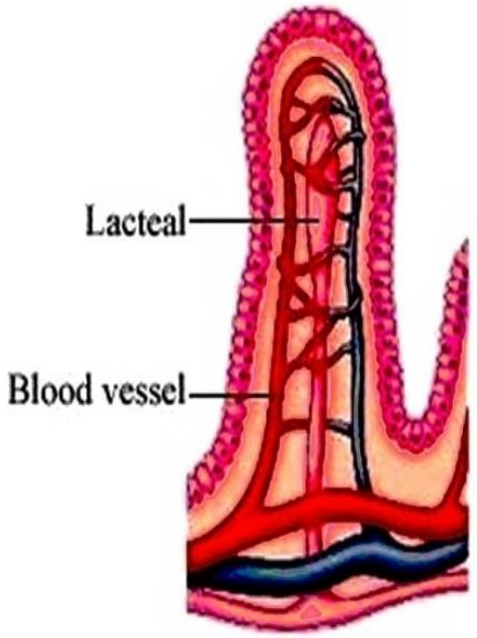
i. The hydrochloric acid present in our stomach dissolves bits of food and creates an acidic medium. In this acidic medium, enzyme pepsinogen is converted to pepsin, which is a protein-digesting enzyme.
ii. The hydrochloric acid kills the harmful lmicro best hatenter with food and thus prevents infection of digestive tract.

Question 4: What is the function of digestive enzymes?

Answer: Digestive enzymes such as amylase, lipase, pepsin, trypsin, etc. help in the breaking down of complex food particles into simple ones. These simple particles can be easily absorbed by the blood and thus transported to all the cells of the body.

Question 5: How is the small intestine designed to absorb digested food?

Answer : The small intestine has millions of tiny finger-like projections called villi. These villi increase the surface area for more efficient food absorption. Within these villi, many blood vessels are present that absorb the digested food and carry it to the blood stream. From the blood stream, the absorbed food is delivered to each and every cell of the body.



RESPIRATION

The process by which a living being utilizes the food to get energy is called respiration. Respiration is an oxidation reaction in which carbohydrate is oxidized to produce energy. Mitochondrion is the site of respiration and the energy released is stored in the form of ATP (Adenosine tri phosphate). ATP is stored in mitochondria and is released as per need.

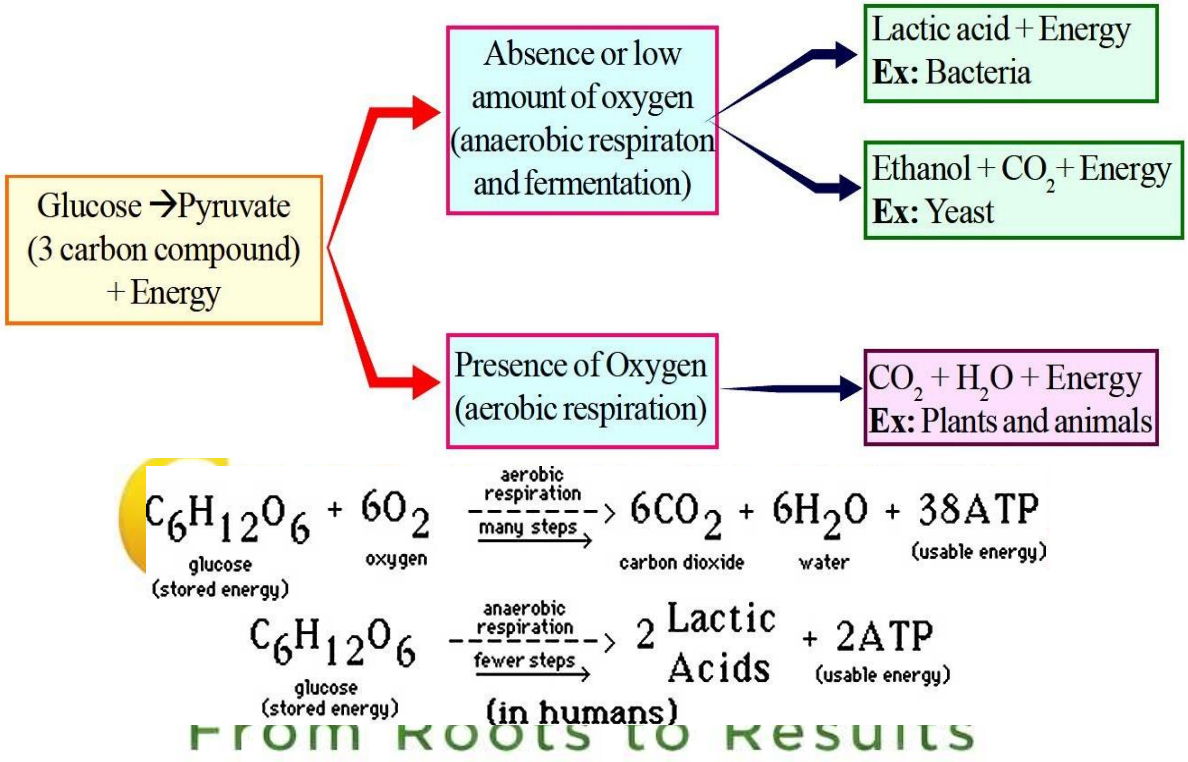
STEPS OF RESPIRATION:

- **Breaking down glucose into pyruvate:** This step happens in the cytoplasm. Glucose molecule is broken down into pyruvic acid. Glucose molecule is composed of6 carbon atoms, while pyruvic acid is composed of 3 carbon atoms.
- **Fate of Pyruvic Acid:** Further breaking down of pyruvic acid takes place in mitochondria and the molecules formed depend on the type of respiration in a particular organism.

Respirationisoftwo types, viz. aerobic respiration and an aerobic respiration.

TYPESOFRESPIRATION:

- **Aerobic Respiration:** This type of respiration happens in the presence of oxygen. Pyruvic acid is converted into carbon dioxide. Energy is released and water moleculeis also formed at the end of this process.
- **Anaerobic Respiration:** This type of respiration happens in the absence of oxygen. Pyruvic acid is either converted into ethyl alcoholor lactic acid. Ethyl alcohol is usually formed in case of anaerobic respiration in microbes; like yeast or bacteria. Lactic acid is formed in some microbes as well as in the muscle cells.



Pain in Leg Muscles on Running: When someone runs too fast, he may experience a throbbing pain in the leg muscles. This happens because of anaerobic respiration taking place in the muscles. During running, the energy demand from the muscle cells increases. This is compensated by anaerobic respiration and lactic acid is formed in the process. The deposition of lactic acid causes the pain the leg muscles. The pain subsides after taking rest for some time.

Exchange of Gases: For aerobic respiration; organisms need a continuous supply of oxygen, and carbon dioxide produced during the process needs to be removed from the body. Different organisms use different methods for intake of oxygen and expulsion of carbon dioxide. Diffusion is the method which is utilized by unicellular and some simple organisms for this purpose. In plants also, diffusion is utilized for exchange of gases. In complex animals, respiratory system does the job of exchange of gases. Gills are the respiratory organs for fishes. Fishes take in oxygen; which is dissolved in water; through gills. Since availability of oxygen is less in the aquatic environment so the breathing rate of aquatic organisms is faster. Insects have a system of spiracles and tracheae which is used for taking in oxygen.

Terrestrial organisms have developed lungs for exchange of gases. Availability of oxygen isnot a problem in the terrestrial environment so breathing rate is slower compared to what it isin fishes.

HUMAN RESPIRATORYSYSTEM:

The human respiratory system is composed of a pair of lungs. These are attached to a system of tubes which open on the outside through the nostrils. Following are the main structures in the human respiratory system:

Nostrils: There two nostrils which converge to form a nasal passage. The inner lining of the nostrils is lined by hairs and remains wet due to mucus secretion. The mucus and the hairs help in filtering the dust particles out from inhaled air. Further, air is warmed up when it enters the nasal passage.

Pharynx: It is a tube like structure which continues after the nasal passage.

Larynx: This part comes after the pharynx. This is also called the voice box.

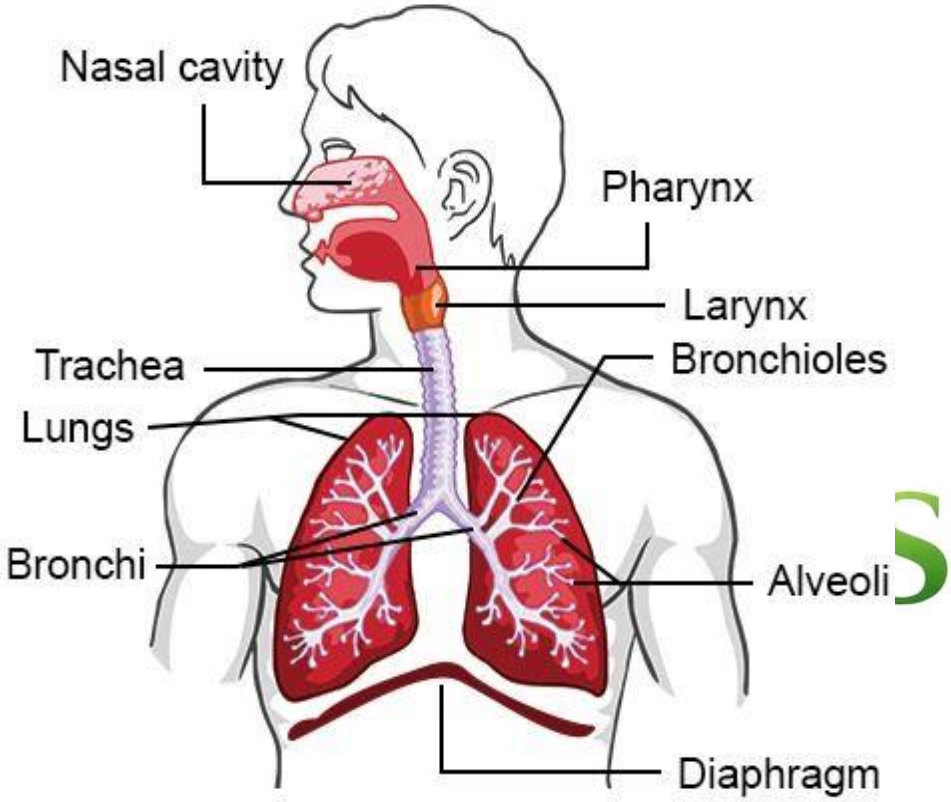
Trachea: This is composed of rings of cartilage. Cartilaginous rings prevent the collapse of trachea in the absence of air.

Bronchi: A pair of bronchi comes out from the trachea; with one bronchus going to each

lung.

Bronchioles: A bronchus divides into branches and sub-branches; inside the lung.

Alveoli: These are air-sacs at the end of bronchioles. Alveolus is composed of a very thin membrane and is the place where blood capillaries open. This is alveolus; where oxygen mixes with the blood and carbon dioxide exits from the blood. The exchange of gases; in alveoli; takes place due to pressure differential.



Breathing Mechanism: The breathing mechanism of lungs is controlled by the diaphragm and the inter costalis muscles. Diaphragm is a membrane which separates the thoracic chamber from the abdom in alcavity. When diaphragm moves down, the lungs expand and air is inhaled. When diaphragm moves up, the lungs contract and air is exhaled.

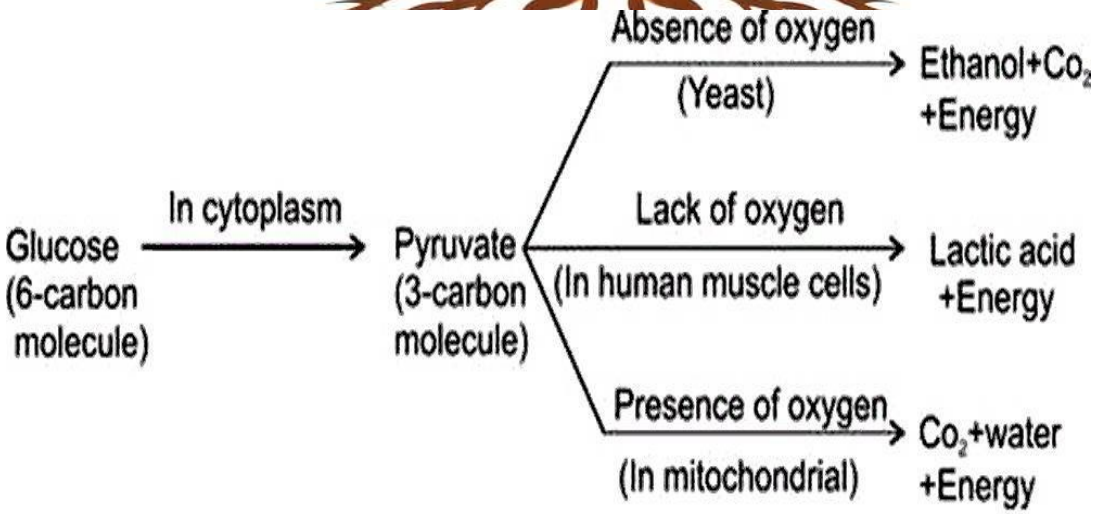
Question1:What advantage over an aquatic organism does aterrestrial organism have with regard to obtaining oxygen for respiration?

Answer : Terrestrial organisms take up oxygen from the atmosphere whereas aquatic animals need to utilize oxygen present in the water. Air contains more O2 as compared to water. Since the content ofO2 in air is high, the terrestrial animals do not have to breathe faster to get more oxygen. Therefore, unlike aquatic animals, terrestrial animals do not have to show various adaptations for better gaseous exchange.

Question 2: What are the different ways in which glucose is oxidized to provide energy in various organisms?

Answer: Glucose is first broken down in the cell cytoplasmin to a three carbon molecule called pyruvate. Pyruvate is further broken down by different ways to provide energy.

he break down of glucose by different path ways can be illustrated as follows.

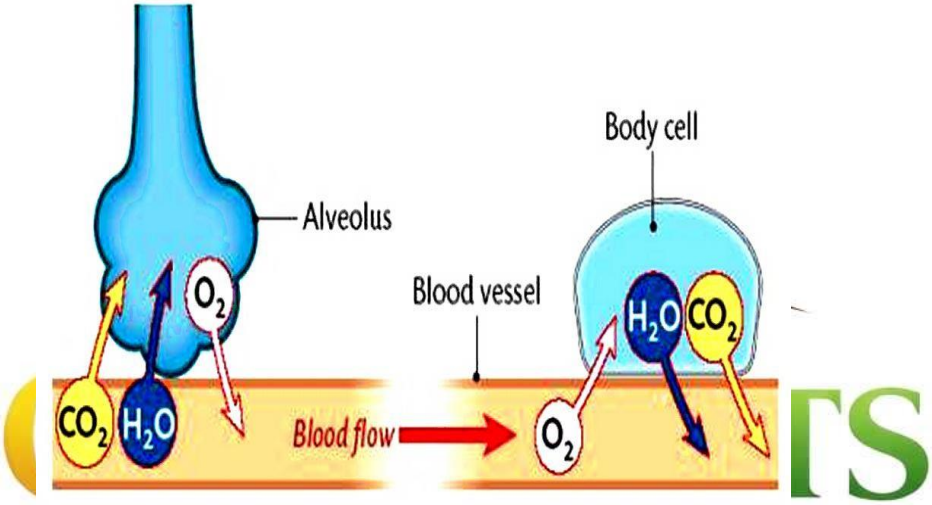


(Break down of glucose by various pathways)

In yeast and human muscle cells, the breakdown of pyruvate occurs in the absence of oxygen whereas in mitochondria, the breakdown of pyruvate occurs in the presence of oxygen.

Question3: How is oxygen and carbon dioxide transported in human beings?

Answer : Haemoglobin transports oxygen molecule to all the body cells for cellular respiration. The haemoglobin pigment present in the blood gets attached to four O2 molecules that are obtained from breathing. It thus forms oxyhaemoglobin and the blood becomes oxygenated. This oxygenated blood is then distributed to all the body cells by the heart. After giving away O2 to the body cells, blood takes away CO2 which is the end product of cellular respiration. Now the blood becomes de-oxygenated.



Since haemoglob in pigment has less affinity for CO2, CO2 is mainly transported in the dissolved form. This de-oxygenated blood gives CO2 to lung alveoli and takes O2 inreturn.

Question 4: How are the lungs designed in human beings to maximize the area for exchange of gases?

Answer: The exchange of gases takes place between the blood of the capillaries that surround the alveoli and the gases present in the alveoli. Thus, alveoli are the site for exchange of gases. The lungs get filled up with air during the process of inhalation as ribs

are lifted up and diaphragm is flattened. The air that is rushed inside the lungs fills the numerous alveolipresent in the lungs.

Each lung contains 300-350 million alveoli. These numerous alveoli increase the surface area for gaseous exchange making the process of respiration more efficient.

TRANSPORTATIONINANIMALS

Circulatory System: The circulatory system is responsible for transport of various substances in human beings. It is composed of the heart, arteries, veins and blood capillaries. Blood plays the role of the carrier of substances.

HEART

Heart is a muscular organ; which is composed of cardiac muscles. It is so small that it can fit inside and adult's fist. The heart is a pumping organ which pumps the blood. The human heart is composed of four chambers, viz. right auricle, right ventricle, left auricle and left ventricle.

Systole: Contraction of cardiac muscles is called systole.

Diastole: Relaxation of cardiac muscles is called diastole.

Arteries: These are thick-walled blood vessels which carry oxygenated blood from the heart to different organs. Pulmonary arteries are exceptions because they carry deoxygenated blood from the heart to lungs; where oxygenation of blood takes place.

Veins: These are thin-walled blood vessels which carry deoxygenated blood from different organs to the heart. Pulmonary veins are exceptions because they carry oxygenated blood from lungs to the heart. Valves are present in veins to prevent backflow of blood.

Capillaries: These are the blood vessels which have single-celled walls.

Blood: Blood is a connective tissue which plays the role of the carrier for various substancesin the body. Blood is composed of plasma, blood cells and platelets.

Blood Plasma: Blood plasma is a pale coloured liquid which is mostly composed of

water. Blood plasma forms the matrix of blood.

Blood Cells: There are two types of blood cells, viz. Red Blood Cells (RBCs) and White Blood Cells (WBCs).

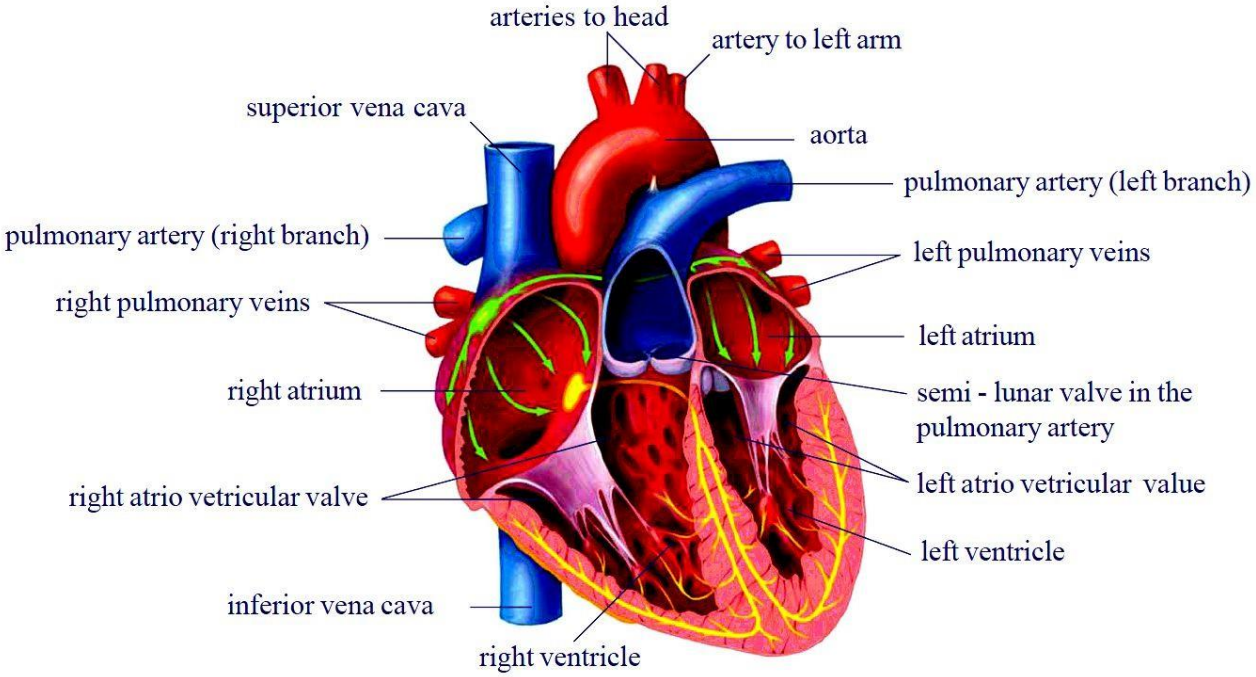
Red Blood Corpuscles (RBCs): These are of red colour because of the presence of haemoglobin which is a pigment. Haemoglobin readily combines with oxygen and carbon dioxide. The transport of oxygen happens through haemoglobin. Some part of carbon dioxideis also transported through haemoglobin.

WhiteBlood Corpuscles(WBCs): These are of pale white colour. They play important role in the immunity.

Platelets: Platelets are responsible for blood coagulation. Blood coagulation is a defense mechanism which prevents excess loss of blood; in case of an injury.

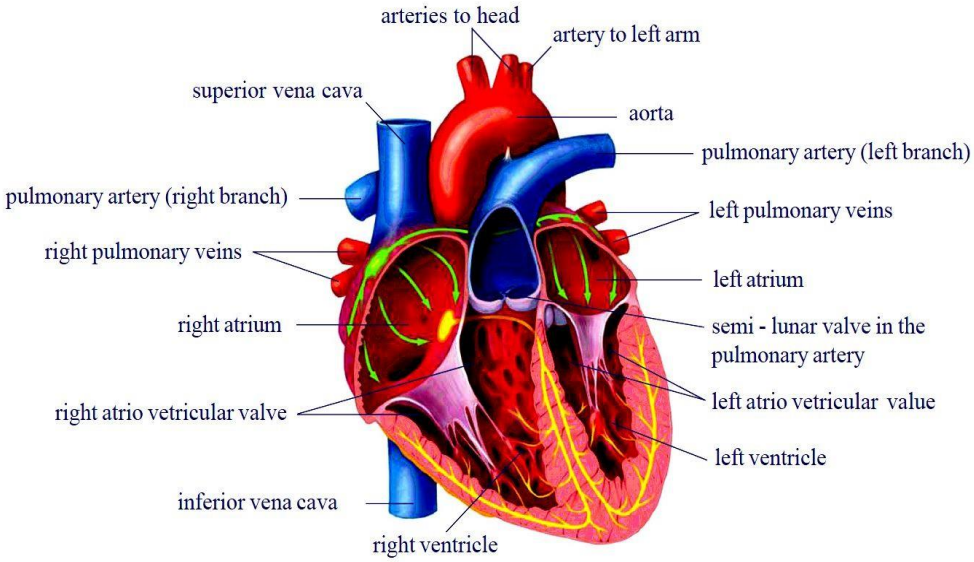
Lymph: Lymph is similar to blood but RBCs are absent in lymph. Lymph is formed from the fluid which leaks from blood capillaries and goes to the intercellular spaces in the tissues. This fluid is collected through lymphvessels and finally returns to the blood capillaries. Lymphalso plays an important role in the immune system.

Double Circulation: In the human heart, blood passes through the heart twice in one cardiac cycle. This type of circulation is called duble circulation. One complete heart beat



Internal structure of heart

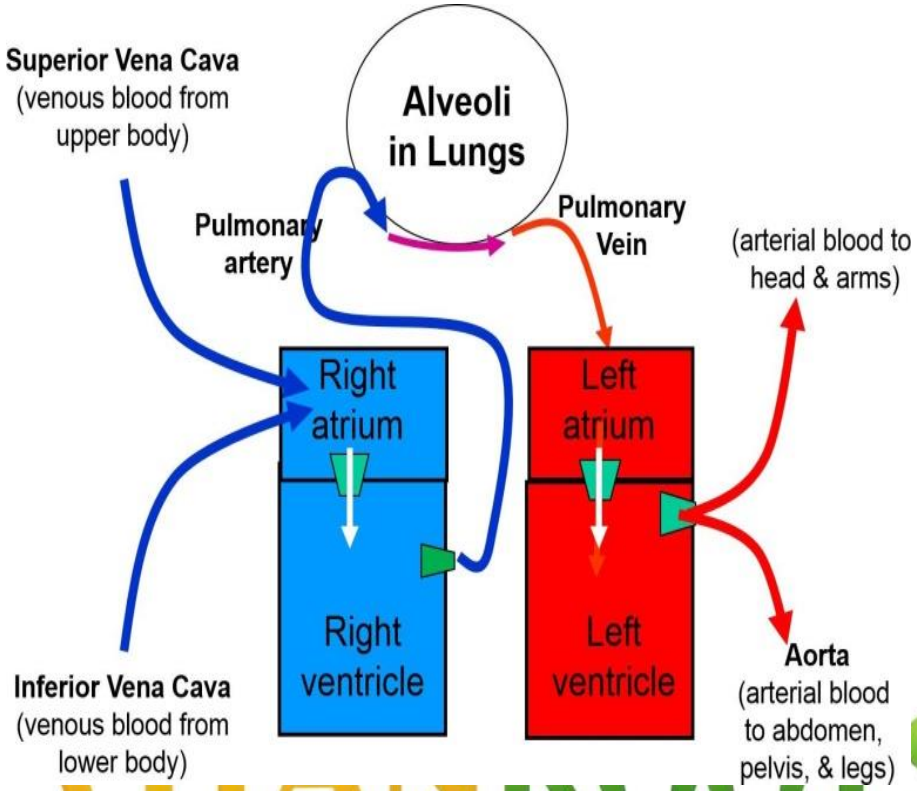
in which all the chambers of the heart contract and relax once is called cardiac cycle. The heart beats about 72 times per minute in a normal adult. In one cardiac cycle, the heart pumps out 70 mL blood and thus about 4900 mL blood in a minute. Double circulation ensures completes egregation of oxygenated and deoxygenated blood which is necessary for optimum energy production in warm-blooded animals.



Internal structure of heart

Circulation of Blood through the heart:

SystemicVein→SinusVenosus→RightAuricle→RightVentricle→PulmonaryArtery→ Lungs→PulmonaryVein→LeftAuricle→LeftVentricle→TrunchusArteriosus→Systemic Circulation



TRANSPORTATIONINPLANTS

Plants have specialized vascular tissues for transportation of substances. There are two types of vascular tissues in plants, viz. xylemand phloem.

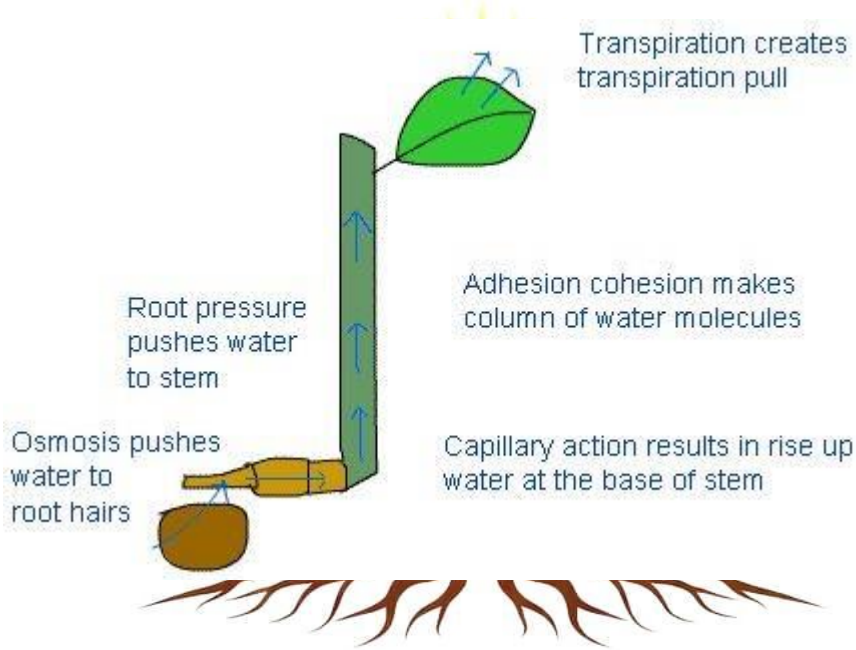
Xylem: Xylem is responsible for transportation of water and minerals. It is composed of trachieds, xylem vessels, xylem parenchyma and xylem fibre. Trachieds and xylemvessels are the conducting elements. The xylem makes a continuous tube in plants which runs from rootsto stem and right up to the veins of leaves.

Phloem: Phloem is responsible for transportation of food. Phloem is composed of sieve

tubes, companion cells, phloem parenchyma and bast fibres. Sieve tubes are the conducting elements in phloem.

Ascent of Sap

The upward movement of water and minerals from roots to different plant parts is called ascent of sap. Many factors are at play in ascent of sap and it takes place in many steps. They are explained as follows:



Root Pressure: The walls of cells of root hairs are very thin. Water; from soil; enters the root hairs because of osmosis. Root pressure is responsible for movement of water up to the base of the stem.

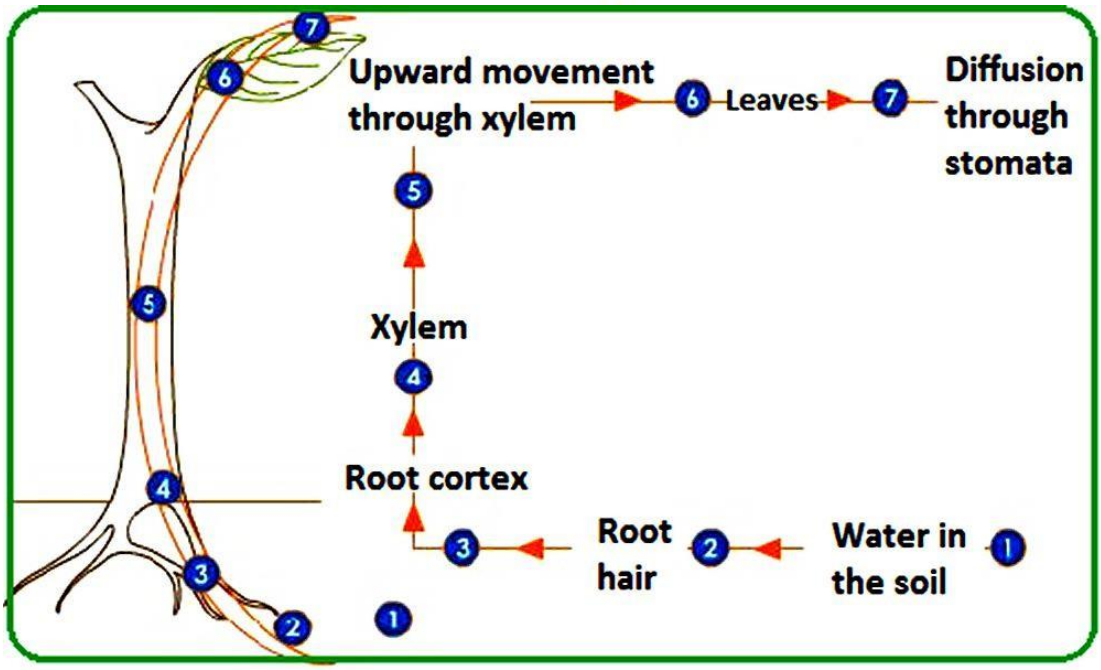
Capillary Action: A very fine tube is called capillary. Water; or any liquid; rises in the capillary because of physical forces and this phenomenon is called capillary action. Water; in stem; rises up to some height because of capillary action.

Adhesion-cohesion of Water Molecules: Water molecules make a continuous column in the xylem because of forces of adhesion and cohesion among the molecules.

Transpiration Pull: Loss of water vapour through stomata and lenticels; in plants; is called transpiration. Transpiration through stomata creates vacuum which creates a suction; called transpiration pull. The transpiration pull sucks the water column from the

xylem tubes and thus water is able to rise to great heights in even the tallest plants.

Transport of Food: Transport of food in plants happens because of utilization of energy. Thus, unlike the transport through xylem; it is a form of active transport. Moreover, the flow of substances through phloem takes place in both directions, i.e. it is a two-way traffic in phloem.



Question 1: What are the components of the transport system in human beings? What are the functions of these components?

Answer: The main components of the transport system in human beings are the heart, blood, and blood vessels.

Heart pumps oxygenated blood throughout the body. It receives deoxygenated blood from the various body parts and sends this impure blood to the lungs for oxygenation.

Being a fluid connective tissue, blood helps in the transport of oxygen, nutrients, CO_2, and nitrogenous wastes.

The blood vessels (arteries, veins, and capillaries) carry blood either away from the heart to various organs or from various organs back to the heart.

Question 2: Why is it necessary to separate oxygenated and deoxygenated blood in mammals and birds?

Answer : Warm-blooded animals such as birds and mammals maintain a constant body temperature by cooling themselves when they are in a hotter environment and by warming their bodies when they are in a cooler environment. Hence, these animals require more oxygen (O2) for more cellular respiration so that they can produce more energy to maintain their body temperature.

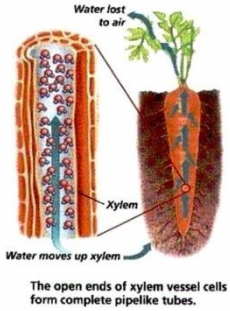
Thus, it is necessary for them to separate oxygenated and de-oxygenated blood, so that their circulatory system is more efficient and can maintain their constant body temperature.

Question 3: What is the components ofthe transport system in highly organised plants?

Answer : In highly organised plants, there are two different types of conducting tissues − xylem and phloem. Xylem conducts water and minerals obtained from the soil (via roots) tothe rest of the plant. Phloem transports food materials from the leaves to different parts of the plant body.

Question4: How are water and minerals transported in plants?

Answer: The components of xylem tissue (tracheids and vessels) of roots, stems, and leaves are interconnected to form a continuous system of water-conducting channels that

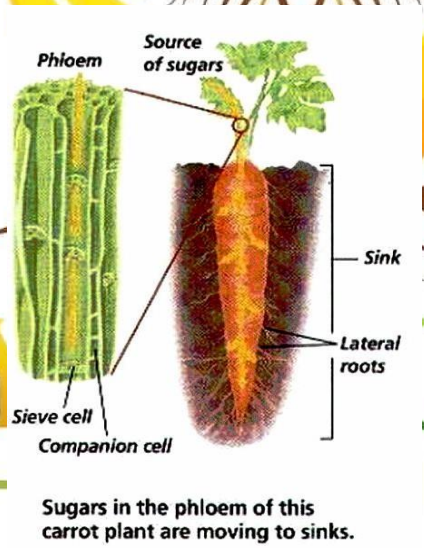


The open ends of xylem vessel cells form complete pipelike tubes.

reaches all parts of the plant. Transpiration creates a suction pressure, as a result of which water is forced into the xylem cells of the roots. Then there is a steady movement of water from the root xylem to all the plant parts through the interconnected water-conducting channels.

Question5: How is food transported in plants?

Answer : Phloem transports food materials from the leaves to different parts of the plant body. The transportation of food in phloem is achieved by utilizing energy from ATP. As a result of this, the osmotic pressure in the tissue increases causing water to move into it. This pressure moves the material in the phloem to the tissues which have less pressure. This is helpful in moving materials according to the needs of the plant. For example, the food material, such as sucrose, is transported into the phloem tissue using ATP energy.



EXCRETION

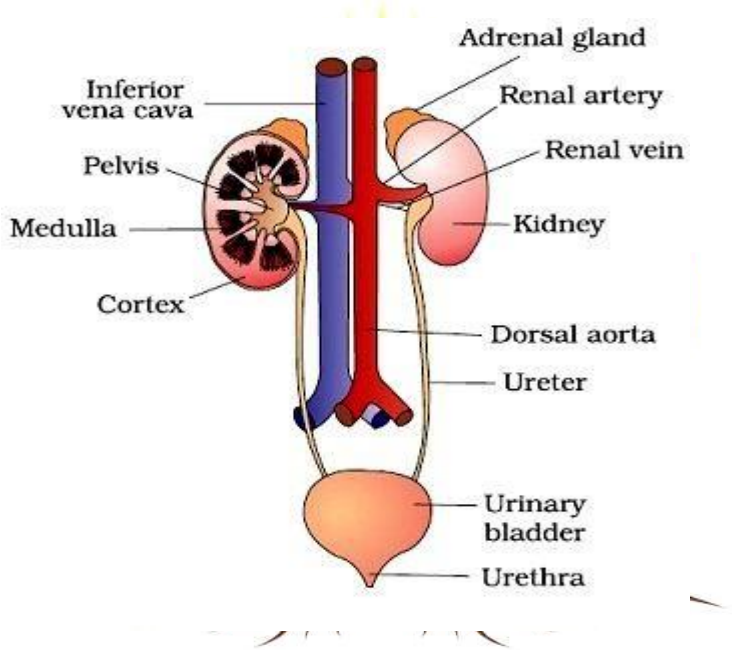
Removal of harmful waste from the body is called excretion. Many wastes are produced during various metabolic activities. These need to be removed in time because their accumulation in the body can be harmful and even lethal for an organism.

HUMANEXCRETORY SYSTEM

The human excretory system is composed of a pair of kidneys. Atube; called ureter;comesout of each kidney and goes to the urinary bladder. Urine is collected in the urinary bladder, from where it is expelled out through urethra as and when required.

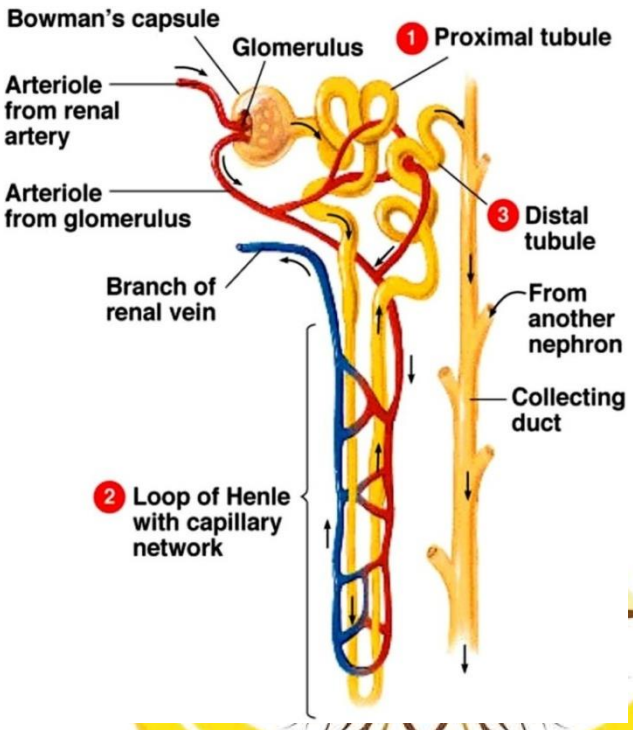
Kidney: Kidney is a bean-shaped organ which lies near the vertebral column in the abdominal cavity. The kidney is composed of many

Filtering units; called nephrons.Nephron is called the functional unit of kidney.



Nephron: It is composed of a tangled mess of tubes and a filtering part; called glomerulus. Glomerulus is a network of blood capillaries to which renal artery is attached. The artery which takes blood to the glomerulus is called afferent arteriole and the one receiving blood from the glomerulus is called efferent arteriole. Glomerulus is enclosed in a capsule like portion; called Bowman's capsule. The Bowman's capsule extends into a fine tube which is highly coiled. Tubes from various nephrons converge into collecting duct; which finally goes to the ureter.

Filtration in Glomerulus: Filtration happens because of very high pressure inside the glomerulus. The lumen of efferent arteriole is smaller than that of afferent arteriole. Due to this, the blood entering the glomerulus experiences very high pressure and due to this, the waste products are filtered out through the thin membrane of capillaries in the glomerulus.



The filtered blood is sent to the systemic circulation through efferent arteriole and the filtrate goes to the Bowman's capsule. That is how urine is formed inside the kidneys. Re absorption of water and some other filtrates takes place in the tubular part of the nephron. This increases the concentration of urine. The human urine is mainly composed of water and urea.

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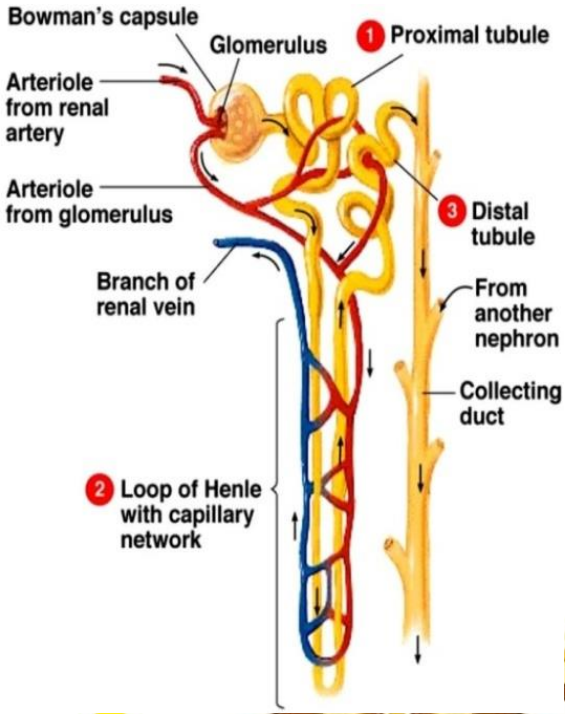

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EXCRETION IN PLANTS

Plants have no special organs for removal of wastes. The waste products of respiration and photosynthesis are used as raw materials for each other. Oxygen gas produced as a by-product of photosynthesis is used up during respiration and carbon dioxide produced during respiration is used up during photosynthesis.

Excretion is carried out in the plants in the following ways:

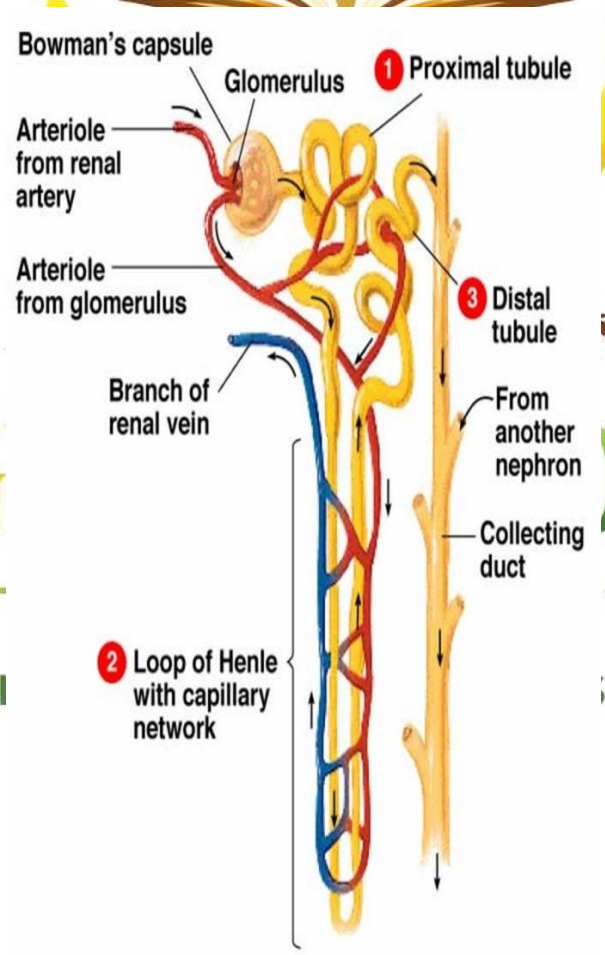
i. The gaseous wastes, oxygen, carbondioxide and watervapour are removed through stomata of leaves and lenticels of stems.
ii. Some waste products collect in the leaves and bark of trees. When the leaves and bark

are shed, the wastes are eliminated.

iii. Some waste products are rendered harmless and then stored in the plant body as solidbodies. Raphides, tannins, resins, gum, rubber and essential oils are some such wastes.

Question1:Describe the structure and functioning of nephrons.

Answer : Nephrons are the basic filtering units of kidneys. Each kidney possesses largenumber of nephrons, approximately 1-1.5 million. The main components of the nephron are glomerulus, Bowman's capsule, and a long renal tubule.



Functioning of an ephron:

The blood enters the kidney through the renalartery,which branches into many capillaries associated with glomerulus.

The water and solute are transferredo the nephron at Bowman'scapsule.

In the proximal tubule, some substances such as amino acids, glucose, and salts are selectively reabsorbed and unwanted molecules are added in the urine.

The filtrate then moves down into the loop of Henle, where more water is absorbed.

From here, the filtrate moves upwards into the distal tubule and finally to the collecting duct. Collecting duct collects urine from many nephrons.The urine formed in each kidney enters along tube called ureter. From ureter,it gets transported to the urinary bladder and then into the urethra.

Question 2: What are the methods used by plants to get rid of excretory products?

Answer : Plants can get rid of excess of water by transpiration. Waste materials maybe stored in the cell vacuoles or as gum and resin, especially in old xylem. It is also stored in the leaves that later fall off.

Question3:How is the amount of urine produced regulated?

Answer : The amount of urine produced depends on the amount of excess water and dissolved wastes present in the body. Some other factors such as habitat of an organism and hormone such as Anti-diuretic hormone (ADH) also regulates the amount of urine produced.

Question1:The kidneys in human beings are a part of the system for

a) nutrition.
b) respiration.
c) excretion.
d) transportation**.**

Answer: (c)In human beings, the kidneys are a part of the system for excretion.

Question2:Thexyleminplantsareresponsiblefor

a) transport of water.
b) Transport of food.
c) Transport of aminoacids.
d) Transport of oxygen.

Answer :(a) In a plant, the xylem is responsible for transport of water.

Question3:The autotrophic mode of nutritionr equires

a) Carbondioxide and water.
b) chlorophyll.
c) sunlight.
d) all of theabove.

Answer:(d)The autotrophic mode of nutrition requires carbondioxide,water,chlorophyll and sunlight.

Question 4:The breakdown of pyruvate to give carbon dioxide, water and energy takes place in

a) cytoplasm.
b) mitochondria.
c) chloroplast.
d) nucleus.

Answer : (b) The breakdown ofpyruvate to give carbon dioxide, water and energytakes place in mitochondria.

Question 5:How are fats digested in our bodies? Where does this process take place?

Answer: Fats are present in the form of large globules in the small intestine. The small intestine gets the secretions in the form of bile juice and pancreatic juice respectively from the liver and the pancreas. The bile salts(from the liver)break down the large fat globules

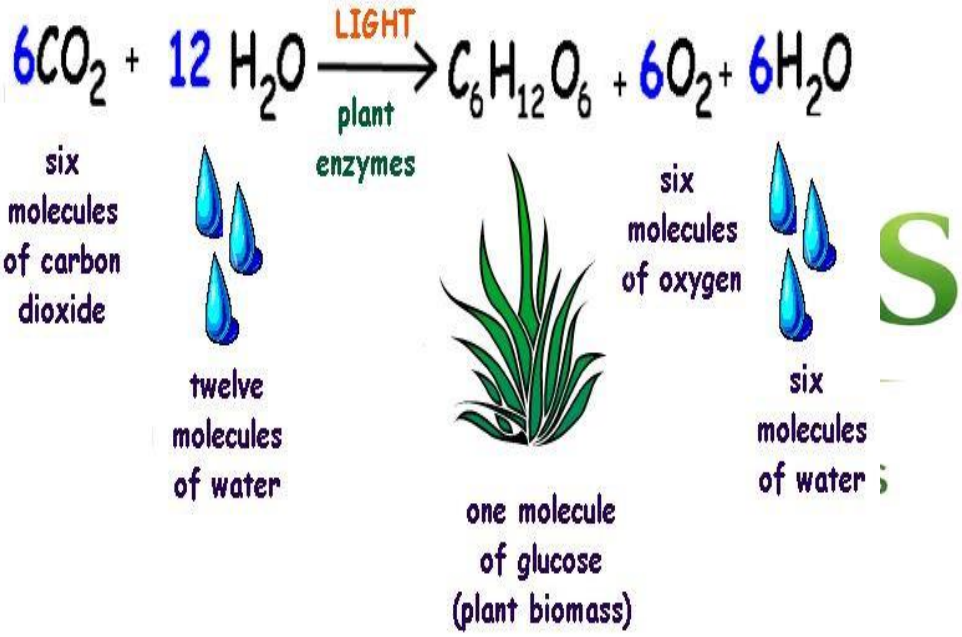
into smaller globules so that the pancreatic enzymes can easily action them. This is referred to as emulsification of fats. It takes place in the small intestine.

Question6:What is the role of saliva in the digestion of food?

Answer : Saliva is secreted by the salivary glands, located under the tongue. It moistens the food for easys wallowing. It contains a digestive enzyme called salivary amylase, which breaks down starch into sugar.

Question 7: What are the necessary conditions for autotrophic nutrition and what are its by-products?

Answer : Autotrophic nutrition takes place through the process of photosynthesis. Carbon dioxide, water, chlorophyll pigment, and sunlight are the necessary conditions required for autotrophic nutrition. Carbohydrates (food) and O2 are the by-products of photosynthesis.



Question8: What are the differences between aerobic and anaerobic respiration? Name some organisms that use the anaerobic mode of respiration.

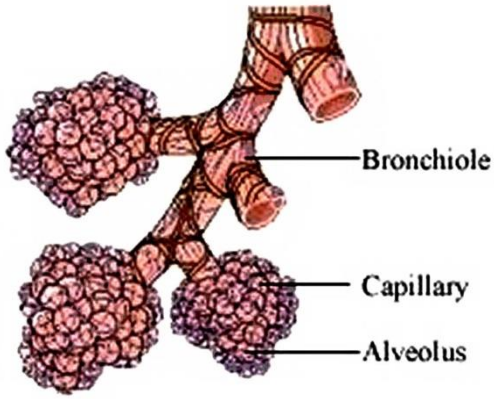
Answer:

Aerobic respiration	An aerobic respiration
1.It occurs in the presence of O2.	**1.**It occurs in the absence of O2.
2.It involves the exchange of gases Between the organ is mand the outside environment.	**2.**Exchange of gases is absent.
3.It occurs in cytoplasm and mitochondria.	**3 .**It occurs only in cytoplasm.
4.It always releases CO2 and H2O.	**4.**End products vary.
5.It yields 36 ATPs.	**5.**It yields only2ATPs.

An aerobic respiration occurs in the roots of some water logged plants, some parasitic worms, animal muscles, and some micro-organisms such as yeasts.

Question9:How are the alveoli designed to maximize the exchange of gases?

Answer: The alveoli are the small balloon-like structures present in the lungs. The walls of the alveoli consist of extensive network of blood vessels. Each lung contains 300−350 million alveoli, making it a total of approximately 700 million in both the lungs. The alveolar surface when spread out covers about 80 m2 area. This large surface area makes the gaseous exchange more efficient.



Question 10: What would be the consequences of adeficiency of haemoglobin in our bodies?

Answer : Haemoglobin is the respiratory pigment that transports oxygen to the body cells for cellular respiration. Therefore, deficiency of haemoglobin in blood can affect the oxygen supplying capacity of blood. This can lead to deficiency of oxygenin the body cells. It can also lead to a disease called anaemia.

Question 11:Describe double circulation in human beings. Why is it necessary?

Answer: The human heart is divided into four chambers−the right atrium,the right ventricle, the left atrium, and the left ventricle.

Flow of blood in the heart:

The heart has superior and inferior vena cava, which carries de-oxygenated blood from the upper and lower regions of the body respectively and supplies this de- oxygenated blood to the right atrium of the heart.

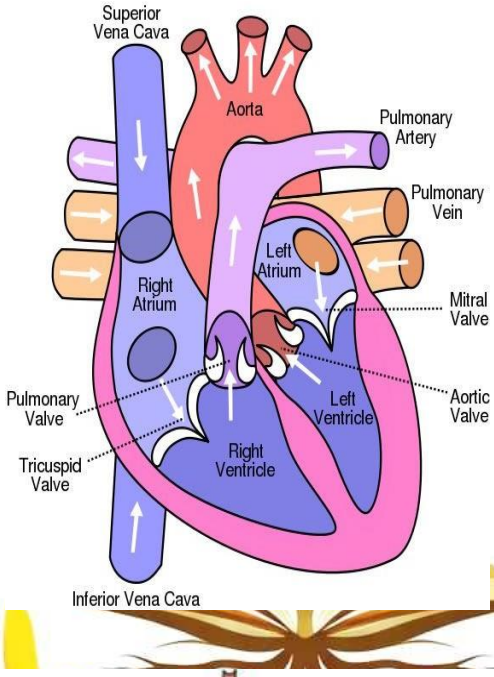
The right atrium then contracts and passes the de-oxygenated blood to the right ventricle, through an auriculo-ventricular aperture.

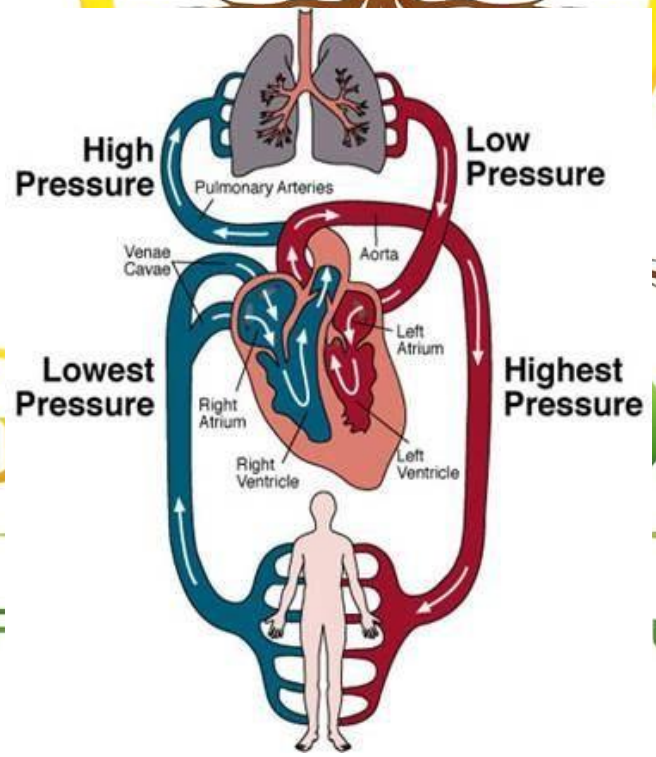
Then the right ventricle contracts and passes the de-oxygenated blood into the two pulmonary arteries, which pumps it to the lungs where the blood becomes oxygenated.

From the lungs, the pulmonary veins transport the oxygenated blood to the left atrium of the heart.

Then the left atrium contracts and through the auriculo-ventricularaperture,the oxygenated blood enters the left ventricle.

The blood passes to aortafromthe left ventricle. The aortagivesrise to many arteries that





distribute the oxygenated blood to all the regions of the body.

Therefore, the blood goes twice through the heart. This is known as double circulation.

Importance of double circulation:

The separation of oxygenated and de-oxygenated blood allows a more efficient supply of oxygen to the body cells. This efficient system of oxygen supply is very useful in warm-blooded animals such as human beings.

As we know, warm-blooded animals have to maintain a constant body temperature by cooling themselves when they are in a hotter environment and by warming their bodies when they are in a cooler environment. Hence, they require more O2 for more respiration so that they can produce more energy to maintain their body temperature. Thus, the circulatory system of humans is more efficient because of the double circulatory heart.

Question12: What are the differences between the transport of materials in xylem and phloem?

Answer:

Transport of materials in xylem	**Transport of materials in phloem**
1.Xylemt is use helps in the transport of Water and minerals.	**1.**Phloemt is use helps in the transport of food.
2.Wateristransportedupwardsfrom Roots to all other plant parts.	**2.**Food is transported in both up ward And down ward directions.
3.Transport in xylem occurs with the Help of simple physical forces such as transpiration pull.	**3.** Transport of food in phloem requires energy in the form of ATP.

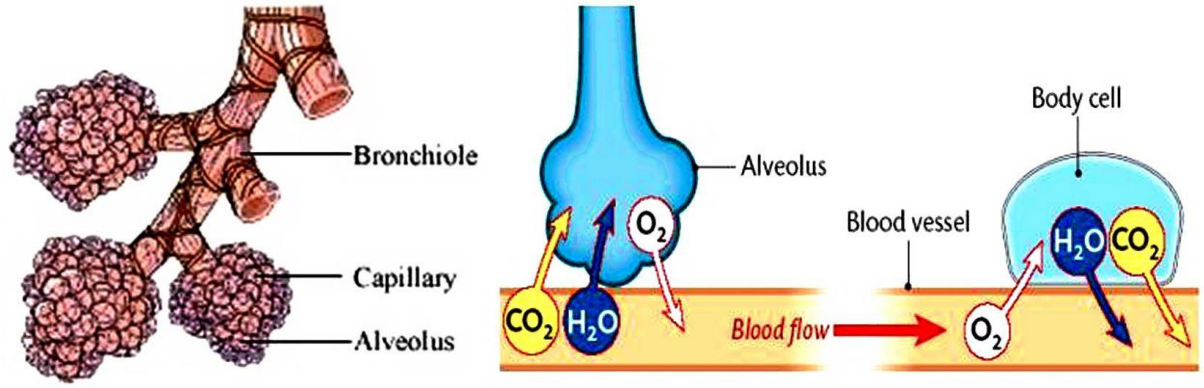
Question 13: Compare the functioning of alveoli in the lungs and nephrons in the kidneys with respect to their structure and functioning.

Answer: ***ALVEOLI***

Structure

Alveoli are tiny balloon-like structures present inside the lungs.

(i) The walls of the alveoli are one cell thick and it contains an extensive network of blood capillaries.



Function

(i) The exchange of O2 and CO2 takes place between the blood of the capillaries that surround the alveoli and the gases present in the alveoli.

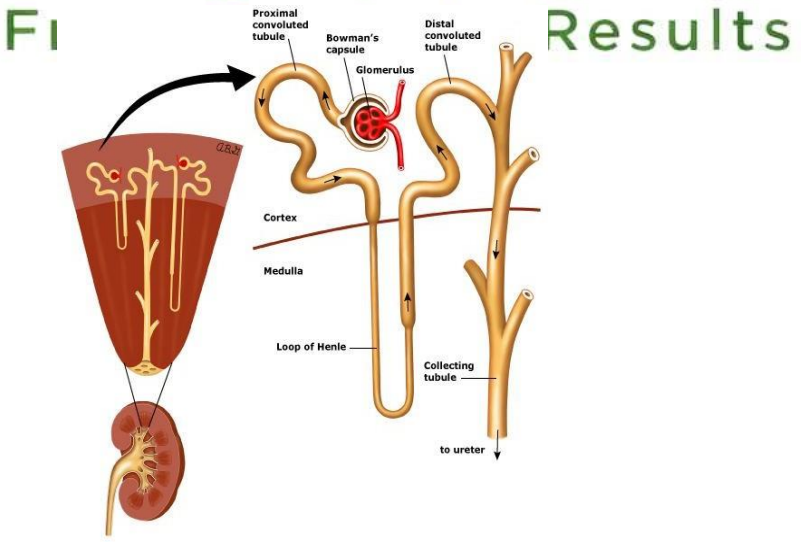
ii) Alveoli are the site of gaseous exchange.

NEPHRON

Structure

Nephrons are tubular structures present inside the kidneys.

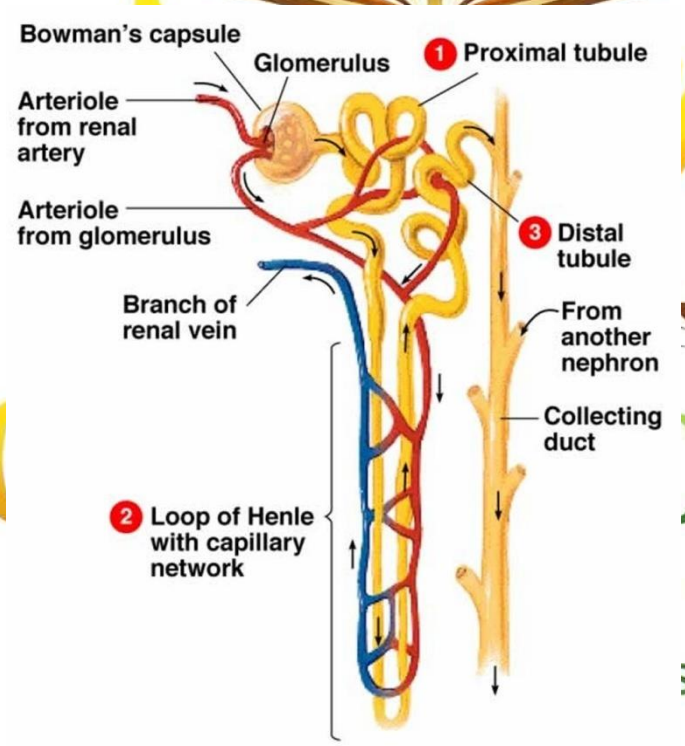
(i) Nephrons are made of glomerulus, bowman's capsule, and alongrenaltube.It also contains a cluster of thin-walled capillaries.



Function

(i) The blood enters the kidneys through the renal artery which branches into many capillaries in the glomerulus. The water and solute are transferred to the nephron at Bowman's capsule. Then the filtrate moves through the proximal tubule and then down into the loop of henle.From henle's loop, filtrate passes into the distal tubule and then to the collecting duct. The collecting duct collects the urine from many nephrons and passes it to the ureter. During the flow of filtrate, some substances such as glucose, amino acids, and water are selectively re- absorbed.

Nephrons are the basic filtration unit.



ASSIGNMENT QUESTIONS SET–1

LIFE PROCESSES

1. Define nutrition? What are the different modes of nutrition?
2. What is the mode of nutrition in fungi?
3. Name the pigment, which can absorb solar energy.
4. Name the two stages in photosynthesis.
5. Name the factors ,which affect photosynthesis.
6. Define a herbivore and a carnivore.
7. What is compensation point?
8. Other than chlorophyll, which other pigment is necessary for photosynthesis?
9. Where does digestion begin?
10. What is the name given to the process of using the absorbed food for producingenergy?
11. What happens to visible light of the Sun when it falls on chlorophyll?
12. Name the product and by product of photosynthesis.
13. In which bio chemical form the photosynthetic moves in phloemtissue?
14. What are the raw materials of photosynthesis?
15. What is the similarity between chlorophyll and hemoglobin?
16. Name the products of photolysis is of water.
17. What are the end products of light dependant reaction?
18. Which cellorganelle is the site of photosynthesis?
19. What is the difference between digestion of heterotrophs and saprotrophs?
20. Give example of two plants and two animal parasites.
21. Name the en zymepresent in saliva, what is its role indigestion?
22. Which chemical is used to test for starch? Which colour shows the presence of starch?
23. How does amoebaen gulf its food?
24. Name the parts of the digestive system of a grass hopper.

25. What are the functions of the liver and the pancreas?

26. Define breathing.

27. How is respiration different from breathing?

28. In which kind of respiration is moreenergy released?

29. Which part of the roots is involved inexchange of respiratory gases?

30. What are (i) stomataand (ii)lenticels?

31. Give two points of differences between respiration in plants and respiration in animals.

32. Name the respiratory organs of

i. fish

ii. mosquito

iii. earthworm

iv. dog

33. From where do the following take in oxygen? (i)prawn (ii)rat.

34. State the function of epiglottis.

35. Define photolysis.

36. What are the living organisms that cannot make their own food called?

37. What are chemotrophs?

38. Give the term-rhythmic contraction of alimentary can almuscle to propelfood.

39. Name the three secretion so fgastricglands.

40. What is the function of mucus in gas triegland?

41. Name the sphincter which regulates the exit of food from the stomach.

42. Give the functions of hydrochloric acid for the body.

43. What is the role of pepsinin stomach?

44. Why pancreas is called mixedgland?

45. Give two functions of bilejuice, from which organ it is released?

46. Name the largest gland of our body.

47. Name any three important enzymes of pancreas and the food component on which they act.
48. Where from intestinal juice come to the small intestine?
49. What is the function of intestinal juice?
50. What are the simplest digestive product of carbohydrate, fats and protein?
51. Name the finger like projections of small intestine and what is the necessity of such type of projections in .
52. What is the function of analsphincter?
53. Name the site of anaerobic and aerobicre spiration in a cell.
54. A three carbon compound is the common product of both aerobic and anaerobic pathway. What is that?
55. Why do we get muscle cramp afte rvigorous exercise?
56. Distinguish between lactic acid and alcoholic fermentation?
57. Name the energy currency molecule of cell?
58. The breathing rate of aquatic animals is high, why?
59. What is the function of mucus and fine hair in nostrils?
60. Give the function of network of capillaries on alveoli.
61. Name the main carrier of oxygen and carbondioxide in man.
62. Why does haemoglob in molecule act as efficient carrier of oxygen than diffusion process?
63. Give example of any three substances transported by plasma.
64. Name the organ that-(a)pushes blood around body(b)make blood to reach to tissues.
65. Name the blood vessel that carries blood from hear to lungs and from lungs to heart.
66. How many heart chambers are there in (a)fish (b)frog (c)lizard (d)crocodile (e)birds (f) man?
67. Name the device that measures blood pressure.
68. What is the normal blood pressure of man?
69. Why capillaries are thin walled?
70. Which cell of blood help in wound healing?

71. What is the other name of lymph?

72. Give two function of lymph.

73. What is the direction of flow of water in xylem and food in phloem?

74. Why do plants need less energy than animals?

75. Which process acts as suction to pull water from xylem cells of roots.

76. Mention two functions of transpiration.

77. What are the two substances transported through phloemtissue?

78. Name the food component whose digestion produce nitrogenous waste?

79. Which is the functional unit of kidney?

80. What is the cup shaped structure of nephron called?

81. Which materials are selectively reabsorbed by nephrontubule?

82. What are the two important functions of kidney.

83. What is the other name of artificial kidney?

84. A key molecule NOT found inachloroplast is

i. Chlorophyll
ii. Carbondioxide
iii. Water
iv. Steroids

85. Photosynthesis is a good example of

i. Catabolism
ii. Anabolism

86. Chloroplasts are found in heterotrophic cells.

i. True
ii. False

87. Which of these choices is NOT in the structure of a chloroplast?

i. Granum
ii. Stroma

iii. Cristae

iv. Thylakoid

88.Onlyplant scan conduct photosynthes is with chloroplasts.

i. True

ii. False

89. Chloroplasts convert solarenergy into physicalenergy.

i. True

ii. False

90.What are nutrients?

91 Name the life process that provides energy.Which process provides allliving things with raw materials for energy and growth?

92.Name the essential pigment that absorbs light.

93.Can you name the gaseous raw material of photosynthesis?

94. If granaofa chloroplast are removed then,which of there action of will not be carried out?

95 Name the gas that is produced as a by-productduring photosynthesis.

96 Tick the correct statement.

i. Arteriescarrybloodawayfromtheheartwhileveinscarrybloodtowardsheart.

ii. Veinscarrybloodawayfromtheheartwhilearteriescarrybloodtowardsheart.

iii. Both of them carry blood in the same direction.

iv. Either of them can carry blood away from the blood.

97 Artificial removal of nitrogenous wastes from the human body in the event of kidney failure is

i. Plasmolysis

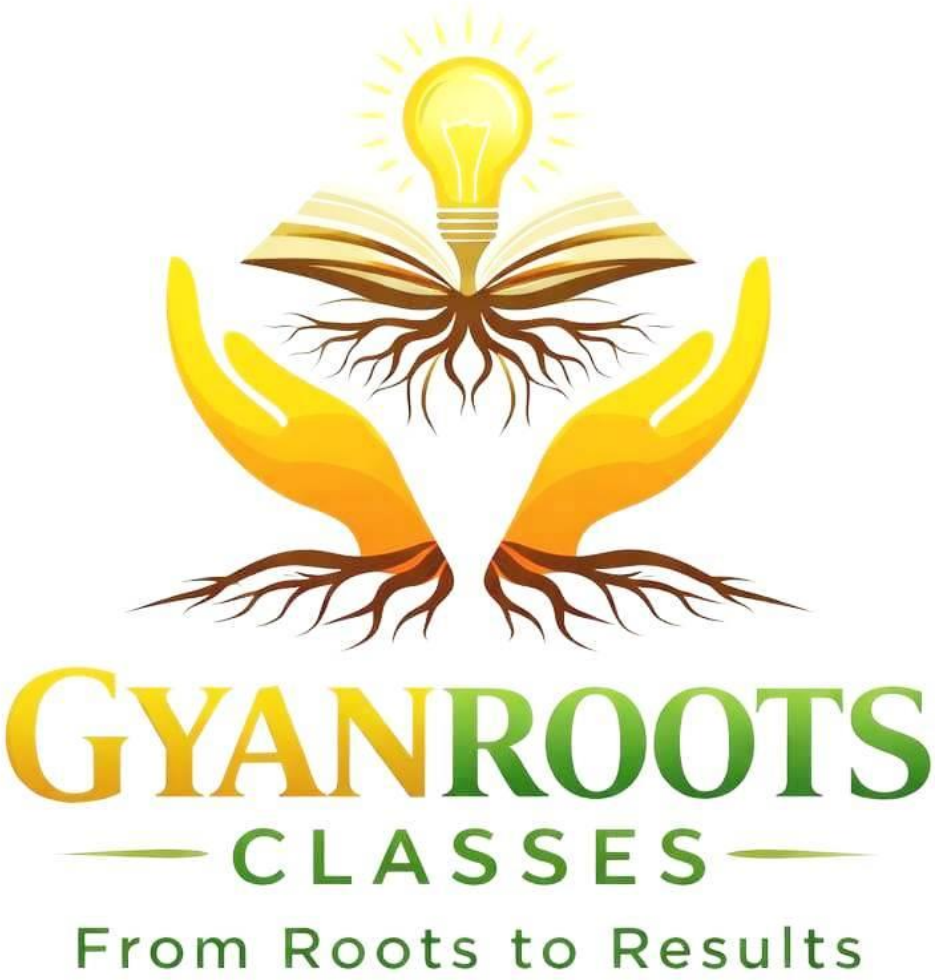
ii. Dialysis

iii. Diffusion

iv. Osmosis

98 The function of salivary amylase is to convert

i. Fats into fatty acids.
ii. Proteins into aminoacids.
iii. Starchinto sugar.
iv. Sugar into starch

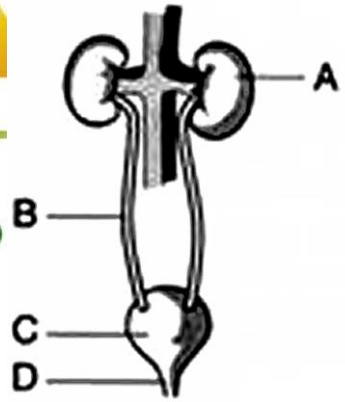


ASSIGNMENT QUESTIONSSET–2

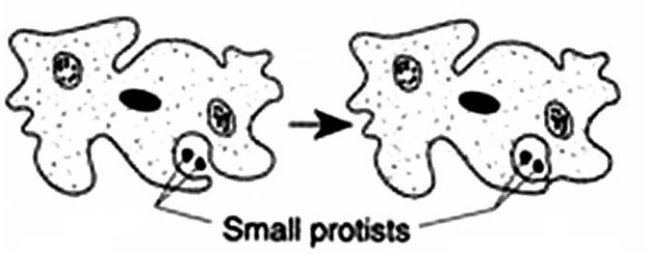
CHAPTER – 6

LIFE PROCESSES

1. Name the pore through which gaseous exchange takes place in olderstems.
2. Why the blood is red?
3. What is the functional unit of kidney?
4. Define translocation.
5. Name the vessel that brings oxygenatedblood from lungs to heart.
6. Why the colour of lymph is yellow?
7. Name the reagent which is used to test the presence of starch.
8. Why walls of articles are thinner than ventricles?
9. The mode of nutrition in which digestive enzymes are secreted outside the body.
10. What is ATP?
11. The diagram below represents urinary system in the human body. Identify the structure through which urine leaves the urinary bladder.



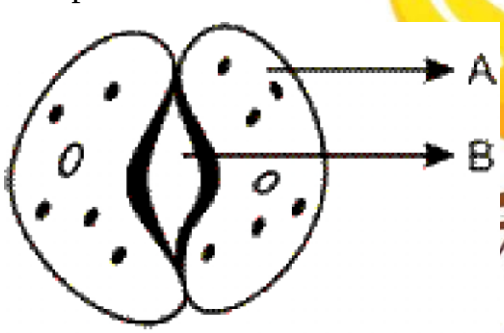
12. Which activity is illustrated in the diagram of an Amoeba shown below?



13. Why is the rate of breathing interres trial animals slower than aquatic animals?

14. student covered a leaf from a destarched plant with a black papers trip and kept it in the garden outside his house in fresh air. In the evening, he tested the covered portion of the leaf for presence of starch. What the student was trying to show? Comment.

15. The parts shown as A and B in the given diagram are



The parts shown as A and B in the given diagram are

A) A is epidermal cell, Bisstomatal pore

B) A is guardcell, Bisstomatalpore

C) A is epidermalcell, Bisguard cell

D) A isguardcells, Bisepiderma lcell

16. The kidneys in human beings are apart of the system for

(a) nutrition.

(b) respiration.

(c) excretion.

(d) transportation.

17. The xylem in plants are responsible for

(a) Transport of water.

(b) Transport of food.

(c) Transport of aminoacids.

(d) Transport of oxygen.

18. The autotrophic mode of nutrition requires

(a) Carbondioxide and water.

(b) chlorophyll.

(c) sunlight.

(d) All of the above.

19. The breakdown of pyruvate to give carbondioxide,water and energy takes placein

(a) cytoplasm.

(b) mitochondria.

(c) chloroplast.

(d) nucleus.

20. Movement of food through oesophagus is dueto

(a) Lubrication bys aliva

(b) Peristalsis

(c) Gravitational Pull

(d) All of the above

21. Where is bile produced?

(a)Gallbladder (b)Blood

(c)Liver (d)Spleen

22. In normal expiration, the diaphragmis

(a) Arched

(b) Flattened

(c) Perforated

(d) None of these

23. The correct path way of blood incirculatory system is

(a) atria→ventricles→arteries→veins

(b) ventricles→atria→veins→arteries

(c) ventricles→veins→arteries→atria

(d) veins→ventricles→atria→arteries

24. Respiration is a process in which

(a) Energy is stored in the form of ADP

(b) Energy is released and stored in the form of ATP

(c) Energy is used up

(d) Energy is not released at all.

25. In Photosynthetic process, atmospheric carbondioxide is to carbohydrates

a) oxidised

b) Reduced

c) Neutralised

d) Burnt

26. When water enters the guardcells the stomata

a) Opens

b) Closes

c) Open orcloses

d) No effect

27. Wastes concentrated in the tubules of Bowman's capsule are called .

(a) salts.

(b) juices

(c) urine

(d) aminoacids

28. On seeing good food our mouth waters. This fluid is actually

a) Water

b) Hormone

c) Enzyme

d) None of the above

29. The enzyme Pepsin is inactive in stomach without the presence of

a) Nitric Acid

b) Hydrochloric acid

c) Acetic acid

d) Butyric acid

30. Villi present on the inner lining of the intestinal wall

a) Secrete senzymes for digestion

b) Secrete shormones

c) Decreases the surface area for absorption

d) Increases the surfacearea for absorption

31. During cellular respiration one molecule of glucose is first broken down into two molecules of _____

a) Acetic acid

b) Pyruvic acid

c) Lactic acid

d) None of the above

32. Rajib was absent in the class because of muscle pain which he claims to be due to excess physical exercise he had done yesterday. This pain is due to

a) Formation of lactic acid

b) Formation of acetic acid

c) Formation of Pyruvic acid

d) Formation of Hydrochloric acid

33. Right part of the human heart contains

a) Oxygenated blood

b) Mixed blood

c) Deoxygenated blood

d) No blood

34. The transport of soluble products of photosynthesis is called translocation and it occurs in the part of the vascular tissue called

a) Xylem

b) Sclerenchyma

c) Phloem

d) Collenchyma

35. In human each kidney has large numbers of filtration units called _____

a) Neutrons

b) Neurons

c) Neptune

d) Nephrons

36. Haemoglobin is a type of

(a) Carbohydrate

(b) SkinPigment

(c) Vitamin

(d) Respiratory Pigment

37. If kidney fail store absorb water, the tissues would

(a) Remain unaffected

(b) Shrink to shrivel

(c) Absorb water from blood

(d) Take more oxygen from blood

38. Name an organ which is part of two body systems.

39. Why do raw bread taste sweet eronmastication?

40. How are fats digested in our bodies? Where does this process take place?

41. What is the role of saliva in the digestion of food?

42. Why will simple diffusion not meet the requirement of humanbeings?

43. What criteria do we use to decide whether something is alive?

44. After long running, you may experience cramps in your leg muscles.Whats the reason behind this?

45. What processes would you consider essential formaintaining life?

46. How do villi enhance absorption of food in the intestine?

47. Why bile juice is consider edimportant even though it does not contain any digestive enzymes?

48. Which organs secrete the following enzymes:

(i) Trypsin

(ii) Pepsin

49. Namethefactorsthataffectphotosynthesis.

50. Namethevestigealpartofhumanalimentarycanal?

51. Whatisthenamegiventorhythmicwavelikemanneroccurringinalimentarycanal?

52. Thebarkofwoodyplantsisdeadbuttheinnerlayersinsidethebarkareliving.Howdo they get oxygen and release carbon dioxide?

53. Whatarelenticels?

54. Howdoesphotosynthesisoccur?

55. Namethemodeofnutritioninanorganismthatusessimplesubstances likeCO2and water to

prepare food inside its body?

56. Whatarethedifferencesbetweenautotrophicnutritionandheterotrophicnutrition?

57. ReadfollowingstatementsfromAtoEandidentifytherelevantlifeprocessfromthe following word list.

growth,transport,synthesis,regulation,nutrition

A. A butterfly sucking the nectar from the flowers in a garden.

B. Aboyshoutswithexcitementwhenhisschoolteamwinsthematchonthelastball.

C. Afterfinishinglunch,Mohan'sblooddistributesthefoodmoleculestodifferentcells of his body.

D. Green plants prepares starch(complex substance)from simpler chemicals.

E. Radhafindsherheighthasincreasedby4cmsinceherlastbirthday.

58. What is osmo regulation?

59. What are the different ways in which glucose is oxidized to provide energy in various organisms?

60. Which organ of the plant body helps in osmo-regulation?

61. Which organelle of the cell in animals helps in osmo-regulation?

62. How does transpiration pull help in ascent of sap?

63. In what for mexcretion takes place in plants?

64. What are the component soft he transport system in highly organized plants?

65. What is meant by double circulation? Mention its advantages.

66. Who has longer small intestine tiger or cow?

67. Leaves of a healthy potted plant are coated with Vaseline to block the stomata. Will this plant remain healthy for long? State three reasons to support your answer.

68. Outline inhalation-exhalation cycle.

69. What are the component soft he transport system in human beings? What are the functions of these components?

70. Whyisitnecessarytoseparateoxygenatedanddeoxygenatedbloodinmammalsand birds?

71. Why is there extra air in our lungs after exhaling?

72. Which cell are the site of exchange of gases?

73. How are the lungs designed in human beings to maximize the area for exchange of gases?

74. Why blood is necessary for oxygen delivery to all parts of the body in larger animals?

75. Define home ostasis.

76. Name the organ systems tha thelpus maintain homeostasis.

77. What in kidneys is analogous to alveloliinlungs?

78. State the role and function of lymphin humantransport system.

79. What is the basic reason of urine production?

80. State the role of kidneys in human transport system.

81. Who discovered systemic blood circulation system in human body?

82. What is pulmonary circulation and system circulation?

83. Which fluid is also know as tissue fluid?

84. What is sphygmom anometer?

85. What is the function of ureter?

86. Assertion and ReasonType

Assertion: Bile is essential for fat digestion

Reason: Fats cannot be digested without emulsification Use the following Key to choose the appropriate answer.

(a) Both Assertion & Reason are True &Reason is a correct explanation of the Assertion.

(b) If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion.

(c) If Assertion is True but the Reason is False.

(d) If both Assertion and Reason are False

87. Chyme is ___.

(a) Digestive enzyme secreted by stomach.

(b) Hormone secreted by islets of Pancreas

(c) Food which enters into intestine from stomach.

(d) Part of bile juice which storesing all bladder.

88. What is the nature of Chyme? Acidic or Basic or Neutral?

89. During day time transpiration and photosynthesis are interlinked. What do you mean by this statement?

90. 'Sweating in animals' is equivalent to what in plants?

91. What factor contributes to rate of transpiration?

92. How does transpiration help plants?

93. Name the mineral required for healthy growth of teeth.

94. Name the chemical used to detect presence of starch.

95. What is the function of mucus secreted in stomach during digestion?

96. What is the optimum temperature for photosynthesis?

97. Differentiate between Blood and Lymph.

98. How does diaphragm help ininhalation?

99. Which activity is basic to living?

100. Give one term-science that deals with life processes.

101. What is the similarity between chlorophyll and haemoglobin?

102. Define Chemosynthesis.

103. What is photolysis of water? What are its products?

104. What are the important enzymes of pancreatic juice and their function?

105. Give reasons of dentalcaries in people.

106. With schematic diagram explain double circulation in man.

107. Explain mechanism of urine formation.

108. Why is diffusion in sufficient to meet oxygen requirement of multi cellularorganisms like us?

109. Explain the role of HC linour stomach.

110. What is the advantage of terrestrial organisms over aquatic organisms for obtaining oxygen for respiration?

111. How are lungs designed to maximize eareaf or gaseous exchange?

112. Describe fat digestion in human body and the organ where it occurs.

113. How are water and mineralst ransported in plants?

114. How are food and other substances transported in plants?

115. Give labeled Diagrams for the following.

a.Digestive system of man.

b.Respiratory system of man.

c.Structure of Nephron.

d.Structure of Stomata.

e.Structure of Heart.

f.Parts of Brain.

g.Reflex action and reflex arc.

116. Due to availability of less water, how does the plant cope up with lack of water in desert conditions?

117. After avigorous exercise, you may experience crampsiny our legmuscles.Whydoes this happen?

118. What will happen if carbon monoxide combines with haemoglobin?

119. Foodmovesdownthegutbyperistalsis.Whichregionofbraincontrolsperistalsis?

120. Name the pigment present in plants,which can absorb solar energy.

121. Name the respiratory organs of(i)fish(ii)mosquito(iii)earthworm.

122. Which of the four chamber soft he human hear thasthe thick estmuscular walls?

123. What will be the outcome if afarmer floods his field everyday?

124. Which part of visible spectrum is absorbed by chlorophyll pigments?

125. How does respiration in plants differ from that in animals?

126. Namethecartilaginousflapwhichclosestheglottistochecktheentryoffoodintoit during swallowing**.**

127. Which equipment is used to facilitate breathing during serious breathing problems?

128. Chloroplast are called energy convertors. Explain.

129. Why is the rate if breathing much faster in aquatic organisms than those of terrestrial organisms?

130. Why are glomeruli consider edasdialysis bags?

131. Autotroph ssynthesise food for the living world. Justify this statementin one sentence only interconnecting autotrophs and heterotrophs.

132. Veinsandarteriescarryblood.Whichofthesecarryblood?

a) Away from the heart?

b) Back to the heart?

133. Which of the organs perform the following functions in humans?

1. Absorption of food.
2. Absorption of water

134. Name the areas in a woody stem through which respiratory exchange of gases take place.

135. Too the name is one of the hardest substances in ourbody. How does it undergo damage due to eating chocolates and sweets?

136. Acertain is use in a green plant some how get blocked and the leaves wilted. What was the tissue that got blocked?

137. Write one feature which is common to each of the following pairs of the term/organs.

i) Glycogen and starch

ii) Chlorophyll land haemoglobin

iii) Gills and lungs

iv) arteriesandveins.

138. Why doesn't the lungs collapseeven after forceful expiration?

139. The two openings of the pharynx, one leading to trachea and the other leading to oesophagus, lievery close to each other. Yet food was wallow normally does not enter into our trachea. Why?

140. How would it affect the digestion of proteins and carbo hydrates if the duodenum of man if there is a blockade in the pancreatic duct?

ASSIGNMENT QUESTIONS SET–3 CHAPTER – 6

LIFE PROCESSES

1. Which of the following statements about the autotrophs is incorrect?

i. They synthesise carbo hydrates from carbondioxide and water in the presence of sunlight and chlorophyll

ii. They store carbohydrates in the form of starch

iii. They convert carbondioxide and water into carbo hydrates in the absence of sunlight

iv. They constitute the first trophic level in food chains

2. In which of the following group so forganisms, food material is broken down outside the body and absorbed?

(a) Mushroom, greenplants, *Amoeba*

(b) Yeast, mushroom, breadmould

(c) *Paramecium*, *Amoeba*, Cuscuta

(d) Cuscuta, lice, tapeworm

3. Select the correct statement

(a) Heterotrophs donot synthesise their own food

(b) Heterotrophs utilize solarenergy for photosynthesis

(c) Heterotro phssynthesise their own food

(d) Heterotrophs are capable of converting carbondioxide and water into carbohydrates

4. Which is the correct sequence of parts in human alimentary canal?

(a) Mouth→.stomach→.smallintestine→.oesophagus→.largeintestine

(b) Mouth→oesophagus→.stomach→.largeintestine→.smallintestine

(c) Mouth→.stomach→.oesophagus→.smallintestine→.largeintestine

(d) Mouth→.oesophagus→.stomach→.smallintestine→.largeintestine

5. If salivary amylase is lacking in the saliva, which of the following events in the mouth cavity will be affected?

(a) Proteins breaking down into amino acids

(b) Starch breaking down into sugars

(c) Fats breaking downinto fatty acids and glycerol

(d) Absorption of vitamins

6. The inner lining of stomach is protected by one of the following from hydrochloric acid. Choose the correct one

(a) Pepsin

(b) Mucus

(c) Salivaryamylase

(d) Bile

7. Which part of a limentary canal receives bile from the liver?

(a) Stomach

(b) Small intestine

(c) Large intestine

(d) Oesophagus

8. A few drops of iodine solution were added to rice water. The solution turned blue-black in colour. This indicates that rice water contains

(a) Complex proteins

(b) simple proteins

(c) fats

(d) starch

9. In which part of the alimentary canal food is finally digested?

(a) Stomach

(b) Mouth cavity

(c) Large intestine

(d) Small intestine

10. Choose the function of the pancreatic juice from the following

(a) Try psindigests proteins and lipase carbo hydrates

(b) Try psin digest semulsi fiedf at sand lipase proteins

(c) Trypsin and lipasedigest fats

(d) Trypsin digests proteins and lipaseemulsifiedfats

11. When air is blown from mouth in to a test-tube containing lime water, the limewater turned

milky due to the presence of

a) oxygen

b) carbon dioxide

c) nitrogen

d) water vapour

12. The correct sequence of an aero bicreactions in yeast is

(a) Glucose $\xrightarrow{cytoplasm}$ Pyruvate $\xrightarrow{mitochondria}$ Ethanol+Carbondioxide

(b) Glucose $\xrightarrow{cytoplasm}$ Pyruvate $\xrightarrow{cytoplasm}$ Lacticacid

(c) Glucose $\xrightarrow{cytoplasm}$ Pyruvate $\xrightarrow{mitochondria}$ Lactic acid

(d) Glucose $\xrightarrow{cytoplasm}$ Pyruvate $\xrightarrow{cytoplasm}$ Ethanol+Carbondioxide

13. Which of the following is most appropriate for aerobicrespiration?

(a) Glucose $\xrightarrow{mitochondria}$ Pyruvate $\xrightarrow{cytopla\ sm}$ $CO_2+H_2O+Energy$

(b) Glucose $\xrightarrow{cytoplasm}$ Pyruvate $\xrightarrow{mitochondria}$ $CO_2+H_2O+Energy$

(c) Glucose $\xrightarrow{cytoplasm}$ Pyruvate+Energy $\xrightarrow{mitochondria}$ CO_2+H_2O

(d) Glucose $\xrightarrow{cytoplasm}$ Pyruvate+Energy $\xrightarrow{mitochondria}$ $CO_2+H_2O+Energy$

14. Which of the following statement(s)is(are)true about respiration?

i. During inhalation, ribsmove inward and diaphragmis raised

ii. Inthealveoli,exchangeofgasestakesplacei.e.,oxygenfromalveolarairdiffusesinto blood and carbon dioxide from blood into alveolar air

iii. Haemoglobin has greater affinity for carbon dioxide than oxygen

iv. Alveoli increase surface area for exchange of gases

(a)(i)and(iv) (b)(ii)and(iii)

(c)(i)and(iii) (d)(ii)and(iv)

15. Which is the correct sequence of air passage during in halation?

(a) Nostrils→.larynx→.pharynx→.trachea→.lungs

(b) Nasalpassage→.trachea→.pharynx→.larynx→.alveoli

(c) larynx→.nostrils→.pharynx→.lungs

(d) Nostrils→.pharynx→.larynx→.trachea→.alveoli

16. During respiration exchange of gases take place in

(a) tracheaandlarynx

(b) alveolioflungs

(c) alveoliandthroat

(d) throatandlarynx

17. Which of the following statement(s)is(are)true about heart?

i. Leftatriumreceivesoxygenatedbloodfromdifferentpartsofbodywhilerightatrium receives deoxygenated blood from lungs
ii. Leftventriclepumpsoxygenatedbloodtodifferentbodypartswhilerightventricle pumps deoxygenated blood to lungs
iii. Leftatriumtransfersoxygenatedbloodtorightventriclewhichsendsittodifferent body parts
iv. Rightatriumreceivesdeoxygenatedbloodfromdifferentpartsofthebodywhileleft ventricle pumps oxygenated blood to different parts of the body

(a)(i) (b)(ii) (c)(ii)and(iv) (d)(i)and(iii)

18. What prevents backflow of blood inside the heart during contraction?

(a) Valves in heart

(b) Thick muscular walls of ventricles

(c) Thin walls of atria

(d) All of the above

19. Single circulation i.e. ,blood flows through the heart only once during one cycle of passage through the body, is exhibited by

(a) Labeo,Chameleon,Salamander

(b) Hippocampus,Exocoetus,Anabas

(c) Hyla,Rana,Draco

(d) Whale,Dolphin,Turtle

20. Inwhichofthefollowingvertebrategroup/groups,heartdoesnotpumpoxygenatedblood to different parts of the body?

(a) Pisces and amphibians

(b) Amphibians and reptiles

(c) Amphibiansonly

(d) Piscesonly

21. Choose the correct statement that describe sarteries.

i. Theyhavethickelasticwalls,bloodflowsunderhighpressure;collectbloodfrom different organs

and bring it back to the heart

ii. Theyhavethinwallswithvalvesinside,bloodflowsunderlowpressureandcarry blood away from the heart to various organs of the body

iii. Theyhavethickelasticwalls,bloodflowsunderlowpressure;carrybloodfromthe heart to various organs of the body

iv. Theyhavethickelasticwallswithoutvalvesinside,bloodflowsunderhighpressure and carry blood away from the heart to different parts of the body.

22. The filtration unit soft kidneys are called

i. ureter

ii. urethra

iii. neurons

iv. nephrons

23. Oxygen liberated during photosynthes is comes from

(a) water

(b) chlorophyll

(c) carbondioxide

(d) glucose

24. The blood leaving the tissues become sricher in

(a) carbondioxide

(b) water

(c) heamoglobin

(d) oxygen

25. Which of the following is an incorrect statement?

(a) Organisms grow with time

(b) Organisms must repair and maintain their structure

(c) Movement of molecules does not takeplac eamongcells

(d) Energy is essential for life processes

26. The internal(cellular)energy reserve in autotrophsis

(a) glycogen

(b) protein

(c) starch

(d) fattyacid

27. Which of the following equations is the summary of photosynthesis?

(a) $6CO_2+12H_2O\rightarrow .C_6H_{12}O_6+6O_2+6H_2O$

(b) $6CO_2+H_2O+Sunlight\rightarrow .C_6H_{12}O_6+O_2+6H_2O$

(c) $6CO_2+12H_2O+Chlorophyll+Sunlight\rightarrow .C_6H_{12}O_6+6O_2+6H_2O$

(d) $6CO_2+12H_2O+Chlorophyll+Sunlight\rightarrow .C_6H_{12}O_6+6CO_2+6H_2O$

28. Choose the event that does not occur inphotosynthesis

(a) Absorption of light energy by chlorophyll

(b) Reduction of carbon dioxideto carbohydrates

(c) Oxidation of carbon ocarbondioxide

(d) Conversion of light energy to chemical energy

29. Theopening and closing of the stomata lpore dependsupon

(a) oxygen

(b) temperature

(c) waterin guard cells

(d) concentration of CO2instomata

30. Choosetheformsinwhichmostplantsabsorbnitrogen

(i) Proteins

(ii) NitratesandNitrites

(iii) Urea

(iv) Atmospheric nitrogen

(a)(i)and(ii) (b)(ii)and(iii) (c)(iii)and(iv) (d)(i)and(iv)

31. Which is the first enzymetomix with food in the digestive tract?

(a) Pepsin

(b) Cellulase

(c) Amylase

(d) Trypsin

32. Which of the following statement(s)is(are)correct?

(i) Pyruvate canbe converted into ethanolandcarbondioxide by yeast

(ii) Fermentation takesplace in aerobicbacteria

(iii) Fermentation takes place inmitochondria

(iv) Fermentation is a form of anaerobicrespiration

(a)(i)and(iii) (b)(ii)and(iv) (c)(i)and(iv) (d)(ii)and(iii)

33. Lackofoxygeninmusclesoftenleadstocrampsamongcricketers.Thisresultsdueto

(a) Conversion of pyruvate to ethanol

(b) Conversion of pyruvate to glucose

(c) Non conversion of glucose to pyruvate

(d) Conversion of pyruvatetol actic acid

34. Choose the correct path of urine in our body

(a) kidney→.ureter→.urethra→.urinarybladder

(b) kidney→.urinarybladder→.urethra→.ureter

(c) kidney→.ureters→.urinarybladder→.urethra

(d) urinarybladder→.kidney→.ureter→.urethra

35. Duringdeficiencyofoxygenintissuesofhumanbeings,pyruvicacidisconvertedinto lactic acid in the

(a) cytoplasm

(b) chloroplast

(c) mitochondria

(d) golgibody

36. Name the process in plants that links light energy with chemical energy

37. Name the Organisms that can prepare their ownfood

38. Name the cell organelle where photosynthesis occurs

39. Name the Cells that surround astomatalpore

40. Name the Organisms that cannot prepare their own food

41. Name anenzyme secreted from gastric glands in stomachthatactson proteins.

42. "All plants giveout oxygen during day and carbondioxide during night".Do you agree with this statement? Give reason.

43. How do the guard cells regulat eopening and closing of stomatal pores?

44. Two green plants are kept separately in oxygen free containers, one in the dark and the other in continuous light. Which one will live longer? Give reasons.

45. If a plant is releasing carbondioxide and taking in oxygen during the day, does it mean that there is no photosynthesis occurring? Justify your answer.

46. Why do fishes die when taken out of water?

47. Differentiate between an autotro phandaheterotroph.

48. Is 'nutrition' a necessity for an organism? Discuss.

49. What would happen if green plants disappear from earth?

50. Leaves of a healthy potted plant were coated with vaseline. Will this plant remain healthy for long? Give reasons for your answer.

51. How does aerobic respiration differ from anaerobic respiration?

52. Differentiate between an arteryandave in.

53. What are the adaptations of leaf for photosynthesis?

54. Why is small intestine in herbivores longer than in carnivores?

55. What will happen if mucus is not secreted by the gastric glands?

56. What is the significance of emulsification of fats?

57. What causes movement of food inside the alimentary canal?

58. Why does absorption of digested food occurmainly in the small intestine?

59. Why is therate of breathing in aquatic organismsmuch faster than interrestrial organisms?

60. Why is blood circulation in humanheart called double circulation?

61. What is the advantage of having fou rchambered heart?

62. Mention the major events during photosynthesis

63. Ineachofthefollowingsituationswhathappenstotherateofphotosynthesis?

(a) Cloudy days

(b) Norain fall in thearea

(c) Good manuring in th earea

(d) Stomata get blocked due to dust

64. Name the energy currency in the living organisms. When and where is it produced?

65. What is common for cuscuta, ticks and leeches?

66. Explain the role of mouth in digestion of food.

67. Whatarethefunctionsofgastricglandspresentinthewallofthestomach?

68. Namethecorrectsubstratesforthefollowingenzymes

(a)Trypsin (b)Amylase (c)Pepsin (d)Lipase

69. Why doveins have thin walls as compared to arteries?

70. What will happen if plate lets were absent in the blood?

71. Plants have low energy need sascompared to animals.Explain.

72. Why and how does water enter continuously into the root xylem?

73. Why is transpiration important for plants?

74. How do leaves of plants help in excretion?

75. Explain the process of nutrition in *Amoeba*.

76. Describe the alimentary canal of man.

77. Explain the process of breathing in man.

78. Explain the importance of soil for plant growth.

79. Draw the diagram ofalimentary canalofmanandlabelthefollowingparts. Mouth, Oesophagus, Stomach, Intestine

80. How do carbohydrates, proteins and fats get digested in human beings?

81. Explain the mechanism of photo synthesis.

82. Explain the three path ways of break down in living organisms.

83. Describe the flow of blood through the heart of human beings.

84. Describe the process of urine formation in kidneys.

85. Whyistheprocessofdiffusioninsufficienttomeettheoxygenrequirementofhuman beings?

86. Draw a diagram of human alimentary canal showing duodenum,small intestine, liver and pancreas.

87. Draw a diagram of the human urinary system and labelinit.

88. What do you mean by double circulation of blood?

89. "If there were no algae there would be no fish in the sea".Comment.

90. Write the functions of the following in the digestive process:

(i)Bile (ii)Bi carbonate secreted by the duodenal wall.(iii)Pancreatic amylase.