



Grade 11

Science

Unit : 02 - Photosynthesis

MCQ Questions

- (1) Which of the following statements is false regarding photosynthesis?
- 1) CO₂ gas is produced as a by-product of photosynthesis.
 - 2) Photosynthesis can be done naturally.
 - 3) Solar energy is essential for photosynthesis.
 - 4) Light energy, water, CO₂ and chlorophyll are required for photosynthesis.
- (2) What is the food type that translocates to storing organs.
- 1) Sucrose 2) Glucose 3) Starch 4) Cellulose
- (3) What is the by product of photosynthesis?
- 1) Carbon dioxide 2) Oxygen 3) Glucose 4) Sucrose
- (4) Into which energy that solar energy is converted to, during photosynthesis?
- 1) Light energy 2) Chemical energy
 - 3) Heat energy 4) Potential energy
- (5) What is the transportation method of energy of soil water into the root hairs.
- 1) Diffusion 2) Osmosis 3) Active absorption 4) mass flow
- (6) When a leaf is tested for starch, plant should be taken after keeping it in dark for 48 hours. The reason for this is that,
- 1) To destroy cells in the leaves.
 - 2) To dissolve chlorophyll in the leaves.
 - 3) To remove stored starch completely from the leaves.
 - 4) To provide extra CO₂ to the leaves.
- (7) Which of the following statements is correct regarding photosynthesis?
- 1) CO₂ diffuses into leaf through veins.
 - 2) Water in the soil is absorbed through root hairs by osmosis.
 - 3) Photosynthesis involves to reduce atmospheric O₂ level.
 - 4) CO₂ and sunlight are the raw materials needed for photosynthesis.

- (8) The byproduct of photosynthesis, O₂ is diffused in to the atmosphere through,
 1) Veins 2) Stomata 3) Root hairs 4) Buds
- (9) What is the tissue involved in transporting products in photosynthesis to storing organs?
 1) Sclerenchyma 2) Xylem 3) Phloem 4) Collenchyma
- (10) Which of the following is not an importance of photosynthesis?
 1) Light energy is converted to chemical energy.
 2) Helps to maintain O₂ and CO₂ balance in the atmosphere.
 3) Helps to maintain the carbon cycle.
 4) CO₂ is accumulated to the environment by photosynthesis.

Structured Essay Questions

- (1) You are assigned to show experimentally that CO₂ is required for photosynthesis.
 i) You are provided with the equipment and materials given below for the apparatus set up relevant to the experiment.
 Draw a rough sketch of the set – up that you make using the given equipment.

Potted plant, Two polythene bags, KOH solution, Water

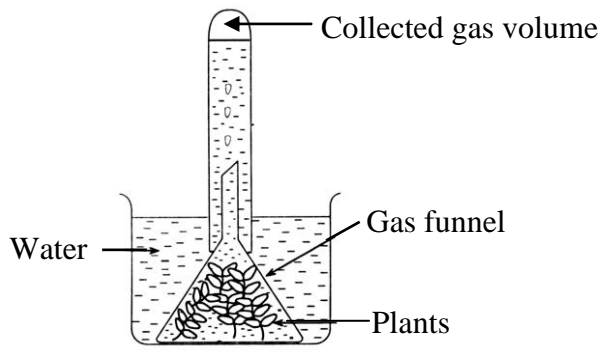


- ii) Write an observation that can made when the leaves tested for starch.

- iii) Write the balanced chemical equation for the photosynthesis process.

- iv) Put "✓" or "×" for the given statements.
- | | |
|---|--------|
| a) Photosynthesis takes place in leaves only. | () |
| b) The main product of photosynthesis is oxygen. | () |
| c) Lavoisier is the first scientist who showed that oxygen diffuse from green plants in the presence of sunlight. | () |

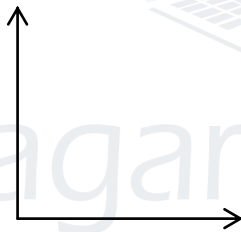
- (2) i) The diagram shown below is a set up used to study the influence of light intensity under different environmental conditions on the rate photosynthesis.



The reading were stated below.

Light intensity	In dark	In a shady place	Low light intensity	High light intensity
Light intensity	0	1	2	3
Volume of gas evolved during 30 min.	0	2	4	6

- ii) Draw a graph using the light intensity for the axis x and the volume of the gas evolved for the axis y.



- iii) Explain the rate of changes of photosynthesis with intensity. According to the data and the graph drawn earlier.

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- iv) Name a plant that can be used to put inside the funnel.

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- v) Name two factors essential for photosynthesis except light.

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- vi) a) The gas evolved here is collected inside the test tube higher the water level.
 State two factors that affect for it.

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b) What is the gas that collected inside the test tube?

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c) What is the laboratory experiment that you do to identify the above gas?

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d) Write the energy transformation takes place in the process of photosynthesis.

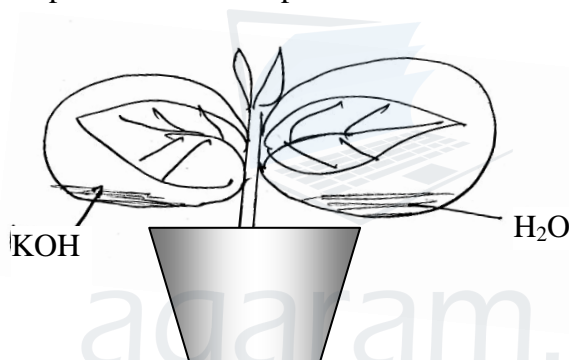
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e) Write the balanced equation for the above reaction.

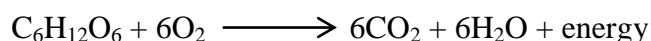
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Essay Questions

- (1) A) Plants are very important for the existence of the living world. Following set up indicate main biological process related to plants.



- i) What is the main objective of this experiment?
 - ii) Mention one precaution that should be followed before start the above experiment.
 - iii) Explain the reason for doing the above step.
 - iv) How can you confirm that the above objective of experiment was succeeded?
 - v) What are the observation that can be obtained from the above activity?
- B) The chemical process related to respiration is given below.



- i) Calculate number of glucose moles in 45g of glucose.
- ii) What is the mass of CO₂ that can be obtained by burning 90g of glucose?

- (2) The steps of an experiment designed by a student to identify oxygen gas produced during the photosynthesis were as follows.
- 1) Water was boiled up to the boiling point in a beaker.
 - 2) A small amount of NaHCO_3 was added to the beaker.
 - 3) Inserted some hydrilla plants in to the beaker and cover it by using funnel and test tube was kept downwards on the neck of the funnel.
 - 4) Gas was collected in the test tube.
 - 5) The gas collected in the test tube was tested using burning splinter.
- A) i) Why it is needed to boil the water in the beaker?
ii) Why it is needed to cool up water to the room temperature?
iii) Why did he add some sodium carbonate to water in the beaker?
iv) What is the observation of glowing splinter if the gas collected in the test tube was oxygen?
v) What is the reason of selecting a plant like hydrilla for this experiment?
- B) i) Write the balanced chemical equation for the process when a plant leaf exposes to the sunlight.
ii) Write the steps of simple experiment could be used to confirm that the plant has not been produced food at the yellow colour plant leaves.

agaram.lk