Short Answer Questions

Q.1. Which gas present in air is essential for aerobic respiration? What is the role of oxygen during respiration?

[NCERT Exemplar]

Ans. Oxygen present in air is responsible for respiration. The oxygen breaks down food and releases energy.

Q.2. On an average, an adult human being at rest breathes 15-18 times per minute. The breathing rate, however, may differ under different conditions. Arrange the following activities given in the box in order of increasing breathing rates and give reason for your answer.

[NCERT Exemplar]

Sleeping, cycling, brisk walk, watching T.V

Ans. Sleeping < watching T.V. < brisk walk < cycling.

Whenever a person does an activity, the breathing rate becomes faster. It further increases with strenuous work to provide more oxygen to the cells to get more energy.

Q.3. On a very cold morning, Boojho and Paheli were talking with each other as they walked down to their school. They observed that the air coming out of their mouth looked like smoke. They were amused and wondered how it happened. Help them find the answer.

[NCERT Exemplar]

Ans. On a cold day, the warm and moist air exhaled by us condenses into mist when it comes in contact with the cold air of the atmosphere. This looks like white smoke.

Q.4. Whenever we feel drowsy or sleepy we start yawning. Does yawning help us in anyway?

[NCERT Exemplar]

Ans. During drowsiness, our breathing rate slows down. The lungs do not get enough oxygen from the air resulting in yawning. Yawning brings extra oxygen into the lungs and helps us to keep awake.

Q.5. Insects and leaves of a plant have pores through which they exchange gases with the atmosphere. Can you write two points of differences between these pores with respect to their position, number and extension into the body?

Ans. (a) Spiracles are present on the sides of insects' body while stomata are present on the lower surface of leaves.

(b) Spiracles are fewer in number as compared to stomata.

(c) Spiracles lead to an extensive network of tracheal system which is absent in the leaves.

Q.6. Explain the role of the diaphragm in the process of breathing.

Ans. When diaphragm contracts and moves downwards, the chest cavity enlarges and the pressure in lungs decreases. The air is breathed in to equalise pressure. When diaphragm relaxes and moves upwards, the lungs push out the air.

Q.7. Write the difference in the composition of inhaled and exhaled air.

Ans. The inhaled air has larger concentration of oxygen and lesser concentration of carbon dioxide, whereas exhaled air has larger concentration of carbon dioxide and lesser amount of oxygen.

Q.8. What happens to the air we breathe in, once it reaches the lungs?

Ans. When the air breathed in reaches the lungs it enters the alveoli. The alveoli are lined with blood capillaries and exchange of gases occurs. The oxygen from the alveoli is taken up by the capillaries and carbon dioxide from the blood is transferred to alveoli.

Q.9. How do frogs breathe on land and in water?

Ans. In water, frogs exchange gases through its thin, moist and smooth skin which is richly supplied with blood capillaries. On land, frogs breathe through lungs.

Q.10. Explain the process of breathing in fish.

Ans. Fish gulps water through mouth and forces it between the gills. The oxygen in it gets diffused into the blood circulating in gills and carbon dioxide in the bloodstream diffuses into the water which is carried out through a gap between fish’s body and the gill cover.

Q.11. Why should you breathe through your nose and not your mouth?

Ans. When we breathe through the nose, the dust particles, smoke, etc. get stuck in the hair present in the nose, which act as filters. But if we breathe through the mouth, all the dust will enter our body system.

Q.12. What facilitates opening and closing of stomatal pores?

Ans. The stomatal pores are enclosed by two guard cells, which are surrounded by several subsidiary cells. All these three, namely stomatal pores, guard cells and subsidiary cells together constitute stomatal apparatus. The flow of the water into and out of guard cells facilitates closing and opening of stomatal pores. This results in the exchange of gases.

Q.13. Explain respiration in plants.

Ans. In plants, air from the atmosphere is taken in through stomata. The carbon dioxide in the air is utilised in the process of photosynthesis by the chloroplasts and oxygen is released out through stomata.