



# UNIQUE STUDY POINT

## Chapter 10 Respiration in Organisms NCERT Solutions

### EXERCISES

**Question 1:** Why does an athlete breathe faster and deeper than usual after finishing the race?

**Answer:** An athlete needs to supply extra energy to his muscle cells which have worked hard during running. For this, he breathes faster and deeper so that more oxygen is supplied to the cells. This speeds up the breakdown of food and as a result, more energy is released.

**Question 2:** List the similarities and differences between aerobic and anaerobic respiration.

**Answer: Similarities:** Food is oxidized in both cases and energy is released.

**Differences:**

| <b>Aerobic respiration</b>  | <b>Anaerobic respiration</b>   |
|---|--|
| It is the process of breakdown of food in the presence of oxygen. | It is the process of breakdown of food in the absence of oxygen.                         |
| Its end products are CO <sub>2</sub> and H <sub>2</sub> O.        | End products of anaerobic respiration can be lactic acid or CO <sub>2</sub> and alcohol. |
| It takes longer time to release energy.                           | It is a fast process as compared to aerobic respiration.                                 |
| It produces large amount of energy.                               | It produces small amount of energy as compared to aerobic respiration.                   |
| Examples: It occurs in most plants and animals.                   | Examples: Yeast, bacteria, human muscle cells, etc. respire anaerobically.               |

**Question 3:** Why do we often sneeze when we inhale a lot of dust-laden air?

**Answer:** We often sneeze when we inhale a lot of dust-laden air to expel out these foreign particles. These particles get past the hair in the nasal cavity and irritate the lining of the cavity which results in sneezing.

**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 CO<sub>2</sub>?

**Answer:** Test tube A will have the highest concentration of CO<sub>2</sub>. This is because test tube A contains snail. Snail is an organism that breathes in O<sub>2</sub> and breathes out CO<sub>2</sub>. Hence, CO<sub>2</sub> concentration increases in test tube A.

Test tube B contains a water plant, which takes in CO<sub>2</sub> for food synthesis and gives out O<sub>2</sub>. Hence, more O<sub>2</sub> concentration is found in test tube B.

Test tube C contains both a snail and a plant. The CO<sub>2</sub> produced by the snail is utilized by the plant for its food synthesis and the O<sub>2</sub> released by the plant is utilized by the snail for respiration.

Therefore, test tube A has the highest concentration of CO<sub>2</sub>.

**Question 5:** Tick the correct answer

(a) In cockroaches, air enters the body through

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

**Answer:** (a) (iii) spiracles

(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

**Answer:** (b) (ii) lactic acid

(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

**Answer:** (c) (ii) 15–18

(d) During exhalation, the ribs

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

**Answer:** (d) (ii) move downwards

**Question 6:** Match the items in Column I with those in Column II:

| Column I      | Column II           |
|---------------|---------------------|
| (a) Yeast     | (i) Earthworm       |
| (b) Diaphragm | (ii) Gills          |
| (c) Skin      | (iii) Alcohol       |
| (d) Leaves    | (iv) Chest cavity   |
| (e) Fish      | (v) Stomata         |
| (f) Frog      | (vi) Lungs and skin |

|  |               |
|--|---------------|
|  | (vii) Trachae |
|--|---------------|

**Answer:**

| Column I      | Column II           |
|---------------|---------------------|
| (a) Yeast     | (iii) Alcohol       |
| (b) Diaphragm | (iv) Chest cavity   |
| (c) Skin      | (i) Earthworm       |
| (d) Leaves    | (v) Stomata         |
| (e) Fish      | (ii) Gills          |
| (f) Frog      | (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:** (i) False

(ii) False

(iii) True

(iv) False

(v) 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 |

**Answer:**

- (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 |

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

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