

# NCERT SOLUTIONS OF Life Processes

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## Question 1:

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

**Answer:** The body structure of multicellular organism such as humans is very complex. They comprised of specialized cells and tissues for performing various important functions of the body. Unlike the unicellular organisms, multicellular organisms are not in the direct contact with surrounding environment. Therefore, simple diffusion will not meet the oxygen requirement of all the cells and tissues.

## QUESTION 2:

**What criteria do you use to decide whether something is alive?**

**Answer:** Movement of various type such as walking, breathing or growing which are visible to us can be taken as an indication of life. However a living organism can also have movements which are not visible to the naked eye. So, the presence of life process is the fundamental criteria that are used to decide whether something is alive or not.

## QUESTION 3:

**What are outside raw materials used by an organism?**

**Answer:**

food for providing energy
Oxygen for breakdown of food to obtain energy
Water for proper digestion of food and water functions inside the body.

## QUESTION 4:

**What process would you consider essential for maintaining life?**

**Answer:** Life process which are essential

Nutrition
Respiration
Excretion
Transportation

**QUESTION 5:**

**What are the difference between autotrophic nutrition and heterotrophic nutrition?**

**Answer:**

<b>Autotrophic nutrition</b>	<b>Heterotrophic nutrition</b>
Food is synthesized from simple Inorganic raw material such as CO <sub>2</sub> And water	Food is obtained directly or indirectly from autotrophs. This food is broken down with help of enzymes
Presence of green pigment (chlorophyll) is necessary	No chlorophyll required
Food is generally prepared During day time	Food can be prepared at all times.
Example: All green plants and Some bacteria have this type of <b>nutrition</b>	Example: All animal and fungi have this type of <b>nutrition</b>

**QUESTION 6:**

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

**Answer:** Plants need the following things for photosynthesis:

Plants get CO <sub>2</sub> from atmosphere through stomata
Plants absorbed water from soil through roots and transport to leaves.

Sunlight, which is absorbed by the chlorophyll and other green parts of the plant.

**QUESTION 7:**

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

**Answer:** Roles of acid in our stomach are-

- (1) It makes an acidic medium in our stomach which is necessary for activation of pepsin enzyme.
- (2) It kills germs present in the food.

**QUESTION 8:**

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

**Answer:** Digestive enzymes such as amylase, lipase, trypsin, etc. help to break the complex food particles into simple ones so that these simple particles can be easily absorbed by the blood and thus transported to all the cells of the body.

**QUESTION 9:**

**How is the small intestine designed to digest food?**

**Answer:** The inner lining of the small intestine has millions of tiny finger-like projections called villi. These villi increase the surface area for absorption of food. These villi are richly supplied with blood vessels which take the absorbed food to each and every cell of the body, where it is used for obtaining energy, building up new tissues, and repairing old tissues.

**QUESTION 10:**

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

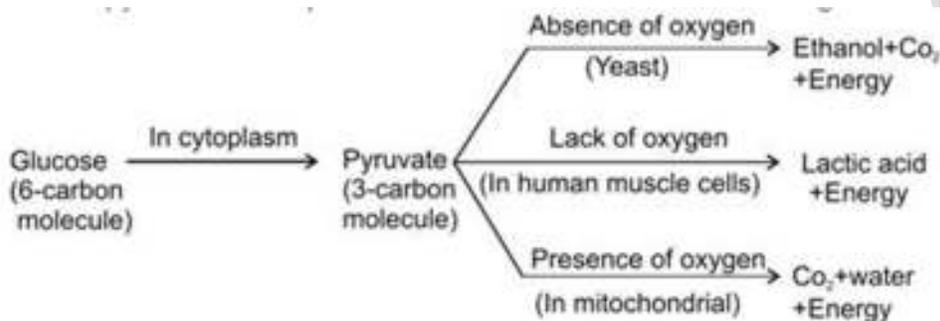
**Answer:** Terrestrial organisms take up oxygen from the atmosphere, whereas aquatic animals that live in water use oxygen dissolved in surrounding water. Since air dissolved in water has a fairly low concentration of oxygen, aquatic organisms have to breathe faster to get more oxygen. Terrestrial organisms take oxygen from the oxygen-rich atmosphere, so they have a much lower breathing rate than aquatic organisms.

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**Question 11**

**What are different ways in which glucose is oxidized to provide energy in various organisms?**

**Answer:** Glucose is broken down into three carbon molecule called pyruvate in the cell cytoplasm . Pyruvate is then further broken down by different ways to provide energy in various organism. Pyruvate is broken down in different ways on different organism is shown in the figure.



**(Break down of glucose by various pathways)**

- (1) In yeast cells during fermentation pyruvate is converted into ethanol and carbon dioxide in the absence of oxygen.
- (2) In mitochondria, breakdown of pyruvate takes place in presence of oxygen to give rise 3 molecules of carbon dioxide and water.
- (3) Sometimes, when there is lack of oxygen, especially during vigorous activity, in our muscles, pyruvate is converted into lactic acid.

**QUESTION 12**

**How are oxygen and carbon dioxide transported in human beings?**

**Answer:**

Transport of oxygen	Transport of carbon dioxide
The respiratory pigments (hemoglobin) present in red blood cells takes up the oxygen from the air to lungs. They then carry the oxygen to cells and tissues which are different in oxygen.	Carbon dioxide is more soluble in water. Hence, it is mostly transported from the body tissues in the dissolved form in our blood plasma to lungs where diffuses from blood to air in the lungs and then expelled out through nostrils

**QUESTION 13**

**How are lungs designed in human beings to maximize area for exchange of gases?**

**Answer:** In the lungs, the wind pipe branches into bronchi which in turn branches into bronchioles which finally terminate in balloon like structures called alveoli. Each lung contains about 300-350 million alveoli. The alveoli provide maximum surface for exchange of gases. The alveoli have very thin walls and are surrounded by an extensive network of blood vessels to facilitate exchange of gases.

**QUESTION 14**

**What are the components of the transport system in human beings?**

**Answer:** The components of the transport system in human beings are heart, blood, and blood vessels. (1) Heart receives deoxygenated blood from various body parts of the body and sends this impure blood to the lungs for oxygenation. After receiving the oxygenated blood it pumps oxygenated blood to all the parts of the body.

(2) Blood helps in transport of oxygen, nutrients, Carbon dioxide, and nitrogenous wastes throughout the body. WBC helps in protecting the body against infection and disease.

(3) The blood vessels (arteries, veins, and capillaries) help in circulating blood all throughout the body.

**QUESTION 15**

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

**Answer:** Warm-blooded animals such as birds and mammals maintain 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. It is therefore necessary to separate oxygenated and deoxygenated blood to maintain efficient supply of oxygen into the body. Hence, these animals require more oxygen for more cellular respiration so that they can produce more energy to maintain their body temperature.

**QUESTION 16**

**What are components of the transport system in highly organized plants?**

**Answer:** The components are

(1) **Xylem:** It helps to conduct water and minerals obtained from the soil to the rest of the plant.

(2) **Phloem:** It transports the food materials from the leaves to different parts of the plant body.

**QUESTION 17****How water and minerals are transported in plants?**

**Answer:** Water and minerals transported through xylem cells from soil to the leaves. The xylem cells of the roots stem and leaves are interconnected to form a conducting channel that reaches all parts of plant. Because of transpiration, a suction pressure is created as a result of which water is forced into the xylem cells of roots. From xylem cells of the roots a steady movement of water takes place through the interconnected water- conducting channels.

**QUESTION 18****How is the food transported in plants?**

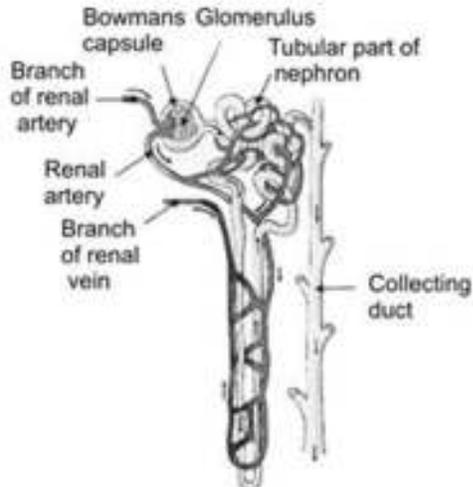
**Answer:** Phloem transported food materials from leaves to different parts of the plant body. Food is transported in dissolved form. This is called translocation. The transportation of food in phloem is achieved by utilizing energy from ATP. This energy increases the osmotic pressure, as a result, water from outside moves into the phloem. This pressure maintains the movement of food through all the parts of plants.

**QUESTION 19****Describe the structure and functioning of nephron.**

**Answer:** Nephrons are the basic filtering units of kidneys. Each kidney processes large number of nephron, approximately 1-1.5 million. The components of the nephron are

- 1) Glomerulus
- 2) Bowman's capsule
- 3) Long renal tubule.

**Diagram**



### Functioning of a nephron:

- (1) The blood enters the kidney through the renal artery, which branches into many capillaries associated with glomerulus.
- (2) The water and solute are transported to the nephron at Bowman's capsule.
- (3) In the proximal tubule, some substances such as amino acids, glucose, and salts are selectively reabsorbed and unwanted molecules are added in the urine.
- (4) The filtrate then moves down into the loop of Henle, where more water is absorbed.
- (5) From here, the filtrate moves upwards into the distal tubule and finally to the collecting duct. Collecting duct collect urine from many nephrons.

### QUESTION 20

**What are methods used by the plants to get rid of excretory product?**

**Answer:** Plants used the below ways to get rid of excretory products

- Many waste products are stored in vacuoles of the cells.
- Some waste products are stored in the leaves and they are removed as the leaves fall off.
- Some waste products such as resins, tannins and gums are stored in non-functional old xylem or bark.
- Plants also excrete some waste products through roots into the soil around them.
- Plants get rid of excess water through transpiration.

### QUESTION.21

**How amount of urine is 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.

**QUESTION 22**

The kidney in human beings is a part of the system for

- (a) Nutrition.
- (b) Respiration.
- (c) Excretion.
- (d) Transportation.

**Answer:** (c)

**QUESTION 23**

The xylem in plants is responsible for

- (a) Transport of water.
- (b) Transport of food.
- (c) Transport of amino acids.
- (d) Transport of oxygen.

**Answer:** (a)

**QUESTION 24**

The autotrophic mode of nutrition requires

- (a) Carbon dioxide and water.
- (b) Chlorophyll.
- (c) sunlight.
- (d) all of the above.

**Answer:** (d)

**QUESTION 25**

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

- (a) Cytoplasm
- (b) Mitochondria
- (c) Chloroplast
- (d) Nucleus.

**Answer:** (b)

#### **QUESTION 26**

**How are fats digested in our body? Where this process does takes place?**

**Answer:**

- Fats are present in 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 pancreas
- The bile salts (from the liver) break down the large fat globules into smaller globules so that the pancreatic enzymes can easily act on them.
- Lipase enzyme present in the pancreatic juice causes breakdown of emulsified fats.
- Glands present in the wall of small intestine secrete intestinal juice which contains lipase enzyme that converts fats into fatty acids and glycerol. This is referred to as emulsification of fats. It takes place in the small intestine.