

HOTS (Higher Order Thinking Skills)

Q.1. If a plant is releasing carbon dioxide and taking in oxygen during the day, does it mean that there is no photosynthesis occurring? Justify your answer.

Ans. Release of CO_2 and intake of O_2 gives evidence that either photosynthesis is not taking place or its rate is too low. Normally during day time, the rate of photosynthesis is much more than the rate of respiration. So, CO_2 produced during respiration is used up for photosynthesis hence CO_2 is not released.

Q.2. The leaves of a plant first prepare food A by photosynthesis then food A gets converted into food B. What are A and B?

Ans. Food A \rightarrow glucose, Food B \rightarrow starch

Q.3. Why do fishes die when taken out of water?

Ans. Fishes respire with the help of gills. Gills are richly supplied with blood capillaries and can readily absorb oxygen dissolved in water. Since fishes cannot absorb gaseous oxygen they die soon after they are taken out of water.

Q.4. What would happen if green plants disappeared from the Earth?

Ans. Green plants are the sources of energy for all organisms. If all green plants disappear from the Earth, all the herbivores will die due to starvation and so will the carnivores.

Q.5. Why is small intestine in herbivores longer than in carnivores?

Ans. Digestion of cellulose takes a longer time. Hence, herbivores eating grass need a longer small intestine to allow complete digestion of cellulose. Carnivorous animals cannot digest cellulose, hence they have a shorter intestine.

Q.6. What will happen if mucus is not secreted by the gastric glands?

Ans. Gastric glands in stomach release hydrochloric acid, enzyme pepsin and mucus. Mucus protects the inner lining of stomach from the action of hydrochloric acid and enzyme pepsin. If mucus is not released, it will lead to erosion of inner lining of stomach, leading to acidity and ulcers.

Q.7. Why is the rate of breathing in aquatic organisms much faster than in terrestrial organisms?

Ans. Aquatic organisms like fishes obtain oxygen from water present in dissolved state through their gills. Since the amount of dissolved oxygen is fairly low compared to the amount of oxygen in the air, the rate of breathing in aquatic organisms is much faster than that seen in terrestrial organisms.

Q.8. Why do veins have thin walls as compared to arteries?

Ans. Arteries carry blood from the heart to various organs of the body under high pressure so they have thick and elastic walls. Veins collect the blood from different organs and bring it

back to the heart. The blood is no longer under pressure so the walls are thin with valves to ensure that blood flows only in one direction.

Q.9. Why and how does water enter continuously into the root xylem?

Ans. Cells of root are in close contact with soil and so actively take up ions. The ion concentration increases inside the root and hence osmotic pressure increases the movement of water from soil into the root which occurs continuously.

Q.10. Why is more concentrated yellowish urine excreted in summers?

Ans. In summers consumption of water is increased and in spite of that excretory amount of urine is less. Because most of the water is excreted in the form of sweat which is evaporated soon due to high environmental temperature. It keeps our body cool and hence concentrated yellowish urine is excreted.

Q.11. Leaves of a healthy potted plant were coated with vaseline to block the stomata. Will this plant remain healthy for long? State three reasons for your answer.

Ans. If waxy coating is made on the surface of leaf, loss of water in the form of water vapour does not take place. Even the gaseous exchange will not take place. So, photosynthesis will either be reduced or will not take place.

The plant will not remain healthy for long because:

- (a) Exchange of gases will not take place.
- (b) Photosynthesis will either be reduced or will not take place due to lack of CO_2 .
- (c) Transpiration will not take place, so there will be no mechanism of cooling in hot weather.