

Exercises**Question 1:**

Why does an athlete breathe faster and deeper than usual after finishing the race?

Answer 1:

When the athlete runs in the race, his body needs more energy. In order to get extra energy, the athlete breathes faster. Because more oxygen is supplied to our cells. It speeds up the breakdown of food and more energy is released.

Question 2:

List the similarities and differences between aerobic and anaerobic respiration.

Answer 2:

- *Similarities:* Food is oxidized in both cases and energy is released.
- *Differences:* Carbon dioxide and water are the end products of aerobic respiration, while alcohol is the end product of anaerobic respiration. Aerobic respiration releases more energy than anaerobic respiration.

Question 3:

Why do we often sneeze when we inhale a lot of dust-laden air?

Answer 3:

When dust particles enter our nostril, it triggers a message to the brain. The brain instructs the nasal chamber to initiate sneezing. This is a method to remove the unwanted dust particles from the nostrils. Sneezing is a type of defence mechanism used by our body.

Question 4:

Take three test-tubes. Fill each of each with water. Label them A, B and C. Keep a snail in test-tube A, a water plant in test-tube B and in C, keep snail and plant both. Which test-tube would have the highest concentration of CO₂?

Answer 4:

Living organisms release CO₂ during respiration whereas plant utilize CO₂ for photosynthesis. So, the test tube A will have the highest concentration of carbon dioxide because the carbon dioxide as it comes only by respiration of snail. In test tubes B and C, a part of the carbon dioxide is utilized by the plant for photosynthesis and hence there is less concentration of carbon dioxide.

Question 5:

Tick the correct answer:

(a) In cockroaches, air enters the body through

(i) lungs (ii) gills (iii) spiracles (iv) skin

(b) During heavy exercise, we get cramps in the legs due to the accumulation of

(i) carbon dioxide (ii) lactic acid (iii) alcohol (iv) water

(c) Normal range of breathing rate per minute in an average adult person at rest is:

(i) 9 - 12 (ii) 15-18 (iii) 21-24 (iv) 30-33

(d) During exhalation, the ribs

(i) move outwards (ii) move downwards (iii) move upwards (iv) do not move at all

Answer 5:

- (a) In cockroaches, air enters the body through (iii) spiracles.
 (b) During heavy exercise, we get cramps in the legs due to the accumulation of (ii) lactic acid.
 (c) Normal range of breathing rate per minute in an average adult person at rest is (ii) 15-18.
 (d) During exhalation, the ribs (ii) move downwards.

Question 6:

Match the items in Column I with those in Column II:

Column I

- (a) Yeast
- (b) Diaphragm
- (c) Skin
- (d) Leaves
- (e) Fish
- (f) Frog

Column II

- (i) Earthworm
- (ii) Gills
- (iii) Alcohol
- (iv) Chest cavity
- (v) Stomata
- (vi) Lungs and skin
- (vii) Tracheae

Answer 6:

Column I

- (a) Yeast
- (b) Diaphragm
- (c) Skin
- (d) Leaves
- (e) Fish
- (f) Frog

Column II

- (iii) Alcohol
- (iv) Chest cavity
- (i) Earthworm
- (v) Stomata
- (ii) Gills
- (vi) Lungs and skin

Question 7:

Mark 'T' if the statement is true and 'F' if it is false:

- (i) During heavy exercise the breathing rate of a person slows down. (T/F)
- (ii) Plants carry out photosynthesis only during the day and respiration only at night. (T/F)
- (iii) Frogs breathe through their skins as well as their lungs. (T/F)
- (iv) The fishes have lungs for respiration. (T/F)
- (v) The size of the chest cavity increases during inhalation. (T/F)

Answer 7:

- (i) During heavy exercise the breathing rate of a person slows down. (**False**)
- (ii) Plants carry out photosynthesis only during the day and respiration only at night. (**False**)
- (iii) Frogs breathe through their skins as well as their lungs. (**True**)
- (iv) The fishes have lungs for respiration. (**False**)
- (v) The size of the chest cavity increases during inhalation. (**True**)

Question 8:

Given below is a square of letters in which are hidden different words related to respiration in organisms. These words may be present in any direction - upwards, downwards, or along the diagonals. Find the words for your respiratory system. Clues about those words are given below the square.

- (i) The air tubes of insects
- (ii) Skeletal structures surrounding chest cavity
- (iii) Muscular floor of chest cavity
- (iv) Tiny pores on the surface of leaf
- (v) Small openings on the sides of the body of an insect
- (vi) The respiratory organs of human beings
- (vii) The openings through which we inhale
- (viii) An anaerobic organism
- (ix) An organism with tracheal system

S	V	M	P	L	U	N	G	S
C	Z	G	Q	W	X	N	T	L
R	M	A	T	I	D	O	T	C
I	Y	R	X	Y	M	S	R	A
B	R	H	I	A	N	T	A	Y
S	T	P	T	B	Z	R	C	E
M	I	A	M	T	S	I	H	A
S	P	I	R	A	C	L	E	S
N	E	D	K	J	N	S	A	T

(Chapter - 10) (Respiration in Organisms)
(Class - VII)

Answer 8:

- (i) The air tubes of insects - Trachea
- (ii) Skeletal structures surrounding chest cavity - Ribs
- (iii) Muscular floor of chest cavity - Diaphragm
- (iv) Tiny pores on the surface of leaf - Stomata
- (v) Small openings on the sides of the body of an insect - Spiracles

(vi) The respiratory organs of human beings – Lungs

(vii) The openings through which we inhale – Nostrils

(viii) An anaerobic organism – Yeast

(ix) An organism with tracheal system – Ant

S	V	M	P	L	U	N	G	S
C	Z	G	Q	W	X	N	T	L
R	M	A	T	I	D	O	T	C
I	Y	R	X	Y	M	S	R	A
B	R	H	I	A	N	T	A	Y
S	T	P	T	B	Z	R	C	E
M	I	A	M	T	S	I	H	A
S	P	I	R	A	C	L	E	S
N	E	D	K	J	N	S	A	T

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Question 9:

The mountaineers carry oxygen with them because:

- (a) At an altitude of more than 5 km there is no air.
- (b) The amount of air available to a person is less than that available on the ground.
- (c) The temperature of air is higher than that on the ground.
- (d) The pressure of air is higher than that on the ground.

Answer 9:

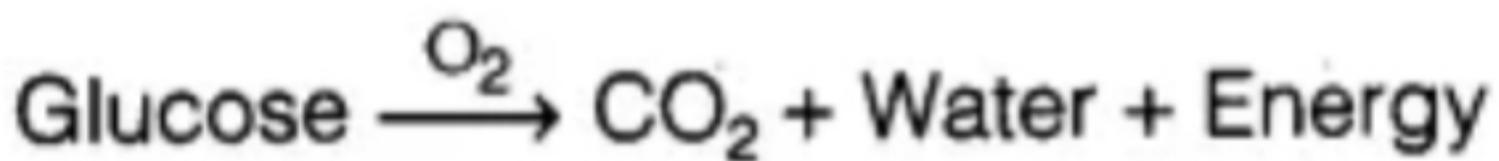
- (b) The amount of air available to a person is less than that available on the ground.

Question 1.

What are the end products of aerobic respiration.

Answer:

During aerobic respiration, carbon dioxide and water are released along with a large amount of energy.



Question 2.

The cellular respiration process takes place in which cell organelle?

Answer:

Cellular respiration takes place in the mitochondria of the cell.

Question 3.

Name the end products of anaerobic respiration in yeast.

Answer:

The end product formed during anaerobic respiration in yeast are

- Ethyl alcohol
- Carbon dioxide
- Energy

Question 4.

In some animals, exchange of gases takes place through its thin and moist skin. Name one such animal. [HOTS]

Answer:

Earthworm is an animal where exchange of gases during breathing or respiration takes place through its thin and moist skin.

Our nostrils has hair and mucous. What is the need to have them in our nasal cavity? [HOTS]

Answer:

Our nostrils possess hairs and mucous lining. These help in preventing dirt, dust and germs from entering our respiratory system.



Sometimes we see that farmers loosen the soil. What is the reason behind it?

Answer:

The farmers sometimes loosen the soil. This helps the root to respire through the air present in the space between soil particles.

Various organs constitute the respiratory system of human.

These organs are located according to their functions.

Identify them.

Answer:

The various organs in the respiratory system of human are nostrils, nasal passage, nasal cavity, windpipe and lungs.

When we exhale or breathe out, percentage of a certain gas is high. Name the gas.

Answer:

The gas, carbon dioxide is in higher percentage or amount, when we exhale or breathe out.

In the experiment, where we exhale into lime water containing glass.

What changes were observed by you?

Answer:

When we exhale into lime water its colour changes, into slightly milky white because exhaled air contains CO_2 .

All organisms breathe in O_2 and CO_2 . Should be less O_2 and excess of CO_2 in our environment. [HOTS]

Answer:

The CO_2 released by us is used by plants during the process of respiration and they release O_2 as a

result of this process which is used by rest of the organisms.

Respiration can occur in two different manners. Briefly explain the process of aerobic respiration. How does it differ from anaerobic respiration?

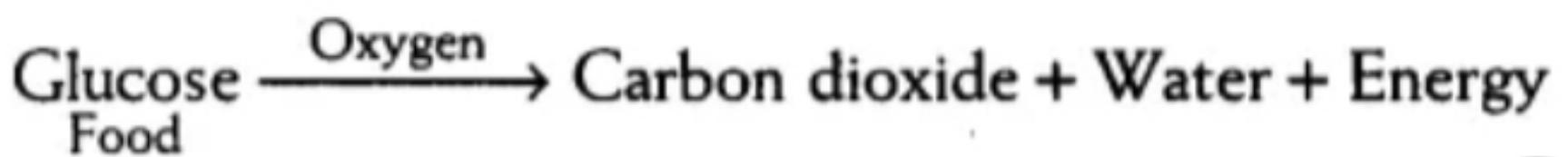
Answer:

Types of Respiration

On the basis of the presence or absence of oxygen, respiration is classified into two types:



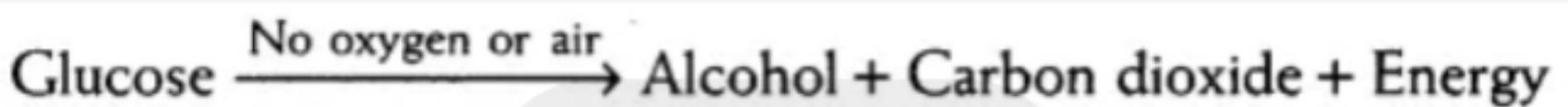
1. Aerobic Respiration: When breakdown of glucose occurs with the use of oxygen, it is called aerobic respiration. During aerobic respiration, glucose is completely broken down into carbon dioxide and water and energy is released. Aerobic respiration takes place in mitochondria. It can be shown by the following equation:



Aerobic respiration is seen in most of the organisms such as humans (man), dogs, cats, lions, elephants, cows, buffaloes, goats, snakes,

earthworms, frogs, fishes, etc.

2. Anaerobic Respiration: When breakdown of glucose takes place without using oxygen, it is called anaerobic respiration. The glucose is not completely broken down into carbon dioxide and water. An intermediate compound is formed with the release of less amount of energy during this process. It can be shown as follows:



Yeasts such as *Saccharomyces cerevisiae* and certain bacteria carry out anaerobic respiration. These organisms that carry out respiration in the absence of oxygen are called anaerobes.

There are three animals named A, B and C. Among them A can stay on land as well as in water. When it stays at land it respire through lungs but when it goes into water, it respire through its moist skin.

Animal B has specific organs to respire in the water which is not found in any other water animal.

While animal C is a water animal

which respire through nostrils and lungs. Now give the name of animal A, B and C. [HOTS]

Answer:

Animal A can live on land as well as in water and can respire through lungs as well as moist skin. The animal is frog.

Animal B lives in water and respire through a specific organ called gills. These are found in the tadpoles besides fishes. The animal B is a fish.

Animal C is also an aquatic animal which lives in sea water and respire through nostrils and lungs not by the gills. The animal is

whale.

Question 12.

When breathe is released after holding it for few minutes. What happens and give reason for its occurrence?

Answer:

Releasing breathe after holding it for sometime results in rapid breathing. It occurs to maintain a healthy balance between intake of O_2 and release of carbon dioxide.

(a) Plants lack a specialised respiratory system. How do they carry out respiratory process?

Explain.

(b) The plant roots being underground respire by using which mechanism?

Answer:

(a) The plants do not possess any respiratory system still plants respire. The various parts of the plants like leaves, roots, etc., carry out respiration independently.

These parts take in oxygen from air in different manner and utilise it to obtain energy and give out CO_2 .

The leaves of plants possess tiny pores on their surface which is called as stomata. The gaseous exchange during respiration takes

place through their stomata.

(b) Roots of the plants respire under the ground. Root cells get oxygen from the air present in the space between the soil particles.

There are several root hairs present on the roots of a plant.

The oxygen from the air (between soil particle) diffuses into root hair and reaches to the cells of the roots. This oxygen is utilised for respiration.

It is not wise to sleep under a tree during night. Why?

Answer:

During day, plants photosynthesise in the presence of sunlight and uses CO_2 produced during respiration. During this process O_2 is released as a byproduct and a balance between O_2 and CO_2 is maintained in the atmosphere.

But in the night, plants do not photosynthesise. Plants are unable to use CO_2 during night and produces CO_2 and takes O_2 during respiration.

This leads to the increase in the proportion of CO_2 in the air.

So, if one sleeps under a tree at night, he will have problems in

breathing as the amount of CO_2 in the air around will certainly be more than oxygen. Therefore, it is not advisable to sleep under trees

during night because the person will suffer from suffocation and feel excess weight on chest.