

Board- ICSE	Std- 7 th	Topic- photosynthesis and Respiration
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Q.1 Multiple Choice Questions 1. Put a tick (✓) against the most appropriate alternative in the following statements.

(i) Carbohydrates are stored by plants in the form of:

(a) Vitamins (b) Proteins (c) Fats **(d) Glucose** .

(ii) Stomata are present on the surface of:

(a) Leaves (b) Roots (c) Stem (d) Flower petals

(iii) Which one of the following is an end-product of photosynthesis?

(a) Fructose **(b) Glucose** (c) Cellulose (d) Lactose

Q.2 Why do leaves generally look green ?

Ans. The green colour of a leaf is due to the presence of chlorophyll.

Q.3 Which four of the following are needed for photosynthesis in a leaf:

(i) Carbon dioxide:

(ii) Oxygen:

(iii) Nitrates :

(iv) Water:

(v) Chlorophyll:

(vi) Soil:

(vii) Light:

Ans. (i) Carbon dioxide: from air (iv) Water: from soil (v) Chlorophyll: contained in leaf (vii) Light: from sunlight

Q.4 What is the source of energy for photosynthesis ?

Ans. Light is the ultimate source of energy in photosynthesis because plants take in the sunlight CO₂ and H₂O and converts it into glucose.

Q.5 Which gas is taken in and which one is given out by the leaf in bright sunlight ? (i) Taken in : (ii)

Given out:

Ans. (i) Carbon dioxide (ii) Oxygen

Q.6 State whether the following statements are True or False:

(i) Green plants prepare their food by using two raw materials, oxygen and water.

False. Green plants prepare their food by using raw materials, CO₂, chlorophyll and water.

(ii) The chlorophyll enables the plants to use light energy. True

(iii) The free oxygen in the atmospheric air is the result of photosynthesis. True

(iv) Photosynthesis occurs only in chlorophyll-containing parts of the plant. True

Q.7 Differentiate between aerobic and anaerobic respiration. Write the overall chemical equations of the two kinds of respiration in plants. (i) Aerobic: (ii) Anaerobic:

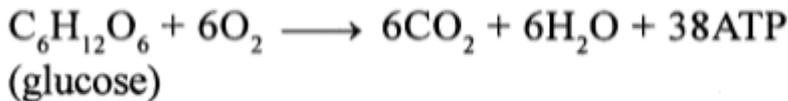
Answer: Aerobic respiration

1. It occurs in the presence of oxygen.
2. Here there is complete breakdown of glucose releasing carbon-di-oxide, energy. water and energy.
3. More energy is released (38 ATP).

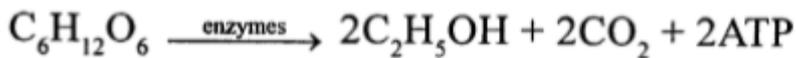
Anaerobic respiration

1. It occurs in the absence of oxygen.
2. There is partial breakdown of glucose into ethyl alcohol, carbon-di-oxide and
3. Lesser energy is released (2 ATP).

(i) Aerobic respiration:



(ii) Anaerobic respiration:



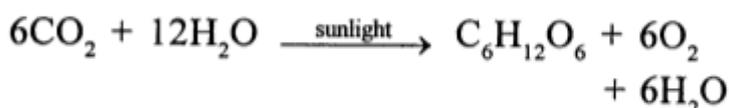
Q.8 Explain how photosynthesis is different from respiration. Answer: Photosynthesis

1. Anabolic process
2. Food is produced here.
3. Oxygen is by-product.
4. Chlorophyll and sunlight are required.
5. Occur only during daytime.
6. Occurs in green plants only.

Respiration

1. Catabolic process
2. Food is broken down form here to release energy
3. Carbon-di-oxide is the by-product.
4. Chlorophyll and sunlight are notrequired.
5. Occurs all the time
6. Occurs in all living beings including plants.

Photosynthesis :



Respiration:



Q.9 Do the plants respire all day and night or only during the night ?

Answer: The plants respire only during the night. Plants take in oxygen and give out carbon dioxide. Hence, there is some truth in the belief that one should not sleep under the trees at night

Q.10 Do the plants respire all day and night or only during the night ?

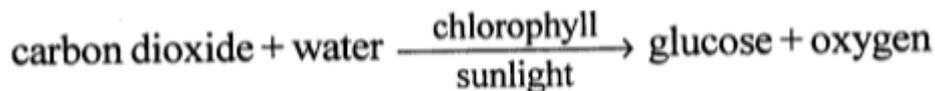
Answer: The plants respire only during the night. Plants take in oxygen and give out carbon dioxide. Hence, there is some truth in the belief that one should not sleep under the trees at night

Q.11 In order to carry out photosynthesis, what are the substances that a plant must take in ? Also mention their sources.

Answer: For preparing food, the plants require the following :

1. Water (from soil) 2. Carbon dioxide (from air) 3. Chlorophyll (contained in the leaf) 4. Energy (from sunlight)

The process of preparing or synthesising food using water from the soil and carbon dioxide from the air, together chlorophyll and sunlight is called photosynthesis. This entire process is a series of complex chemical reactions Photosynthesis is represented as follows:



Q.12 What is the role of chlorophyll in photosynthesis ?

Answer: This pigment is of utmost importance as it absorbs the sunlight which provides energy for the process of photosynthesis occurs inside the chloroplast of the leaf.

Q.13 Do plants need oxygen ? If so, what is its source ?

Answer: Yes plants need oxygen, all the free oxygen in the atmospheric air is the result of photosynthesis. No animal can survive without oxygen as it is needed for respiration. Even the plants use the same oxygen in dark for their own respiration.

Q.14 Define respiration.

Ans. The process of conversion of glucose molecules in food into energy rich molecules, carbondioxide and water with the help of oxygen is known as respiration.

Q.15 . What is the full form of ATP ?

Ans. ATP is the energy currency of cell. Its full form is Adenosine Triphosphate.

Q.16 What is respiratory tract ?

Ans. The path through which the air travels to the lungs and back to the atmosphere in humans is called the respiratory tract

Q.17 Define cutaneous respiration ?

Ans. The exchange of gases through moist skin and blood capillaries underneath is called cutaneous respiration.e.g. in frogs.

Q.18 What is the function of pleural fluid ?

Ans. Pleural fluid keeps the surface of the lungs moist for easy diffusion of gases (oxygen and carbon dioxide).

Q.19 What is the role of the diaphragm in breathing mechanism ?

Ans. Diaphragm moves up and down and helps in the exchange of air between the atmosphere and lungs.

Q.20 How is the process of cellular respiration different from breathing ?

Answer: Respiration

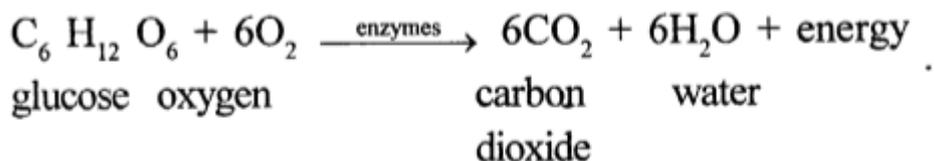
1. It is a complex bio- chemical process which involves enzymes.
2. It involves oxidation of glucose in to CO₂, water and energy.
3. Energy is released and stored in the form of ATP.
4. It takes place inside the cell

Breathing

1. It is a mechanical process without the involvement of enzymes.
2. It involves only the exchange of oxygen and CO₂.
3. No energy is released.
4. It takes place outside the cell.

Q.21 Explain the process of Cellular Respiration.

Answer: Cellular Respiration is a biochemical process which involves the oxidation of glucose to release energy, carbondioxide and water are released as by – products.



It involves a series of chemical reactions controlled by different enzymes. The energy released in the process is stored in the form of energy rich substance called ATP (Adenosine triphosphate). The ATP molecules are stored in the cells and later on can be broken down to release energy for various metabolic activities. The entire process takes place partially in the cytoplasm and partially in the mitochondria of our body cells. The process of conversion of glucose molecules in food in to energy rich molecules, CO₂ and water with the help of oxygen is known as respiration.

Q.22 In human beings, what happens to oxygen after it is inhaled through the nose ?

Answer: Air rich in oxygen, enters the body through the nostrils (nose). From the nose, air enters the pharynx which leads to larynx and then trachea (windpipe). From trachea, it enters the bronchi and enters the lungs. From bronchi, it enters bronchioles and finally the alveoli. The oxygen diffuses through the thin walls of blood capillaries (surrounding) into the blood and combines with hemoglobin to form oxy haemoglobin. The oxygen in blood is carried to all body cells where internal respiration takes place in a series of chemical reactions and food (in the form of glucose) is converted into carbon-dioxide water and energy in the form of ATP, using the oxygen.

Q.23 Show the mechanism of breathing in human beings.

Answer: The process of taking in oxygen and giving out carbondioxide is called breathing. It is a physical process and carried out by the movement of the various body parts.

1. Inhalation : When we inhale air our ribs move upwards and outwards and the diaphragm moves downwards. The volume of chest cavity increases and the air pressure is reduced, as a result of which air flows in to the lungs.

2. Exhalation : When we exhale air, that is breathe out air,the diaphragm moves upwards and the ribs move downwards and inwards. The space inside the chest cavity decreases and the air pressure is increased as, a result the air rushes out.

Q.24 Explain the process of exchange of gases in plants.

Answer: In plants, exchange of gases takes place through stomata and lenticels.

1. Stomata – They are tiny pores present on the lower surface of leaves and young green stems. The gaseous exchange takes place in plants mostly through stomata. They remain open during the day and close at night.

2. Lenticels – In certain trees, the mature roots and woody stems have tiny openings called lenticels which enable the oxygen to reach the intercellular spaces of interior tissues and carbon dioxide to be released into the atmosphere. The exchange of gases (oxygen and carbon dioxide) in plants takes place by two processes – photosynthesis and respiration

- Photosynthesis occurs during the day. It takes in carbon dioxide and gives out oxygen. A part of oxygen formed is used by plants for respiration and rest is given out through stomata
- Respiration occurs throughout day and night. Oxygen is used and carbon dioxide is given out. This carbon dioxide is used by the plant for photosynthesis during the day. At night, in the absence of photosynthesis, carbon dioxide is released into the air through stomata.

Q.25 Number the following organs in the correct order to show the path taken by fresh air at the time of inhalation. trachea, nose, bronchioles, bronchi, larynx, alveoli, pharynx, lungs

Answer nose →pharynx → larynx →trachea→bronchi → lungs →bronchioles →alveoli.