

## REVIEW QUESTIONS

### A. MULTIPLE CHOICE TYPE

(Select the most appropriate option in each case)

1. The production of starch, and not glucose, is often used as a measure of photosynthesis in leaves because

- a) starch is immediate product of photosynthesis
- b) glucose formed in photosynthesis soon gets converted into starch
- c) starch is soluble in water
- d) sugar cannot be used

Solution:-

b) glucose formed in photosynthesis soon gets converted into starch

2. The number of water molecules required in the chemical reactions to produce one molecule of glucose during photosynthesis is

- a) six
- b) twelve
- c) eighteen
- d) twenty-four

Solution:-

b) twelve

3. The rate of photosynthesis is not affected by

- a) light intensity
- b) humidity
- c) temperature
- d) CO<sub>2</sub> concentration

Solution:-

b) humidity

4. Chlorophyll in a leaf is required for

- a) breaking down water into hydrogen and oxygen
- b) emitting green light
- c) trapping light energy
- d) storing starch in the leaves

Solution:-

c) trapping light energy

5. If the rate of respiration becomes more than the rate of photosynthesis, plants will:

- a) continue to live, but will not be able to store food

- b) be killed instantly
- c) grow more vigorously because more energy will be available
- d) stop growing and die gradually of starvation

**Solution:-**

- a) continue to live, but will not be able to store food

**6. Which one chemical reaction occurs during photosynthesis?**

- a) Carbon dioxide is reduced and water is oxidised
- b) Water is reduced and carbon dioxide is oxidised
- c) Both carbon dioxide and water are oxidised
- d) Both carbon dioxide and water are reduced

**Solution:-**

- a) Carbon dioxide is reduced and water is oxidised

**7. The specific function of light energy in the process of photosynthesis is to**

- a) reduce carbon dioxide
- b) synthesise glucose
- c) activate chlorophyll
- d) split water molecule

**Solution:-**

- c) activate chlorophyll

**8. A plant is kept in a dark cupboard for 48 hours before conducting any experiment on photosynthesis in order to**

- a) remove chlorophyll from leaves
- b) remove starch from the leaves
- c) ensure that no photosynthesis occurred
- d) ensure that the leaves are free from starch

**Solution:-**

- d) ensure that the leaves are free from starch

**9. During photosynthesis, the oxygen in glucose comes from**

- a) CO<sub>2</sub>
- b) water
- c) both CO<sub>2</sub> and water
- d) oxygen via air

**Solution:-**

- a) CO<sub>2</sub>

**B. VERY SHORT ANSWER TYPE**

**1. Name the following:**

**(a) The category of organisms that prepare their own food from basic raw materials.**

**Solution:-**

Producers or Autotrophs are the organisms that prepare their own food from basic raw materials.

**(b) The kind of plastids found in the mesophyll cells of the leaf.**

**Solution:-**

Chloroplasts is the kind of plastids found in the mesophyll cells of the leaf.

**(c) The compound which stores energy in the cells.**

**Solution:-**

ATP (Adenosine triphosphate) stores energy in the cells.

**(d) The first form of food substance produced during photosynthesis.**

**Solution:-**

Glucose is the first form of food substance produced during photosynthesis.

**(e) The organisms that can be called "natural purifiers" of the air.**

**Solution:-**

Green plants are called natural purifiers of the air.

**(f) The source of carbon dioxide for aquatic plants.**

**Solution:-**

The carbon dioxide dissolved in water.

**(g) The part of chloroplast where the dark reaction of photosynthesis takes place.**

**Solution:-**

Stroma

**(h) The tissue that transports manufactured type of starch from leaves to all parts of the plants.**

**Solution:-**

Phloem is the tissue that transports manufactured type of starch from leaves to all parts of the plants.

### **C. SHORT ANSWER TYPE**

**1. Mention one difference between the following on the basis of what is given in**

brackets.

**(a) Respiration and photosynthesis (gas released)**

**Solution:-**

Respiration	Photosynthesis
All plants and animals, respire by oxidizing carbohydrates in their cells to produce energy and give out carbon dioxide into the atmosphere.	Green plants (producers) use carbon dioxide of the air to produce carbohydrates and release oxygen to the atmosphere.

**(b) Light and dark reactions (products formed)**

**Solution:-**

Light reaction	Dark reaction
Light reaction includes trapping of energy by chlorophyll, and this energy is used in splitting water molecules into hydrogen and oxygen (photolysis) and in producing ATP.	Dark reaction involves transfer of hydrogen from NADPH through a series of chemical reaction, to combine with CO <sub>2</sub> to produce C <sub>6</sub> H <sub>12</sub> O <sub>6</sub> by using energy from ATP.

**(c) Producers and consumers (mode of nutrition)**

**Solution:-**

Producers	Consumers
All green plants prepare their own food. Therefore, they are called autotrophs (self-nutrition).	Animals derive their food from plants either directly by eating their part, or indirectly by eating the plant-eater. Animals are heterotrophic (different nutrition)

**(d) Grass and grasshopper (mode of nutrition)**

**Solution:-**

Grass	Grasshopper
Grass is a producer. It prepare its own food by photosynthesis.	Grass is eaten up by the grasshopper.

**(e) Chlorophyll and chloroplast (part of plant cell)**

**Solution:-**

Chlorophyll	Chloroplast
Chlorophyll is the green colouring matter found in plants. It is contained in microscopic cell organelles called chloroplasts.	Chloroplasts are minute oval bodies bounded by a double membrane, and their interior contains closely packed flattened sacs arranged in piles lying in a colourless ground substance called stroma.

**2. Identify the false statements and rewrite them correctly by changing the first or last word only.**

**(a) Dark reaction of photosynthesis occurs during night time.**

**Solution:-**

False.

Dark reaction of photosynthesis occurs simultaneously with light reaction.

**(b) Immediate product of photosynthesis is glucose.**

**Solution:-**

True

**(c) Starch produced in a leaf remains stored in it for 2-3 weeks before it is used by other parts of the plant.**

**Solution:-**

False.

Starch produced in the leaf remains stored in it until the night before it is used by other parts of the plant.

**(d) Photosynthesis requires enzymes.**

**Solution:-**

True.

**(e) Green plants are consumers.**

**Solution:-**

False.

Green plants are producers.

**(f) Photosynthesis results in loss of dry weight of the plants.**

**Solution:-**

False.

Respiration results in loss of dry weight of the plants.

**(g) Photosynthesis stops at a temperature of about 35°C.**

**Solution:-**

False.

Photosynthesis stops at a temperature of about 40°C.

**(h) Photosynthesis occurs only in cells containing chloroplasts.**

**Solution:-**

True.

**(i) Green plants perform photosynthesis.**

**Solution:-**

True.

**(j) Algae are autotrophs.**

**Solution:-**

True.



**3. Fill in the blanks with the appropriate answer from the choices given in the brackets.**

**(a) The site of light reaction in the cells of a leaf is..... (cytoplasm, stroma, grana).**

**Solution:-**

The site of light reaction in the cells of a leaf is grana

**(b) The chemical substance used to test the presence of starch in the cell of a leaf is. .... (CaCl<sub>2</sub>, iodine solution, Benedict solution).**

**Solution:-**

The chemical substance used to test the presence of starch in the cell of a leaf is iodine solution.

**(c) Stroma is the ground substance in.....(cytoplasm, chloroplast, ribosomes).**

**Solution:-**

Stroma is the ground substance in chloroplast.

**(d) The dark reaction of photosynthesis is known as..... (Hill reaction, cyclic phosphorylation, Calvin cycle).**

**Solution:-**

The dark reaction of photosynthesis is known as Calvin cycle.

**(e) In the flowering plants, food is transported in the form of..... (sucrose, glucose, starch).**

**Solution:-**

In the flowering plants, food is transported in the form of Sucrose.

**4. Are the following statements true or false? Give reason in support of your answer.**

**(a) The rate of photosynthesis continues to rise as long as the intensity of light rises.**

**Solution:-**

False.

One would easily think that the rate of photosynthesis will increase with light intensity. To some extent, it is true. Photosynthesis increases with the light intensity up to a certain limit only, and then it gets stabilised at that point.

**(b) The outside atmospheric temperature has no effect on the rate of photosynthesis.**

**Solution:-**

False.

With the rise in temperature, the rate of photosynthesis rises. This rise occurs up to the optimum temperature of 35°C (maximum suitable temperature when the photosynthesis occurs best) after which it falls and stops above 40°C.

**(c) If you immerse a leaf intact on the plant in ice cold water, it will continue to photosynthesize in bright sunshine.**

**Solution:-**

False.

We know that temperature is an important factor for the rate of photosynthesis. Ice cold water will hamper the process of photosynthesis in the immersed leaf, even if there is sufficient sunshine.

**(d) Destarching of the leaves of a potted plant can occur only at night.**

**Solution:-**

False.

A plant used for experiment on photosynthesis should initially be placed in the dark for

24 to 48 hours to de-starch the leaves. During this period, all the starch will be removed from the leaves and stored in the storage organs. The leaves will not show the presence of starch.

**(e) The starting point of carbon cycle is the release of CO<sub>2</sub> by animals during respiration.**

**Solution:-**

False.

Carbon enters the atmosphere as carbon dioxide from respiration and combustion. Carbon dioxide is absorbed by producers to make glucose in photosynthesis. So, there is no starting point or ending point in the carbon cycle.

**(f) If a plant is kept in bright light all the 24 hours for a few days, the dark reaction (biosynthetic phase) will fail to occur.**

**Solution:-**

False.

If a plant is kept in bright light all the 24 hours for a few days, the dark reaction (biosynthetic phase) will continue to occur because these set of reactions are independent of light and it occurs simultaneously with the light dependent reaction.

**(g) Photosynthesis is considered as a process supporting all life on earth.**

**Solution:-**

True.

Photosynthesis is ultimately the source of energy and food for all living being directly for plants and indirectly for animals and humans who eat the plants or the plant eating animals.

**5. Given below are five terms. Rewrite the terms in the correct order so as to be in logical sequence with regard to photosynthesis: (i) water molecules, (ii) oxygen, (iii) grana, (iv) hydrogen and hydroxyl ions, (v) photons.**

**Solution:-**

The correct order in logical sequence with regard to photosynthesis be, (v) photons, (iii) grana, (i) water molecules, (iv) hydrogen and hydroxyl ions, (ii) oxygen.

**6. State any four differences between photosynthesis and respiration.**

**Solution:-**

Photosynthesis	Respiration
(1) Photosynthesis occurs only in green plants and photosynthetic bacteria.	(1) Respiration occurs in all living organisms.
(2) Photosynthesis is dependent on light.	(2) Respiration is not dependent on light.
(3) Photosynthesis consists of two stages light reaction and dark reaction.	(3) Respiration consists of two stages, they are inhalation and exhalation.
(4) The carbon dioxide is used and released in the process of photosynthesis.	(4) The oxygen is used and carbon dioxide is released in the process of respiration.

### 7. "Oxygen is a waste product of photosynthesis." Comment.

#### Solution:-

Photosynthesis is the only biological process which releases oxygen into the atmosphere. Oxygen supports all life on earth. No living being can remain alive without oxygen. Some of the oxygen may be used in respiration in the leaf cells (the phenomenon is called photorespiration), but the major portion of it is not required and it diffuse out into the atmosphere through the stomata. In a sense, even this oxygen is not a waste, because all organisms require it for their existence including the plants which require it at night. So, oxygen is not a waste of photosynthesis because all organisms require it for their existence including the plants.

### 8. Why is it necessary to place a plant in the dark before starting an experiment on photosynthesis? Explain.

#### Solution:-

A plant used for experiments on photosynthesis should initially be placed in the dark for 24 to 48 hours to destarch the leaves. During this period, all the starch will be removed from the leaves and stored in the storage organs. The leaves will not show the presence of starch. In every period of twenty-four hours, plants are subjected to a regular cycle change in light intensity, and the rate of photosynthesis increases from dawn to midday and declines as dusk approaches. In darkness, respiration alone is responsible for changes in the gaseous composition of plant's surrounding atmosphere.

### 9. Why is it not possible to demonstrate respiration in a green plant kept in sunlight?

#### Solution:-

It is not possible to demonstrate respiration in green plants kept in sunlight because during day time plants are undergoing photosynthesis. Photosynthesis requires  $\text{CO}_2$  as the substrate in green plants. It takes place in the presence of light.  $\text{CO}_2$  is also the product of respiration. During this time oxygen is given out by plants as waste product

and they take carbon dioxide to make food their own food. We know that the oxygen is consumed during respiration in plants hence it cannot be demonstrated at the daytime, as plants carry out respiration at night.

**10. Most leaves have the upper surface more green and shiny than the lower one.**

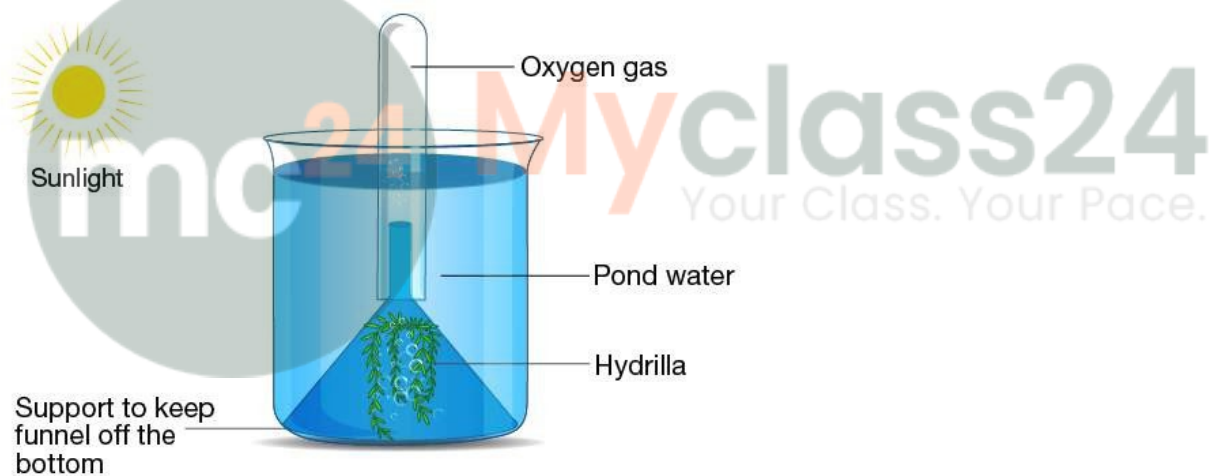
**Why?**

**Solution:-**

Most leaves have the upper surface more green and shiny than the lower one because chloroplasts and stomata are concentrated in the upper layers of the leaf which helps cells to trap the sunlight quickly. The upper surface is thicker than the lower surface and also the epidermis is covered by a waxy, waterproof layer of cuticle.

**11. How would you demonstrate that green plants release oxygen when exposed to light?**

**Solution:-**



(a) Place some water plants (Elodea or Hydrilla) in a beaker containing pond water and cover them by a short-stemmed funnel.

(b) Invert a test-tube full of water over the stem of the funnel. (Ensure that the level of water in the beaker is above the level of stem of the inverted funnel).

(c) Place the apparatus in the sun for a few hours. Bubbles of the gas will collect in the test-tube.

(d) Test the gas in the test-tube. A glowing splinter bursts into flame which shows the presence of oxygen.

**12. Describe the main chemical changes which occur during photosynthesis in:**

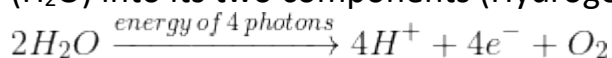
**(i) Light reaction****(ii) Dark reaction****Solution:-**

(i) In this phase, light plays the key role. A series of chemical reactions occur in very quick succession, initiated by light and therefore, the phase is called the photochemical phase.

The light reaction occurs in two main steps.

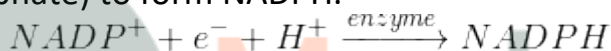
Step 1:- Activation of chlorophyll. The chlorophyll on exposure to light energy becomes activated by absorbing photons.

Step 2:- Splitting of water. The absorbed energy is used in splitting the water molecule ( $H_2O$ ) into its two components (Hydrogen and Oxygen) and releasing electrons.

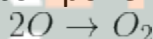


The reaction is known as photolysis.

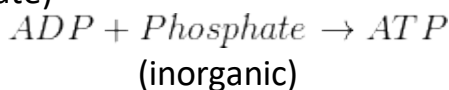
(a) The hydrogen ions ( $H^+$ ) are picked up by a compound NADP (Nicotinamide adenine dinucleotide phosphate) to form NADPH.



(b) The oxygen (O) component is given out as molecular oxygen ( $O_2$ ).



(c) The electrons ( $e^-$ ) are used in converting ADP (adenosine diphosphate) into energy-rich compound ATP (adenosine triphosphate) by adding one phosphate group  $P_i$  (inorganic phosphate)



(ii) The reaction is the phase do not require light energy, and occur simultaneously with the light reaction (time gap between the two being less than even one-thousandth of a second)

**13. Complete the following food chains by writing the names of appropriate organisms in the blanks:**

**(i) Grass → ..... Snake →.....**

**Solution:-**

Grass → Rat → Snake → Hawk

(ii)..... → Mouse ..... → Peacock

**Solution:-**

Corn → Mouse → Snake → Peacock

**14. How do non-green plants such as fungi and bacteria obtain their nourishment?**

**Solution:-**

Non-green plants such as fungi and bacteria obtain their nourishment from decaying organic matter in their environment. This matter comes from dead animals and plants, which in their own turn were dependent on photosynthesis.

**15. All life owes its existence to chlorophyll. Give reason.**

**Solution:-**

Chlorophyll is the green colouring matter found in plants. It is contained in microscopic cell organelles called chloroplasts. Chloroplasts are minute oval bodies bounded by a double membrane, and their interior contains closely packed flattened sacs (thylakoids) arranged in piles (grana) lying in a colourless ground substance called stroma. Ordinarily, there may be 40-50 chloroplasts in a cell. The pigment chlorophyll is contained in the walls of thylakoids. It is a highly complex substance, composed of carbon, hydrogen, oxygen, nitrogen and magnesium. Chloroplasts are mainly contained in the mesophyll cells located between the upper epidermis and the lower epidermis of leaves. These are also found in the guard cells of stomata and in the outer layers of young green stems.

**16. Complete the following by filling the blanks 1 to 5 with appropriate words/ terms/ phrases:**

To test the leaf for starch, the leaf is boiled in water to (1).....It is next boiled in methylated spirit to (2)..... The leaf is placed in warm water to soften it. It is then placed in a dish and (3)..... solution is added. The region, which contains starch, turns (4) .....and the region, which does not contain starch, turns (5) .....

**Solution:-**

To test the leaf for starch, the leaf is boiled in water to kill the cells. It is next boiled in methylated spirit to remove chlorophyll. The leaf is placed in warm water to soften it. It is then placed in a dish and iodine solution is added. The region, which contains starch, turns blue black colour and the region, which does not contain starch, turns brown colour.

**D. STRUCTURED/APPLICATION/SKILL TYPE**

**1. A candidate studied the importance of certain factors in photosynthesis. He took a potted plant and kept in the dark for over 24 hours. In the early hours of the next morning, he covered one of the leaves with black paper in the centre only. Then he placed the plant in sunlight for a few hours and tested the leaf which was covered with black paper for starch.**

**a. What aspect of photosynthesis was being investigated?**

**Solution:-**

To study the effect of sunlight on the rate of photosynthesis.

**b. Is there any control in this experiment? If so, state it.**

**Solution:-**

Yes, in the potted plant uncovered portion of the leaf is used as a control.

**c. Why was the plant kept in the dark before the experiment?**

**Solution:-**

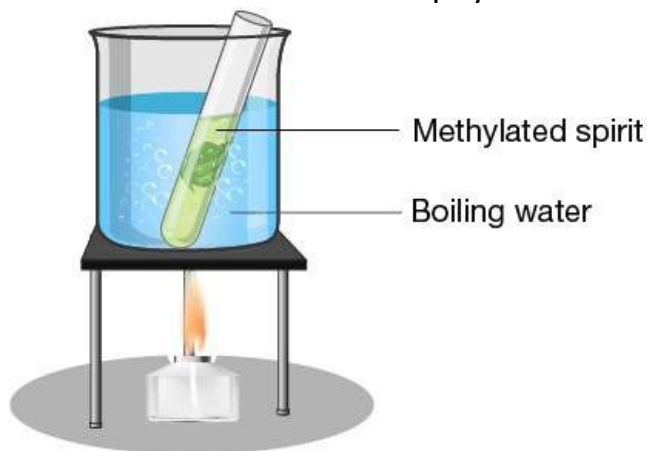
A plant used for experiment on photosynthesis should initially be placed in the dark for 24 to 48 hours to destarch the leaves. During this period, all the starch will be removed from the leaves and stored in the storage organs. The leaves will not show the presence of starch.

**d. Describe step by step, how the candidate proceeded to test the leaf for the presence of starch?**

**Solution:-**

(a) The candidate dipped the leaf in boiling water for a minute to kill the cells.

(b) Then boiled the leaf in methylated spirit over a water bath till it becomes pale-white due to the removal of chlorophyll. The leaf now becomes hard and brittle.



(c) Then place it again in hot water to soften it.

(d) Spread the leaf in a dish and pour iodine solution on it. The presence of starch will be

indicated by a blue-black colour. A leaf without starch will show brown colouration.

**2. Photosynthesis in green plants is directly and indirectly dependent on so many plant structures. Explain briefly the role of the following structures in this process.**

**(a) Guard cells**

**(b) Cuticle**

**(c) Mesophyll cells**

**(d) Xylem tissue in the leaf veins**

**(e) Phloem tissue in Leaf Veins**

**(f) Stomata**

**Solution:-**

(a) Guard cells are cells surrounding each stoma. They help to regulate the rate of transpiration by opening and closing the stomata.

(b) Cuticle are transparent and water proof to allow light to enter freely.

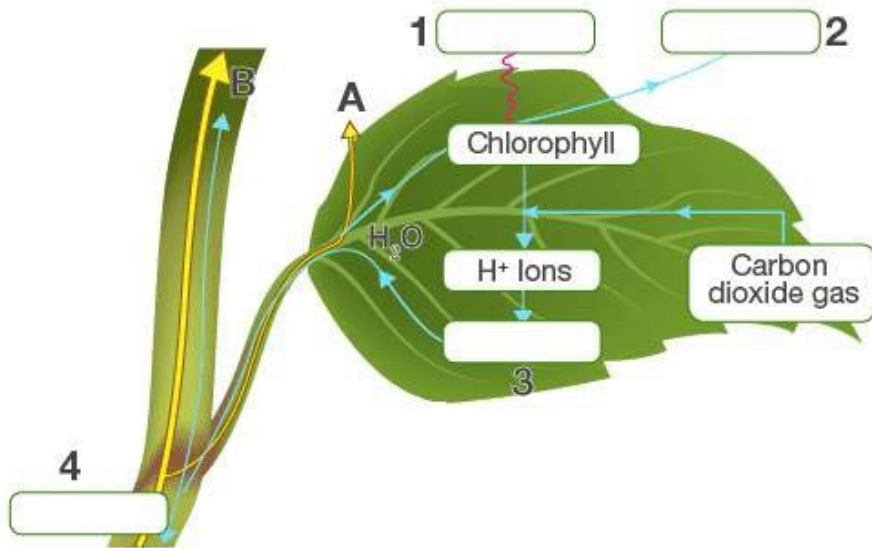
(c) Mesophyll cells (both palisade and spongy) in a leaf are the principal centers of the photosynthesis. During day time, when sunlight falls on the leaf, the light energy is trapped by the chlorophyll of the upper layers of mesophyll, especially the palisade cells.

(d) The xylem consists of tracheids and vessels, which transport water and minerals to the leaves.

(e) The phloem transports the photosynthetic products from the leaf to the other parts of the plant. A single vascular bundle, no matter how large or small, always contains both xylem and phloem tissues.

(f) Stomata are minute opening occurring in large numbers on the lower surface of a leaf. The main function of the stomata is to let in  $\text{CO}_2$  from the atmosphere for photosynthesis.

**3. Given below is a schematic diagram to illustrate some aspects of photosynthesis.**



(a) Fill up the gaps, in blank spaces (1-4), by writing the names of the correct items.

**Solution:-**

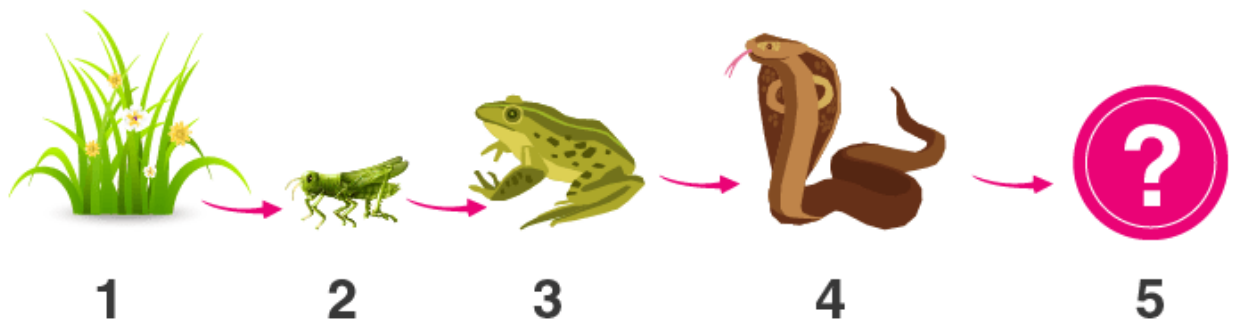
- (1) Sunlight
- (2) Oxygen
- (3) Glucose
- (4) Water

(b) What phenomenon do the thick arrows A and B indicate respectively?

**Solution:-**

Arrow A indicates Transpiration and arrow B indicates the ascent of sap.

4. Given below is the representation of a certain phenomenon in nature. With four organisms 1 – 4.



(a) Name the phenomenon represented.

**Solution:-**

The phenomenon is represented above is food chain.

**(b) Name any one organism that could be shown at No.5.**

**Solution:-**

The organism that could be shown at No.5 is Hawk.

**(c) Name the biological process which was the starting point of the whole chain.**

**Solution:-**

Photosynthesis is the biological process which was the starting point of the whole chain.

**(d) Name one natural element which all the organisms 2-4 and even 5 are getting from No. 1 for their survival.**

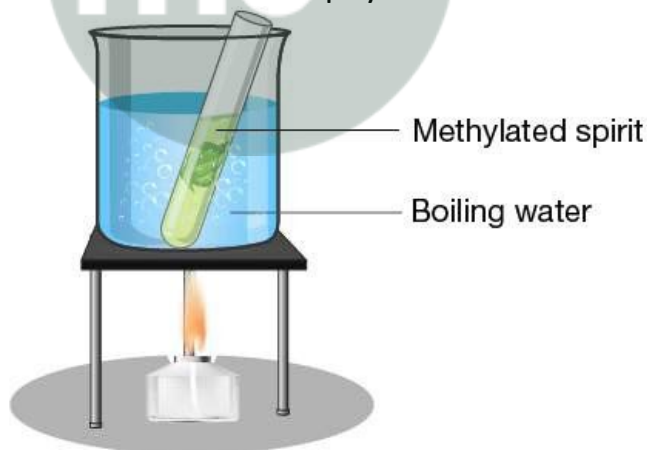
Oxygen is the element which all the organisms 2-4 and even 5 are getting from No. 1 for their survival.

**5. Enumerate the steps involved in testing a green leaf for the presence of starch.**

**Solution:-**

(a) Dip the leaf in boiling water for a minute to kill the cells.

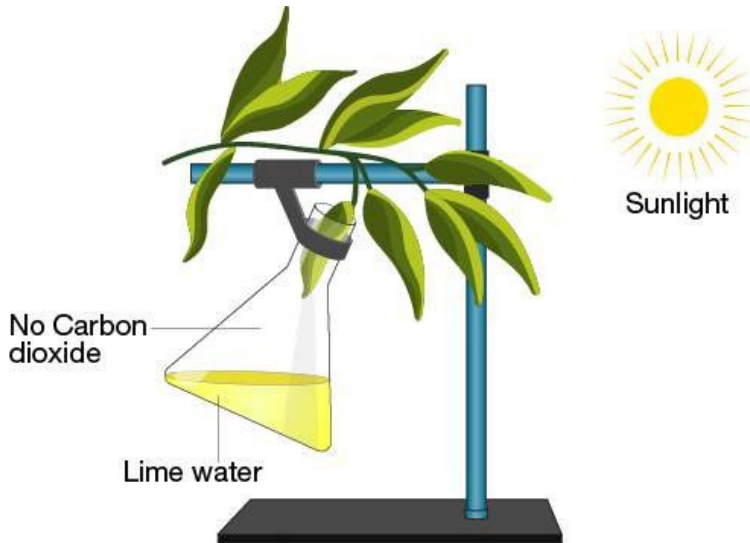
(b) Boil the leaf in methylated spirit over a water bath till it becomes pale-white due to the removal of chlorophyll. The leaf now becomes hard and brittle.



(c) Then place it again in hot water to soften it.

(d) Spread the leaf in a dish and pour iodine solution on it. The presence of starch will be indicated by a blue-black colour. A leaf without starch will show brown colouration.

**6. Given below is the diagram of an experimental set-up:**



**(a) What is objective of this experiment?**

**Solution:-**

The main aim of this experiment is to describe the importance of the carbon dioxide in the photosynthesis.

**(b) Will it work satisfactorily? Give reason.**

**Solution:-**

No, the experiment will not work satisfactorily because, as mentioned in the above statement carbon dioxide is very important in the photosynthesis. This experiment contains lime water it does not absorb  $\text{CO}_2$ .

**(c) What alteration(s) will you make in it for obtaining expected result?**

**Solution:-**

To obtaining expected result replace the lime water from potassium hydroxide because it absorbs carbon dioxide.

**(d) Would you take any step before starting the experiment? Describe this step and explain its necessity.**

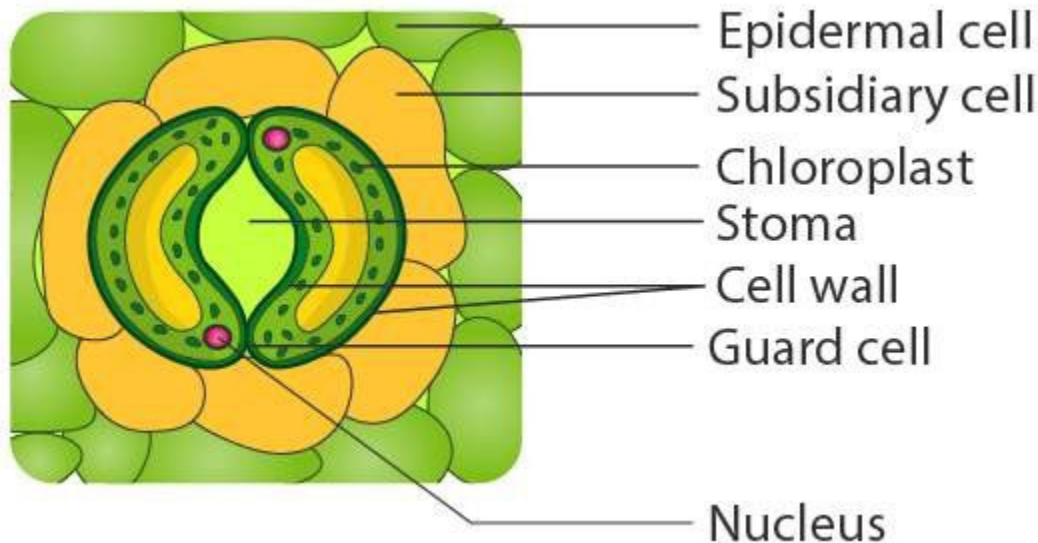
**Solution:-**

Yes, we have to take step before starting the experiment. A plant used for experiment on photosynthesis should initially be placed in the dark for 24 to 48 hours to destarch the leaves. During this period, all the starch will be removed from the leaves and stored in the storage organs. The leaves will not show the presence of starch.

**7. Draw a neat diagram of the stomatal apparatus found in the epidermis of leaves**

and label the Stoma, Guard cells, Chloroplast, Epidermal cells, Cell wall and Nucleus.

**Solution:-**



**8. A potted plant was taken in order to prove a factor necessary for photosynthesis. The potted plant was kept in the dark for 24 hours. One of the leaves was covered with black paper in the centre. The potted plant was then placed in sunlight for a few hours.**

**(a) What aspect of photosynthesis was being tested?**

**Solution:-**

To study the effect of sunlight on the rate of photosynthesis.

**(b) Why was the plant placed in the dark before beginning the experiment?**

**Solution:-**

A plant used for experiment on photosynthesis should initially be placed in the dark for 24 to 48 hours to destarch the leaves. During this period, all the starch will be removed from the leaves and stored in the storage organs. The leaves will not show the presence of starch.

**(c) During the starch test, why was the leaf**

**(1) boiled in water**

**(2) boiled in methylated spirit**

**Solution:-**

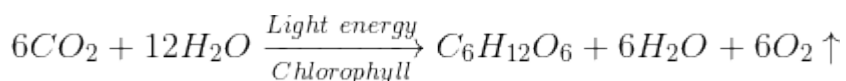
(1) The leaf is boiled in water for a minute to kill the cells.

(2) Boil the leaf in methylated spirit over a water bath till it becomes pale-white due to

the removal of chlorophyll. The leaf now becomes hard and brittle.

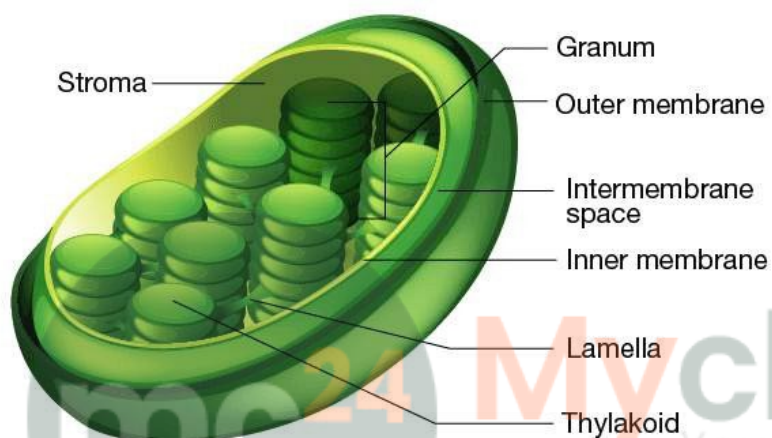
**(d) Write a balanced chemical equation to represent the process of photosynthesis.**

**Solution:-**

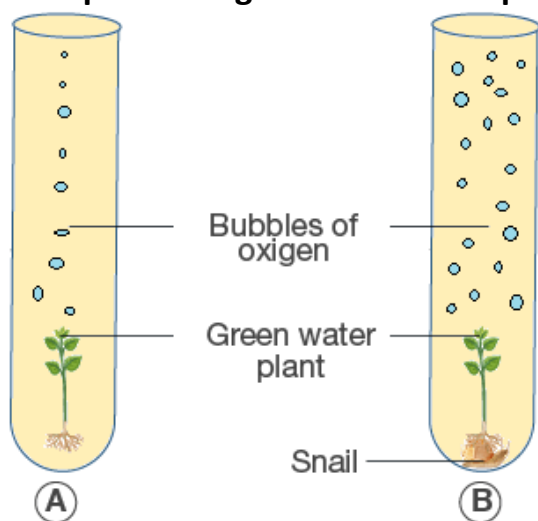


**(e) Draw a neat diagram of a chloroplast and label its parts.**

**Solution:-**



**9. The diagram below shows two test-tubes A and B. Test-tube A contains a green water plant. Test-tube B contains both a green water plant and a snail. Both test-tubes are kept in sunlight. Answer the questions that follow:**



**(a) Name the physiological process that releases the bubbles of oxygen.**

**Solution:-**

Photosynthesis is the physiological process that releases the bubbles of oxygen.

**(b) Explain the physiological process as mentioned above in (a).**

**Solution:-**

Photosynthesis is an important activity of all green plants which are able to synthesis food from carbon dioxide and water in the presence of chlorophyll and light energy. The essential chemical steps in this process are the same in all green plants.

**(c) What is the purpose of keeping a snail in test-tube B?**

**Solution:-**

The purpose of keeping a snail in test-tube 'B' is to increase the rate of photosynthesis by increasing the concentration of carbon dioxide.

**(d) Why does test-tube B have more bubbles of oxygen?**

**Solution:-**

As mentioned in the above answer, the plant in test tube B has more concentration of CO<sub>2</sub> available because the snail releases CO<sub>2</sub> during respiration. This increases the rate of photosynthesis in the plant placed in test tube B which leads to the release of more amount of oxygen.

**(e) Give an example of a water plant that can be used in the above experiment.**

**Solution:-**

Elodea or Hydrilla

**(f) Write the overall chemical equation for the above process.**

**Solution:-**

