# Life Processes: In-Text Questions

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**Q.1 Why is diffusion insufficient to meet the oxygen requirements of multicellular organisms like humans?**

***Sol.*** The multicellular organisms have larger body size than unicellular organisms. They require lots of oxygen for their energy requirement. Diffusion is a slow process and passive mode of transport of substances. It can transfer gases up to a very small distance only. This will not be sufficient to meet the oxygen requirements of multicellular organisms like humans.

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

***Sol.*** The main criteria to decide for life, is breathing and respiration. No sign of breathing or respirations shows that organism is not alive. Living beings also show growth and movement.

**Q.3 What are outside raw materials used for by an organism?**

***Sol.*** Organic materials like- minerals, water and gases ($O_2$, $CO_2$ etc.) are outside raw materials used by an organism.

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

***Sol. The p***rocesses essential for maintaining life are:
(i) Nutrition
(ii) Respiration
(iii) Reproduction
(iv) Excretion
(v) Locomotion or movement
(vi) Digestion
(vii) Circulation
(viii) Transportation

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**Q.1 What are the differences between autotrophic nutrition and heterotrophic nutrition?**

***Sol.*** *T*he differences between autotrophic nutrition and heterotrophic nutrition:

| **Autotrophic nutrition** | **Heterotrophic nutrition** |
|---|---|
| 1. In this mode of nutrition, organism is preparing its own food. | 1. In this mode of nutrition, organism does not prepare its own food. |
| 2. These organisms do not dependent on any other organisms for food. | 2. These organisms depend on autotrophs for food. |
| 3. In this mode of nutrition, food is prepared from $CO_2$, water and sunlight. | 3. In this mode of nutrition, food cannot be prepared from $CO_2$, water and sunlight. |
| 4. Example: Green plants and certain bacteria. | 4. Example: All animals and Fungi etc. |

**Q.2 Where do plants get each of the raw materials required for photosynthesis?**

***Sol.*** Plants required the raw material for photosynthesis:

1. Plants obtain $CO_2$ from atmosphere through stomata.
2. Water is absorbed by roots of plant from the soil.
3. Sunlight is obtained from the sun. It is an essential raw material for photosynthesis.
4. Required nutrients like nitrogen compounds are obtained from soil by plant roots.
5. Chlorophyll is present in chloroplast which is present in green leaves and green parts of plants.

**Q.3 What is the role of the acid in our stomach?**
***Sol.*** The hydrochloric acid is secreted in our stomach which helps in killing harmful germs and bacteria.

**Q.4 What is the function of digestive enzymes?**
***Sol.*** Digestive enzymes break down the complex molecules of food into simpler and absorbable molecules. This makes the food simpler for the body to absorb it.

**Q.5 How is the small intestine designed to absorb digested food?**
***Sol.*** In the small intestine, the innermost layer has finger like structures. These are known as villi. Several folds of villi increase the absorbing surface of small intestine and absorb simpler molecules from food.

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**Q.1 What advantage over an aquatic organism does a terrestrial organism have with regard to obtaining oxygen for respiration?**
***Sol.*** In the aquatic habitat, the oxygen is available as dissolved in water, so taking oxygen from there is not a very efficient method. Therefore the aquatic organisms have much faster rate of breathing.
While in terrestrial habitat, oxygen is available in free form in the atmosphere. So, it is easier to absorb by organisms. From this, the terrestrial organisms can facilitate better utilization of food by way of respiration.

**Q.2 What are the different ways in which glucose is oxidised to provide energy in various organisms?**
***Sol.*** There are two ways of respiration for oxidization of glucose.
**(a) Aerobic respiration:** In this process, the complete oxidation of glucose occurs and form water and carbon dioxide. Thus, maximum output of energy is achieved.
**(b) Anaerobic respiration:** In this process, the incomplete oxidation of glucose occurs and form either lactic acid or alcohol. Usually bacteria and Even sometimes in our calf muscles anaerobic respiration takes place.

**Q.3 How is oxygen and carbon dioxide transported in human beings?**
***Sol.*** Oxygen and carbon dioxide are transported in human beings with help of a system. This system is mainly composed of parts lungs, Heart, Veins, and Arteries.
(i) In transportation of oxygen, haemoglobin present in the blood takes the oxygen from the air filled alveoli in the lungs. It carries the oxygen to the cells of different body parts for the energy production by aerobic respiration.
(ii) In transportation of carbon dioxide, it is mostly transported from cells of different body part in the dissolved form in our blood plasma to lungs. Here $CO_2$ diffuses from blood to air in the lungs.

**Q.4 How are the lungs designed in human beings to maximise the area for exchange of gases?**
***Sol.*** The lungs have the small bag like structure in it. This increases the surface area inside lungs. This helps in making a larger amount of exchange the gases.

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**Q.1 What are the components of the transport system in human beings? What are the functions of these components?**
***Sol.*** The transport system in human being consist of heart, blood and blood vessels:
**Heart:** Heart pumps blood to the all the body parts. Blood carries gases, food and waste product. So, heart plays a major role in transportation.
**Blood:** Blood transports oxygen through haemoglobin, CO2 through plasma, nutrients, and nitrogenous wastes in our body.

**Blood vessels:** Blood is transported through the vessels, arteries and veins to all parts of body.

### Q.2 Why is it necessary to separate oxygenated and deoxygenated blood in mammals and birds?

***Sol.*** Mammals and birds are warm blooded animals. So, they need to control their body temperature. Due to this, birds and mammals require optimum oxidization of glucose and good supply of oxygen. By these four chambered heart, they segregate the oxygenated and deoxygenated blood in their bodies which is their need because of their habit and habitat.

### Q.3 What are the components of the transport system in highly organized plants?

***Sol.*** The plant transport system in highly organized plants contains the components:
**(i) Xylem:** It helps to transport water and minerals from roots to different parts of plant.
**(ii) Phloem:** It helps to transport food from leaves to other parts of plant.

### Q.4 How are water and minerals transported in plants?

***Sol.*** In plants, water and minerals are transported through the xylem from roots. Due to transpiration in leaves, a suction effect is created in roots, is called root pressure. This root pressure helps in rise of water and minerals up to some height.

### Q.5 How is food transported in plants?

***Sol.*** In plants, food is transported through phloem. The transport in phloem is an active process because it involves use of energy. The energy in the form of ATP created osmotic pressure in the tissue causing water to move which results in transportation of food through phloem.

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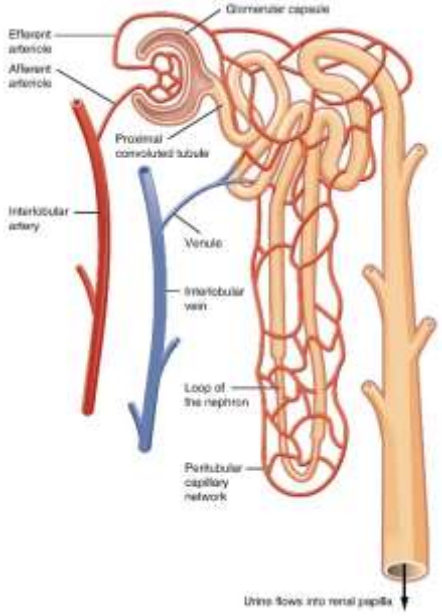
### Q.1 Describe the structure and functioning of nephrons.

***Sol.*** A nephron is the functioning unit of kidney. Nephron contains of a capsule shaped structure called Bowman's capsule. When blood with high pressure is passed through this Bowman's capsule, the filtration of blood takes place. After this filtration, waste product goes to a network of tubules. In this part, the substances like sugar (glucose), amino acid, ions and excess water which are required by the body, are reabsorbed. The remaining substance finally meet in in ureter which carries urine to the urinary bladder.




### Q.2 What are the methods used by plants to get rid of excretory products?

***Sol.*** Plants get rid of the gaseous product like-carbon dioxide and oxygen through diffusion. Plants store the solid and liquid waste product in leaves and branches. They get rid of these branches and leaves by shed off. Plants release some waste products in the soil through roots also. Some waste products are secreted near bark in form of raisins or gums.

**Q.3 How is the amount of urine produced regulated?**

Sol. The amount of urine produced is regulated by kidney. The kidney has a mechanism to reabsorb water from the filtrate which depends on how much water is remain in the body and in the filtrate. This gives a signal to the brain, then it takes the required action to either reabsorbing water or releasing more water. Thus the amount of urine formation is regulated by kidneys.