

# Biology

## Chapter 6- Life Processes

### In text Questions with answers

1. Why is diffusion insufficient to meet oxygen requirements of multicellular organisms like humans

Ans Hint: human like multi cellular organisms require a lot of oxygen to reach every part of the body quickly whereas diffusion is a slow process so.....

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

Ans Hint: From outward may be walking, body movements, feeding etc but more surely if the life processes like respiration, metabolism are there then it is alive.

3. What are outside raw materials for an organism?

Ans Hint: If autotrophs like green plants then water, CO<sub>2</sub> and O<sub>2</sub> also and if it is heterotrophs then O<sub>2</sub>, nutrients, food from outside. So it depends on organism complexity.

4. What processes would you consider essential for maintaining life?

**Ans. Hint.** All processes that perform the maintenance function of living organisms are called life processes. So all the life processes like respiration, excretion, digestion all are essential for maintaining life.

5. What are the differences between autotrophic nutrition and heterotrophic nutrition?

6. **Ans.**

<b>Autotrophic Nutrition (Self dependent)</b>	<b>Heterotrophic Nutrition (Dependent on autotrophs)</b>
1. Food is made from inorganic components.	Food is obtained from organic components
2. Chlorophyll and sunlight is required.	Chlorophyll and sunlight is not required.
3. Photosynthesis or chemosynthesis takes place.	These processes do not occur.
4. It occurs in green plants and some bacteria.	It occurs in animals and insectivorous plants.

**Q6.** Where do plants get each of the raw materials required for photosynthesis?

**Ans.** For photosynthesis plants obtain the following raw materials:

- (i) **Water:** Roots absorb it from the soil.
- (ii) **Carbondioxide:** Stomata in leaves allow the carbon dioxide gas to enter into the plant.
- (iii) **Chlorophyll:** It is already present in the leaves. It is of many types.
- (iv) **Sunlight:** From the sun.

**Q7.** What is the role of acid in our stomach?

**Ans.** Acid (HCl) present in our stomach makes the medium acidic so as to facilitate the action of the enzyme pepsin (In active pepsinogen to pepsin conversion) and it kills the bacteria ingested with food.

**Q8.** What is the function of digestive enzymes?

**Ans.** Digestive enzymes act on the complex food to break them into simpler components. It ultimately helps in absorption of food. For example human cells can absorb monosaccharides so amylase, maltase work on complex carbohydrates to break it into glucose or fructose like monosaccharides.

**Q9.** How is the small intestine designed to absorb the digested food?

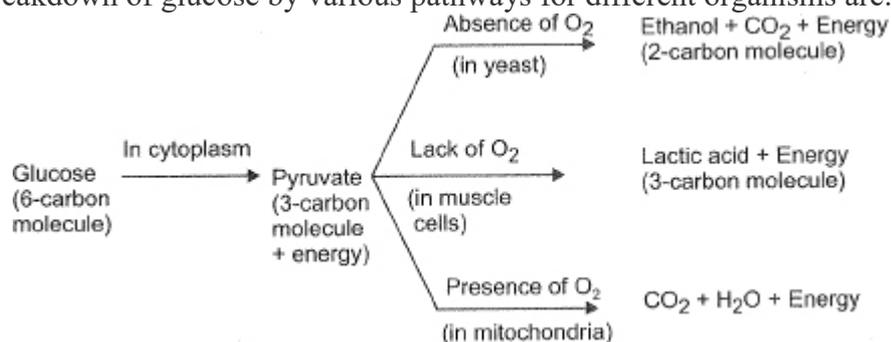
**Ans.** Small intestine has finger like projection in the inner lining which increases the surface area for absorption of food. These finger like projections are called villi. The villi are richly supplied with blood vessels which take the absorbed food to each and every cell of the body.

**Q10.** What advantages over an aquatic organism does a terrestrial organism have with regard to obtaining oxygen for respiration?

**Ans.** Aquatic organism takes in the oxygen dissolved in water which is in less percentage than the oxygen present in air. Terrestrial organism can take in more amount of oxygen at a time than aquatic organisms so we have no need to breathe fast.

**Q11.** What are the different ways in which glucose is oxidised to provide energy in various organisms?

**Ans.** Breakdown of glucose by various pathways for different organisms are:



**Q12.** How is oxygen and carbon dioxide transported in human beings?

**Ans.** Oxygen is carried by haemoglobin present in the RBC of the blood, carbon dioxide is soluble in water and hence is transported by the blood (plasma) in dissolved form. Oxygen is carried to the cells whereas carbon-di-oxide is carried away from the cells. Exchange of gases takes place between the alveoli of lungs and the surrounding blood capillaries. Oxygen is absorbed by the blood capillaries from the lungs alveoli by diffusion while carbon-dioxide is absorbed by the lungs alveoli from blood capillaries by diffusion.

**Q13.** How are lungs designed in human beings to maximise the area for exchange of gases?

**Ans.** In human beings lungs have the tubes called bronchioles which divide into smaller tubes and terminate into balloon like structures called alveoli. The alveoli provide large surface

area where the exchange of gases can take place. The walls of the alveoli usually contains an extensive network of blood vessels.

Here it is also getting help from diaphragm, ribs and intercostal muscles.

**Q14.** What are the components of transport system in human beings? What are the functions of these components?

**Ans.** In human beings the transport system consists of the following:

- (i) **Heart:** It acts as a pumping organ.
- (ii) **Blood:** It is the transport medium. It is made up of:
  - (a) Plasma–It carries food molecules, nitrogenous wastes, salts, carbon dioxide, hormones proteins etc. in a dissolved form.
  - (b) RBC–Consists of haemoglobin and transports oxygen.
  - (c) WBC–Helps to fight infection.
  - (d) Platelets–Helps in the clotting of blood.
- (iii) **Blood vessels:**
  - (a) Arteries–Carry oxygenated blood away from the heart to each and every cell.
  - (b) Veins–Bring de-oxygenated blood to heart for purification.

**Q15.** Why is it necessary to separate oxygenated and deoxygenated blood in mammals and birds?

**Ans.** Mammals and birds need large amount of energy for their life processes and these are warm blooded animals (Homoeothermic). They need to keep their body temperature constant. Hence the oxygenated blood can help them to obtain this energy by breaking down the food.

**Q16.** What are the components of the transport system in highly organised plants?

**Ans.** The components of the transport system are xylem (For water and minerals) and phloem(For nutrients food supply) in highly organized plants.

**Q17.** How are water and minerals transported in plants?

**Ans.** Water and minerals are transported in plants with the help of xylem tissue. Roots absorb the water from the soil by actively taking up ions, creates the difference in the concentration of these ions between the root and the soil. Water enters the root cells. The water moves up creating a column of water that is steadily pushed upwards in vessels and tracheids of the roots, stem and leaves, and are interconnected to form a continuous system of water-conducting channels reaching all parts of the plant. The water loss by leaves through stomata is called transpiration. It creates a suction pull, which pulls water from the xylem cells of roots.

**Q18.** How is food transported in plants?

**Ans.** The transport of food in plants is called translocation. It takes place with the help of a conducting tissue called phloem. Phloem transports glucose, amino acids and other substances from leaves to root, shoot, fruits and seeds. Sieve tube and companion cells help in transporting the food in upward and downward directions. Sucrose like materials are transported using energy from ATP and osmotic pressure, which is caused due to water. This pressure moves the material in the phloem to tissues which have less pressure. This pressure helps in the movement of material in plants.

**Q19.** Describe the structure and functioning of nephrons.

Diagram already provided.. with notes also you can try the below one.

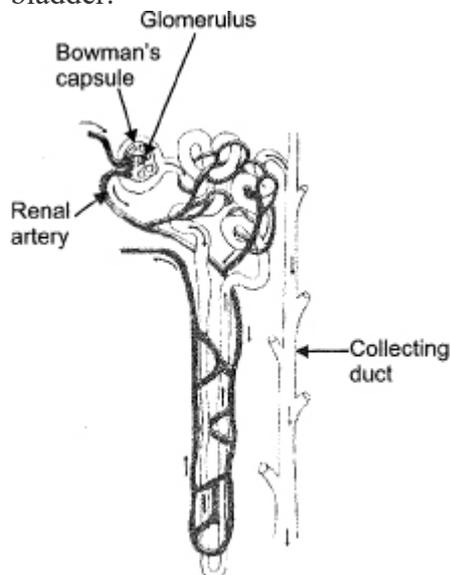
**Ans.** Structure of nephrons: It consists of a Bowman's capsule in which glomerulus is present (cluster of capillaries). The afferent artery brings the impure blood to nephron. The cup shaped structure (Bowman's capsule) form a tubular part of nephron which leads to collecting duct.

#### **Working of Nephron**

(i) **Filtration:** The renal artery or afferent artery is wider and slowly it becomes a narrow tube in the glomerulus. Due to difference in the width, pressure difference is caused and water with dissolved impurities are squeezed out from the tube. It is collected in the Bowman's capsule which is cup like structure and passes into the tube.

(ii) **Reabsorption:** The above filtrate passes through the tubule where the major amount of water, glucose, amino acids are selectively reabsorbed by the capillaries which are surrounding the tubule.

(iii) **Urine formation:** The water and impurities which is not reabsorbed is sent to a collecting duct. This filtrate contains more of dissolved nitrogenous wastes i.e. urea and hence it is termed as urine. From here the urine enters the ureter and is collected in urinary bladder.



Structure of a nephron

**Q20.** What are the methods used by plants to get rid of excretory products?

**Ans.** Wastes excreted from plants are:

(i) Gaseous wastes—through stomata pores CO<sub>2</sub> is given out during respiration and O<sub>2</sub> is given out during photosynthesis.

(ii) Liquid wastes (water)—through stomata pores by transpiration.

(iii) Other wastes—are stored in leaves dead cells and the leaves fall off.

Some other waste products are stored as resins and gums in old xylem of the plant and other wastes are also thrown out from nodes into the soil.

**Q21.** How is the amount of urine produced regulated?

**Ans.** The amount of urine produced depends on how much excess water there is in the body and how much of dissolved waste there is to be excreted. On a hot day, when we sweat and lose a lot of body water and salts, most of the water and salts in kidney will be reabsorbed into the blood from the filtrate in the tubule. Thus the volume of urine produced will be less.

In winters, when we do not sweat a lot, a little water and salts will be reabsorbed and the volume of urine produced will be more.

Thus there is perfect osmoregulation in the body. Loop of Henle, ADH hormone play important role in this.

Note: Also you can add more from related video classes or class notes. Here only ans hints given.