*** Choose the correct alternative from those given below each questions** [36]

1. A potted plant is kept in sunlight but inside a sealed glass chamber. After some time, moisture is seen on the inner walls of the chamber.
   What could be the reason for this?
   (A) Water is released by the plant during photosynthesis
   (B) Excess water is absorbed from the air
   (C) The plant is performing transpiration
   (D) The plant is absorbing moisture through stomata

   Ans. : (C) The plant is performing transpiration

2. After conducting the starch test, a leaf shows no blue-black colour even though it was green and placed in sunlight. What is the most likely reason?
   (A) The leaf lacked chlorophyll
   (B) The leaf was not destarched properly before the experiment
   (C) The plant was kept in the dark for two days
   (D) Caustic soda was used during the test

   Ans. : (B) The leaf was not destarched properly before the experiment

3. A plant was kept in sunlight but its roots were removed and the stem was placed in dry cotton. After three days, the plant wilted. Which conclusion is most valid?
   (A) Sunlight alone is enough for photosynthesis
   (B) Roots are essential to absorb carbon dioxide
   (C) Roots are essential to absorb water and minerals
   (D) Dry cotton blocks sunlight

   Ans. : (C) Roots are essential to absorb water and minerals

4. Choose the correct order of processes that lead to food formation and storage in plants:
   (A) Sunlight → Glucose → Chlorophyll → Starch
   (B) Chlorophyll → Carbon dioxide → Sunlight → Energy
   (C) Carbon dioxide + Water → Glucose → Starch
   (D) Water + Starch → Glucose → Energy

   Ans. : (C) Carbon dioxide + Water → Glucose → Starch

5. A student observes that red ink travels up a plant stem. What should they infer?
   (A) Phloem is transporting coloured water
   (B) Capillaries in the air are pulling water

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(C) Xylem transports water upwards from roots

(D) Red ink is naturally attracted to leaves

Ans. : (C) Xylem transports water upwards from roots

6. A variegated leaf (green and white patches) was tested for starch after being placed in sunlight. The green parts turned blue-black, the white parts did not. What conclusion is valid?

(A) Only white parts can store food

(B) Chlorophyll is not necessary for starch formation

(C) Chlorophyll is necessary for starch formation

(D) White parts reflect iodine

Ans. : (C) Chlorophyll is necessary for starch formation

7. In a science fair, a student places a plant inside a sealed bottle and keeps it in sunlight. After a few days, the plant is still green and healthy. What explains this phenomenon best?

(A) Photosynthesis and respiration are balanced inside

(B) The plant does not need air

(C) Oxygen outside the bottle keeps the plant alive

(D) Plants do not require light once grown

Ans.: (A) Photosynthesis and respiration are balanced inside

8. Which of the following is not a function of stomata?

(A) Allowing carbon dioxide intake

(B) Releasing oxygen

(C) Absorbing minerals

(D) Facilitating transpiration

Ans. : (C) Absorbing minerals

9. In an experiment, caustic soda is kept inside a bottle along with a leaf. The leaf does not turn blue-black after the starch test. What does this prove?

(A) Sunlight is harmful for starch formation

(B) Carbon dioxide is necessary for photosynthesis

(C) Alcohol removed the starch

(D) Caustic soda produces oxygen

Ans. : (B) Carbon dioxide is necessary for photosynthesis

10. A tree has its leaves on the topmost branches only. How does food reach the roots?

(A) Roots absorb food from the soil

(B) Xylem carries food downward

(C) Phloem transports food from leaves to roots

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(D) Photosynthesis occurs in roots too

Ans. : (C) Phloem transports food from leaves to roots

11. Which pigment is responsible for the green colour of leaves?

(A) Carotene (B) Chlorophyll (C) Xanthophyll (D) Anthocyanin

Ans. : (B) Chlorophyll

12. The food in plants is stored mainly in the form of:

(A) Protein (B) Fat (C) Starch (D) Vitamins

Ans. : (C) Starch

13. Which component is not required for photosynthesis?

(A) Oxygen (B) Sunlight (C) Water (D) Carbon dioxide

Ans.: (A) Oxygen

14. The word equation for respiration is:

(A) Water + Carbon dioxide $\rightarrow$ Glucose + Oxygen

(B) Glucose + Oxygen $\rightarrow$ Carbon dioxide + Water + Energy

(C) Glucose + Oxygen $\rightarrow$ Starch

(D) Carbon dioxide + Water $\rightarrow$ Energy + Glucose

Ans. : (B) Glucose + Oxygen $\rightarrow$ Carbon dioxide + Water + Energy

15. The oxygen released in photosynthesis comes from:

(A) Air (B) Soil (C) Water (D) Chlorophyll

Ans. : (C) Water

16. Which experiment proves that sunlight is necessary for photosynthesis?

(A) Stomata observation

(B) Lime water test

(C) Covered and uncovered leaf iodine test

(D) Red ink transport test

Ans. : (C) Covered and uncovered leaf iodine test

17. The part of the plant responsible for exchanging gases is:

(A) Phloem (B) Xylem (C) Roots (D) Stomata

Ans. : (D) Stomata

18. Which organelle helps in photosynthesis?

(A) Mitochondria (B) Chloroplast (C) Ribosome (D) Nucleus

Ans. : (B) Chloroplast

19. Which of the following proves that plants respire?

(A) Use of caustic soda in photosynthesis experiment

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(B) Red ink movement

(C) Lime water turning milky in germinating seed set-up

(D) Oxygen release in sunlight

Ans. : (C) Lime water turning milky in germinating seed set-up

20. Which scientist worked extensively on plant respiration?

(A) Jagdish Chandra Bose (B) Rustom Dastur

(C) Kamala Sohonie (D) C.V. Raman

Ans. : (B) Rustom Dastur

21. A leaf shows no colour change when iodine is added. What does this mean?

(A) Leaf has too much starch. (B) Leaf has no chlorophyll.

(C) Starch is present. (D) Starch is not present.

Ans. : (D) Starch is not present.

22. Which gas is essential for photosynthesis in plants?

(A) Oxygen (B) Nitrogen (C) Carbon dioxide (D) Hydrogen

Ans. : (C) Carbon dioxide

23. During respiration, glucose is broken down in the presence of _____.

(A) Carbon dioxide (B) Oxygen (C) Hydrogen (D) Nitrogen

Ans. : (B) Oxygen

24. Which of the following is known as the 'Food factories' of plants?

(A) Roots (B) Stem (C) Leaves (D) Flower

Ans. : (C) Leaves

25. Which of the following is used to test the presence of starch in a leaf?

(A) Alcohol (B) Iodine solution (C) Water (D) Chlorophyll

Ans. : (B) Iodine solution

26. What colour change indicates the presence of starch when iodine is added to a leaf?

(A) Red to yellow (B) Blue to green (C) Blue-black (D) Yellow to red

Ans. : (C) Blue-black

27. Why do non-green parts of a leaf not produce starch?

(A) They do not get water. (B) They do not have chlorophyll.

(C) They are too small. (D) They do not get air.

Ans. : (B) They do not have chlorophyll.

28. Which of the following raw materials is available in the air for photosynthesis?

(A) Oxygen (B) Carbon dioxide (C) Nitrogen (D) Hydrogen

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Ans. : (B) Carbon dioxide

29. Which of the following is the primary site for photosynthesis?

(A) Flower (B) Root (C) Stem (D) Leaf

Ans. : (D) Leaf

30. Which gas is released during photosynthesis?

(A) Oxygen (B) Carbon dioxide (C) Stomata (D) Chlorophyll

Ans.: (A) Oxygen

31. During photosynthesis, food is produced in the form of ____.

(A) starch (B) caustic soda (C) stomata (D) glucose

Ans. : (D) glucose

32. When we observe the lower surface of a leaf through a magnifying lens we see numerous small openings. Which of the following is the term given to such openings?

(A) Stomata (B) Lamina (C) Midrib (D) Veins

Ans.: (A) Stomata

33. Water and minerals are transported from roots to other parts of the plant by _____ .

(A) phloem (B) xylem (C) chlorophyll (D) stomata

Ans. : (B) xylem

34. The process by which plants break down glucose and release energy is called

(A) respiration (B) photosynthesis (C) transportation (D) food factory

Ans.: (A) respiration

35. In the absence of which of the following, will photosynthesis not occur in leaves?

(A) Guard cells (B) Chlorophyll

(C) Vacuole (D) Space between cells

Ans. : (B) Chlorophyll

36.

Column I	Column II
1. Oxygen	(A) Releases energy from food
2. Glucose	(B) By-product of photosynthesis
3. Sunlight	(C) Taken in during photosynthesis
4. Carbon dioxide	(D) Stored as starch in plants
5. Respiration	(E) Source of energy for photosynthesis

(A) (1)-(B), (2)-(D), (3)-(E), (4)-(C), (5)-(A) (B) (1)-(D), (2)-(A), (3)-(E), (4)-(C), (5)-(B)

(C) (1)-(B), (2)-(A), (3)-(D), (4)-(E), (5)-(C) (D) (1)-(D), (2)-(A), (3)-(B), (4)-(C), (5)-(E)

Ans. : self

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*** a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option.** [13]

37. Assertion (A): Water is required for photosynthesis.
Reason (R): Water is absorbed by leaves from the air.

(A) Both Assertion (A) and Reason (R) are true, and (R) is the correct explanation of (A).

(B) Both Assertion (A) and Reason (R) are true, but (R) is not the correct explanation of (A).

(C) (A) is true, but (R) is false.

(D) (A) is false, but (R) is true.

Ans. : (C) (A) is true, but (R) is false.

38. Assertion (A): Oxygen is released during photosynthesis.
Reason (R): It is a by-product of respiration in plants.

(A) Both Assertion (A) and Reason (R) are true, and (R) is the correct explanation of (A).

(B) Both Assertion (A) and Reason (R) are true, but (R) is not the correct explanation of (A).

(C) (A) is true, but (R) is false.

(D) (A) is false, but (R) is true.

Ans. : (C) (A) is true, but (R) is false.

39. Assertion (A): Germinating seeds release carbon dioxide.
Reason (R): They are capable of photosynthesis.

(A) Both Assertion (A) and Reason (R) are true, and (R) is the correct explanation of (A).

(B) Both Assertion (A) and Reason (R) are true, but (R) is not the correct explanation of (A).

(C) (A) is true, but (R) is false.

(D) (A) is false, but (R) is true.

Ans. : (C) (A) is true, but (R) is false.

40. Assertion (A): Transport in plants is essential for survival.
Reason (R): Roots alone perform all photosynthesis.

(A) Both Assertion (A) and Reason (R) are true, and (R) is the correct explanation of (A).

(B) Both Assertion (A) and Reason (R) are true, but (R) is not the correct explanation of (A).

(C) (A) is true, but (R) is false.

(D) (A) is false, but (R) is true.

Ans. : (C) (A) is true, but (R) is false.

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41. Assertion (A): Leaves are the food factories of plants.
Reason (R): They contain chlorophyll and perform photosynthesis.

(A) Both Assertion (A) and Reason (R) are true, and (R) is the correct explanation of (A).

(B) Both Assertion (A) and Reason (R) are true, but (R) is not the correct explanation of (A).

(C) (A) is true, but (R) is false.

(D) (A) is false, but (R) is true.

Ans.: (A) Both Assertion (A) and Reason (R) are true, and (R) is the correct explanation of (A).

42. Assertion (A): Respiration in plants occurs only in green parts.
Reason (R): Chloroplasts are found only in green parts.

(A) Both Assertion (A) and Reason (R) are true, and (R) is the correct explanation of (A).

(B) Both Assertion (A) and Reason (R) are true, but (R) is not the correct explanation of (A).

(C) (A) is true, but (R) is false.

(D) (A) is false, but (R) is true.

Ans. : (D) (A) is false, but (R) is true.

43. Assertion (A): Red ink experiment proves water transport.
Reason (R): Red ink dissolves starch in leaves.

(A) Both Assertion (A) and Reason (R) are true, and (R) is the correct explanation of (A).

(B) Both Assertion (A) and Reason (R) are true, but (R) is not the correct explanation of (A).

(C) (A) is true, but (R) is false.

(D) (A) is false, but (R) is true.

Ans. : (C) (A) is true, but (R) is false.

44. Assertion (A): Sunlight, water, carbon dioxide and chlorophyll are necessary photosynthesis.
Reason (R): During photosynthesis, plants produce food in the form of starch.

(A) Both A and R are true and R is the correct explanation of A.

(B) Both A and R are true but R is not the correct explanation of A.

(C) A is true but R is false.

(D) A is false but R is true.

Ans. : self

45. Assertion (A): Minerals and water present in the soil are absorbed by the roots and transported to leaves.

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Reason (R): Carbon dioxide from air is taken through stomata present on the surface of leaves.

(A) Both A and R are true and R is the correct explanation of A.

(B) Both A and R are true but R is not the correct explanation of A.

(C) A is true but R is false.

(D) A is false but R is true.

Ans. : (B) Both A and R are true but R is not the correct explanation of A.

46. Assertion (A): All parts of a plant, green or non-green, carry out respiration.
Reason (R): Water is broken down in the presence of oxygen during respiration.

(A) Both A and R are true and R is the correct explanation of A.

(B) Both A and R are true but R is not the correct explanation of A.

(C) A is true but R is false.

(D) A is false but R is true.

Ans. : (C) A is true but R is false.

47. Assertion (A): Green pigment found in the plant's leaves is called chlorophyll.
Reason (R): Chlorophyll is responsible for the green colour of the plants.

(A) Both A and R are true and R is the correct explanation of A.

(B) Both A and R are true but R is not the correct explanation of A.

(C) A is true but R is false.

(D) A is false but R is true.

Ans. : (B) Both A and R are true but R is not the correct explanation of A.

48. Assertion (A): The iodine solution indicates the presence of starch in the leaves.
Reason (R): The red-yellow colour confirms the presence of starch in the leaves.

(A) Both A and R are true and R is the correct explanation of A.

(B) Both A and R are true but R is not the correct explanation of A.

(C) A is true but R is false.

(D) A is false but R is true.

Ans. : (C) A is true but R is false.

49. Assertion (A): The final product of respiration is glucose.
Reason (R): The glucose ultimately gets converted into the starch.

(A) Both A and R are true and R is the correct explanation of A.

(B) Both A and R are true but R is not the correct explanation of A.

(C) A is true but R is false.

(D) A is false but R is true.

Ans. : (D) A is false but R is true.

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*** State Whether The Following Sentences Are True Or False.[1 Marks Each]** **[11]**

50. Photosynthesis takes place only in green parts of plants.

Ans. : true

51. Chlorophyll is a blue pigment present in leaves.

Ans. : false

52. Germinating seeds release carbon dioxide.

Ans. : true

53. Leaves have pores called lenticels for gas exchange.

Ans. : false

54. Oxygen is absorbed during photosynthesis.

Ans. : false

55. Plants do not require sunlight for their growth.

Ans. : false

56. Plants store food in the form of water.

Ans. : false

57. Chlorophyll helps in capturing sunlight.

Ans. : true

58. Non-green patches of leaf contain chlorophyll.

Ans. : false

59. Iodine solution is used to test the presence of starch.

Ans. : true

60. Sodium hydroxide solution absorbs oxygen.

Ans. : false

*** Fill In The Blanks With Correct Alternative.[1 Marks Each]** **[10]**

61. _____ is the process by which plants make food.

Ans. : Photosynthesis

62. _____ absorbs carbon dioxide from air in experiments.

Ans. : Caustic soda

63. _____ water confirms the presence of carbon dioxide.

Ans. : Lime

64. _____ pigment is essential for photosynthesis.

Ans. : Chlorophyll

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65. The plant structure that transports food is called _____ .

Ans. : phloem

66. Glucose is a simple _____ .

Ans. : carbohydrate

67. Lime water turns milky in the presence of _____ .

Ans. : carbon dioxide

68. Seeds produce carbon dioxide during _____ .

Ans. : respiration

69. The _____ transports water and minerals from roots to other parts of a plant.

Ans. : xylem

70. _____ help in the exchange of gases.

Ans. : Stomata

*** Answer The Following Questions In One Sentence.[1 Marks Each]** **[44]**

71. Name the process by which plants prepare their food.

Ans. : The process by which plants prepare their food is called Photosynthesis.

72. Write the word equation for photosynthesis.

Ans. : Carbon dioxide + Water $\xrightarrow[\text{Chlorophyll}]{\text{Sunlight}}$ Glucose + Oxygen

73. What colour does iodine turn in the presence of starch?

Ans. :
Iodine turns blue-black in the presence of starch.

74. What is the function of stomata?

Ans. : Stomata are like tiny doorways on the surface of leaves, and they have a very important job

75. Name the plant structure that carries water.

Ans. : Xylem carries water.

76. Write any one raw material required for photosynthesis.

Ans. : Carbon Dioxide

77. Which gas is taken in during respiration?

Ans. : During respiration, plants (and animals) take in oxygen.

78. What does the red ink experiment in twigs show?

Ans. : The red ink experiment with twigs demonstrates how water is transported in plants.

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79. Which gas from the air is essential in the process of food preparation in plants?

Ans. : Carbon dioxide is essential for the process of food preparation in plants.

80. X is broken down using Y to release carbon dioxide, Z, and energy.

$X + Y \rightarrow$ Carbon dioxide + Z + Energy

X, Y, and Z are three different components of the process. What do X, Y, and Z stand for?

Ans. : X – Glucose

Y – Oxygen

Z – Water

81.

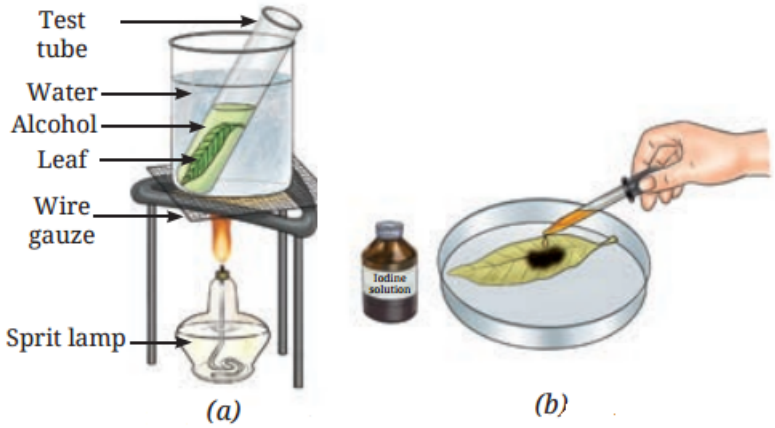
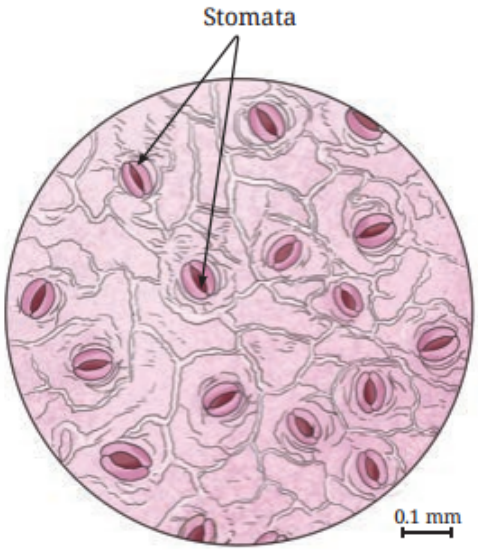


Fig. Starch test in a leaf, (a) Boiling set-up (b) Iodine test

Ans. : Observation and Conclusion: If the colour of the leaf changes to blue-black, we can conclude that starch is present in the leaf

82.



(i) What do you observe?

(ii) Do you notice tiny pores on the peel?

Ans. : (i)Tiny pores on the peel of the leaf.

(ii)Yes

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Conclusion :
These tiny pores are stomata. They are prsent on the surface of leaves, help in the exchange of gases.

83. What are nutrients?

Ans. : The components of food that are necessary for our body are called nutrients.

84. What are stomata?

Ans. : Tiny pores present on the lower surface of the leaves that helps in exchange of gases are called stomata.

85. Whether food is made in all parts of a plant or only in certain parts?

Ans. : The food is made mainly in leaves and some other parts of the plants that contain chlorophyll.

86. What are the food factories of plants?

Ans. : Leaves are the food factories of plants.

87. Name the process by which plants prepare their own food.

Ans. : Photosynthesis

88. Name the pigment that makes leaves green.

Ans. : Chlorophyll

89. What is the function of chlorophyll?

Ans. : Chlorophyll captures the energy of sunlight.

90. What are the end products of photosynthesis?

Ans. : Glucose and oxygen

91. Name the gas used in photosynthesis.

Ans. : Carbon dioxide

92. Name the gas released in photosynthesis.

Ans. : Oxygen

93. Name the chemical which is used to test the presence of starch in the leaf.

Ans. : Iodine solution

94. Photosynthesis requires chlorophyll and a few other raw materials. Add the missing raw materials to the list given below:
Water, minerals,

Ans. : (a) Sunlight/light energy,
(b) Carbon dioxide

95. Write the word equation of photosynthesis.

Ans. : Carbon dioxide + Water $\xrightarrow[\text{Chlorophyll}]{\text{Sunlight}}$ Glucose + Oxygen

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96. What are the important components required for the production of glucose in plants?

Ans. : Carbon dioxide, water, and sunlight are required for glucose production.

97. In what form is glucose stored in plants?

Ans. : Glucose is stored in plants in the form of starch.

98. Do all parts of the plant carry out respiration?

Ans. : Yes, all parts of the plant carry out respiration to release energy.

99. Do plants also respire like human beings?

Ans. : Yes, plants respire like human beings by breaking down glucose to release energy.

100. What is photosynthesis?

Ans. : Photosynthesis is the process by which green plants make their own food using carbon dioxide, water, and sunlight.

101. What is the role of stomata?

Ans. : Stomata help in the exchange of gases and transpiration in plants.

102. What is the role of chlorophyll?

Ans. : Chlorophyll captures sunlight to provide energy for photosynthesis.

103. Why alcohol should never be placed near a heat source directly?

Ans. : Alcohol is flammable and can catch fire if placed near a heat source.

104. What will happen if the plant is kept in the dark?

Ans. : The plant will not perform photosynthesis and starch will not be produced.

105. How do plants prepare their own food?

Ans. : Plants prepare their own food by the process of photosynthesis using water, carbon dioxide and sunlight.

106. Why our body cannot make food from carbon dioxide, water and minerals like plants do?

Ans. : Our body can have the raw materials required for the synthesis of food, but our body does not have chlorophyll which can capture the energy of sunlight.

107. How do water and minerals absorbed by roots reach the leaves?

Ans. : The water and minerals absorbed by the roots are transported to the leaves by the vessels present in xylem. They form a continuous passage or pipe line throughout the root, the stems, the branches and the leaves.

108. Without which process would life be impossible on earth?

Ans. : Photosynthesis

109. Which pigment makes green plants capable of utilising the solar energy?

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Ans. : Chlorophyll

110. Which gas is released during photosynthesis which is essential for life?

Ans. : Oxygen

111. Why some plant leaves appear red, violet or brown?

Ans. : This is so because they contain more coloured pigments than chlorophyll.

112. Name the solution that absorbs carbon dioxide from air.

Ans. : Sodium hydroxide solution

113. What was the name given to the sap of coconut palm on which Kamala Sohonie worked?

Ans. : Neera

114. Who studied the process of photosynthesis in India?

Ans. : Rustom Hormusji Dastur (1896-1961)

*** consists of questions of 2 marks each.** **[76]**

115. How do plants obtain carbon dioxide?

Ans. : They take in carbon dioxide from the air through small pores called stomata, which are mostly present on the surface of their leaves.Carbon dioxide diffuses into the leaves and is then used for photosynthesis, where it's converted into glucose and other organic compounds.

116. How do desert plants modify photosynthesis for survival?

Ans. : Desert plants have adapted to perform photosynthesis efficiently despite the harsh environmental conditions. Desert plants open their stomata at night to absorb carbon dioxide, reducing water loss during the hot daytime.The absorbed carbon dioxide is stored and used during the day for photosynthesis when sunlight is available.They use special acids to store carbon dioxide.

117. Describe how xylem and phloem function differently.

Ans. : → **Xylem** transports water and minerals upward from the roots to the rest of the plant.

→ **Pholem,** on the other hand, transports food (sugars) produced during photosynthesis both upwards and downwards from the leaves to other parts of the plant.

118. How can you test the presence of starch in a leaf?

Ans. : To test for starch, first boil the leaf to soften it and remove the chlorophyll by soaking it in hot alcohol. Then, add iodine solution to the leaf. If starch is present, the leaf will turn blue-black.

119. Why is it important to destarch a plant before an experiment?

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Ans. : Destarching removes any starch already present in the leaves, ensuring that any starch detected after the experiment is solely due to the experimental conditions.This ensures accurate results by providing a clear baseline, allowing you to observe and measure new starch production without interference from pre-existing starch.

120. Write the function of red pigments in photosynthetic plants.

Ans. : (1) Light Absorption: Red pigments can absorb light energy, particularly in the green-blue region of the spectrum, that chlorophyll might miss.
(2) Energy Transfer: The energy absorbed by these pigments can be transferred to chlorophyll, enhancing the overall efficiency of photosynthesis.

121. Why do some red-coloured leaves still perform photosynthesis?

Ans. : Red-colored leaves can still perform photosynthesis because:
They still contain chlorophyll, which is essential for photosynthesis. The red pigments (anthocyanins) simply mask the green chlorophyll.Although anthocyanins primarily provide the red color, chlorophyll still captures light energy for photosynthesis. The red pigments may even help in light absorption or protect the leaf from excess light.

122. Why do plants store food as starch instead of glucose?

Ans. : Starch is insoluble in water, which prevents it from disrupting the water balance within cells. If glucose were stored, it would dissolve and potentially cause osmotic stress.Starch is a large, compact molecule, allowing plants to store a significant amount of energy in a small space. Glucose molecules would take up more space and be less efficient for storage.

123. Imagine you grow two plants - one in a greenhouse and one outdoors. What variables will affect photosynthesis?

Ans. : Several variables will affect photosynthesis differently for plants grown in a greenhouse versus outdoors:
Sunlight is direct and intense outdoors, but it may be diffused or reduced in a greenhouse.Greenhouses can trap heat, leading to higher temperatures than outdoors.Greenhouses can sometimes have lower CO_2 levels compared to open outdoor environments, depending on ventilation.Both environments require adequate water, but humidity levels and watering schedules can vary, impacting the plant.

124. If stomata remain open all day, what impact would it have?

Ans. : If stomata remained open all day,Plants would lose too much water through transpiration, potentially leading to dehydration.Although continuous carbon dioxide intake could boost photosynthesis, the risk of dehydration would outweigh the benefits, ultimately harming the plant.

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125. Why is transporting food from leaves necessary in large trees?

Ans. : Transporting Food from Leaves is Necessary in Large Trees because Large trees have extensive structures (roots, branches, trunk) that require energy for growth and maintenance, which leaves provide through photosynthesis.Leaves produce food, but roots and interior cells cannot perform photosynthesis, so they depend on the transport of food (sugars) from the leaves to function and survive.

126. How does respiration help in plant growth and energy supply?

Ans. : Respiration is essential for plant growth and energy supply because:
→ It breaks down glucose to release energy, which is then used for various activities like growth, repair, and maintenance.
→ The energy produced helps in the development of new cells, tissues, and organs, supporting overall growth and health.

127. Design an eco-friendly experiment to show gas exchange in plants without harming them.

Ans. : self

128. Colour and label the parts of the plant where photosynthesis occurs.

Ans. : Photosynthesis primarily occurs in the leaves, which contain the pigment chlorophyll that captures sunlight. While leaves are the main sites, other green parts of the plant, such as stems, can also perform photosynthesis to a lesser extent.

129. Create a 3D model of stomata using clay and label its parts.

Ans. : self

130. How does sunlight contribute in the production of starch in plants?

Ans. : Sunlight is important for photosynthesis, the process by which plants make food. The chlorophyll present in the leaves helps in capturing sunlight. In the process of photosynthesis, plants use the absorbed sunlight, carbon dioxide, and water to make glucose. This glucose is later stored in the plant as starch.

131. Imagine a situation where all the organisms that carry out photosynthesis on the earth have disappeared. What would be the impact of this on living organisms?

Ans. : If all organisms that cany out photosynthesis disappeared, there would be no production of oxygen and food for other living organisms. This would disrupt the food chain, as plants provide food for herbivores and oxygen for respiration. Without plants, life on Earth would not be sustained.

132. A potato slice shows the presence of starch with iodine solution. Where does the starch in potatoes come from? Where is the food synthesised in the plant, and how does it reach the potato?

Ans. : The starch in potatoes comes from the glucose produced in the leaves during photosynthesis. Photosynthesis occurs in the leaves, where food is synthesised in

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the form of glucose. This glucose is then transported through the plant to the potato, where it is stored in the form of starch.

133. Does the broad and flat structure of leaves make plants more efficient for photosynthesis? Justify your answer.

Ans. : Yes, the broad and flat structure of leaves makes plants more efficient for photosynthesis. This shape increases the surface area, allowing more sunlight to be absorbed by the chlorophyll present in the leaves. It also helps in the exchange of gases through the stomata, thus enhancing the process of photosynthesis.

134. Photosynthesis and respiration are essential to maintain balance in nature. Discuss.

Ans. : Photosynthesis and respiration help maintain the balance of gases in nature. During photosynthesis, plants use sunlight, water, and carbon dioxide to make food and release oxygen. In respiration, plants and animals use oxygen to break down food for energy, releasing carbon dioxide. This exchange of gases keeps oxygen and carbon dioxide levels balanced, supporting life on Earth.

135. Table : Presence of starch in green and non-green parts of the leaves of plants

S.No.	Light conditions for potted plant	Initial colours before iodine test	Final colours after iodine test
1.	Plant kept in sunlight 	Green and non-green patches on the leaf 	Green patches of leaf turned blue-black 
2.	Plant kept in the dark 	Green and non-green patches on the leaf 	No change in colour 

Ans. : Observation and Conclusion :

Only the green parts of the leaf can perform photosynthesis and make starch due to the presence of chlorophyll.

Sunlight is necessary for photosynthesis to occur and for starch to be produced in leaves.

136. Fig. Experiment to check for water transportation in plants

(a) With water

(b) With coloured water, plant twigs placed in water with different treatments

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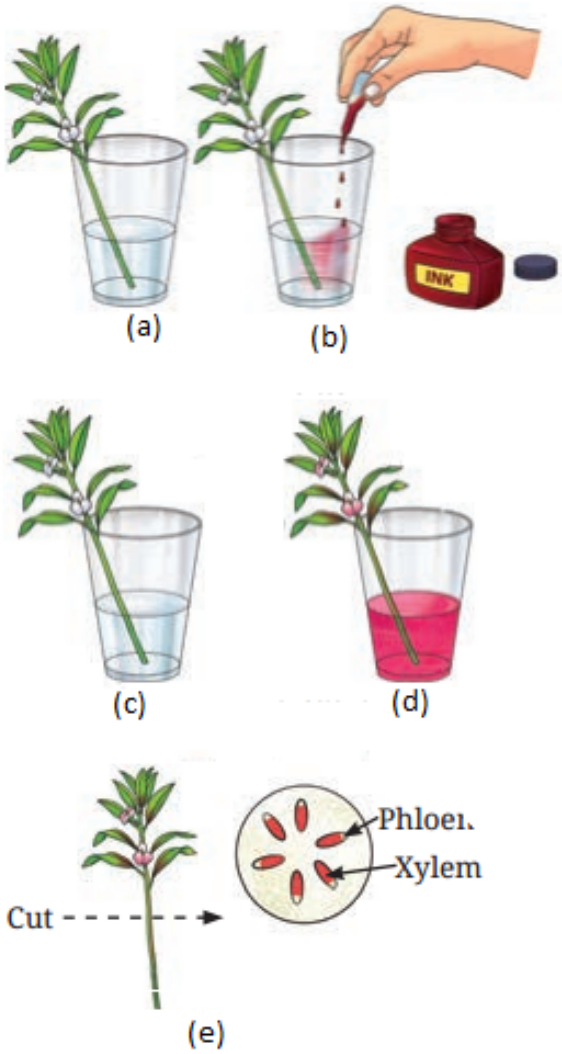
(c) With water
(d) With coloured water, plant twigs after one day
(e) Enlarged view of cut end of the twig



Ans. : Observation and Conclusion :
This experiment shows that water and minerals are transported through the xylem in plants. Xylem is thin, tube-like structure found in the stem, branches, and leaves, carrying water and minerals from the roots to all parts of the plant.

137. Fig. Set-up to test respiration in plants
(i) Does the lime water turn milky in both the test tubes?

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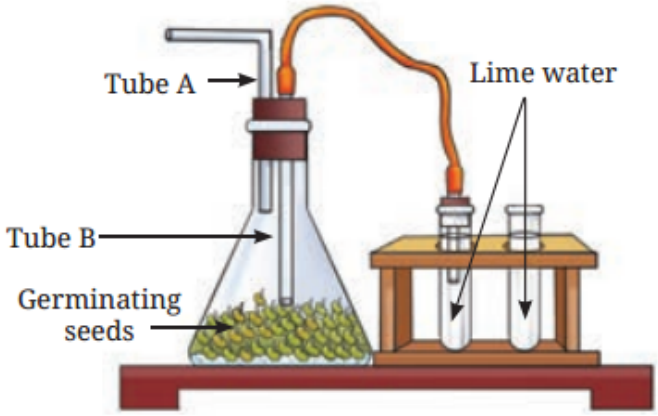
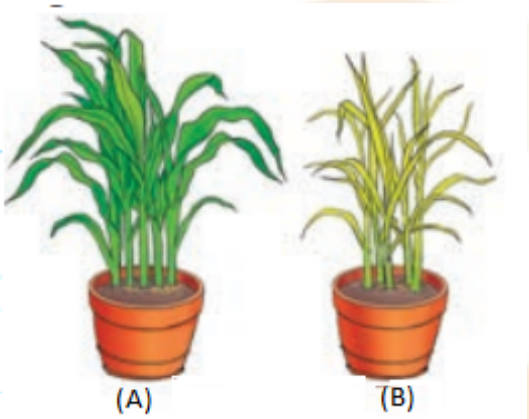
(ii) Why does the lime water turn milky in the test tube connected to the flask?



Ans. : (i) The lime water turn milky only in the test tube connected to the flask.
(ii) Lime water turns milky due to the presence of carbon dioxide. This carbon dioxide is produced by the seeds during respiration.
Observation and Conclusion: Plants also respire like us and release carbon dioxide.

138. Krishna set-up an experiment with two potted plants of same size and placed one of them in sunlight and the other in a dark room, as shown in Fig.



(i) What idea might she be testing through this experiment?
(ii) What are the visible differences in plants in both the conditions?
(iii) According to you, leaves of which plants confirm the iodine test for the presence of starch?

Ans. : (i) Through this experiment, she is testing whether sunlight is necessary for photosynthesis in plants or not.
(ii) The plant kept in sunlight looks healthy and green as it performs photosynthesis while the plant kept in the dark room looks weak, pale, and yellowish because it cannot perform photosynthesis properly.
(iii) The leaves of the plant kept in sunlight will confirm the iodine test for starch.

139. Vani believes that 'carbon dioxide is essential for photosynthesis'. She puts an experimental set-up, as shown in Fig, to collect evidence to support or reject her idea.

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(a) (b) (c) (d)

Fig. A potted plant with sufficient water is placed under the prescribed conditions.

(a) Sunlight with carbon dioxide

(b) Sunlight without carbon dioxide

(c) Dark with

(d) Dark without carbon dioxide carbon dioxide

Answer the following questions.

(i) In which plant(s) in the above set-up(s) will starch be formed?

(ii) In which plant(s) in the above set-up(s) will starch not be formed?

(iii) In which plant(s) in the above set-up(s) will oxygen be generated?

(iv) In which plant(s) in the above set-up(s) will oxygen not be generated?

Ans. : (i) Only in plant kept in sunlight with carbon dioxide, starch will be formed.

(ii) In all plants except the plant kept in sunlight with carbon dioxide.

(iii) Oxygen will be generated in a plant kept in sunlight with carbon dioxide.

(iv) Except for the plant kept in sunlight with carbon dioxide, oxygen will not be generated in any of the other plants.

140. A goat eats away all the leaves of a small plant (balsam). However, in a few days, new leaves could be seen sprouting in the plant again. How did the plant survive without leaves?

Ans. : During the process of photosynthesis, the plant takes water, carbon dioxide, and essential nutrients from the surroundings, converts them to energy or carbohydrates, and stores them. The plant managed to survive in the absence of leaves due to the energy stored in the plant in the form of starch.

141. Sunlight, chlorophyll, carbon dioxide, water, and minerals are raw materials essential for photosynthesis. Do you know where they are available? Fill in the blanks with the appropriate raw materials.

(a) Available in the plant : _____

(b) Available in the soil : _____

(c) Available in the air : _____

(d) Available during day : _____

Ans. : (a) Chlorophyll

(b) Water, minerals

(c) Carbon dioxide

(d) Sunlight

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142. How do plants obtain the raw materials for photosynthesis from the surroundings?

Ans. : Plants obtain the raw materials for photosynthesis from their surroundings in different ways. They absorb water through their roots from the soil, take in carbon dioxide from the air through stomata, and capture sunlight using the chlorophyll in their leaves.

143. Give a brief description of the process of synthesis of food in green plants.

Ans. : Green plants make their food using sunlight, carbon dioxide, and water. The chlorophyll in the leaves absorbs sunlight, while the plant takes in carbon dioxide from the air through small openings called stomata and water from the soil through the roots. Using sunlight's energy, the plant combines carbon dioxide and water to produce glucose (food) and release oxygen as a by-product.

144. How do plants transport raw materials to the food factories of the plants?

Ans. : Plants transport raw materials to the leaves through different methods. Water is absorbed by the roots and carried to the leaves viaxylem vessels, while carbon dioxide enters the leaves through stomata. Nutrients from the soil are also transported with water. These materials are used by the leaves to make food through photosynthesis. The food prepared in the leaves are transported to other parts of the plant through another set of thin tube-like structure called the phloem.

145. Fill in the blanks of the paragraph given below with the words provided in the box.
chlorophyll, energy, food, carbon, dioxide, water, photosynthesis
Note: A word can be used more than once.
Leaves have a green pigment called _____ which captures _____ from sunlight. This energy is used in the process of _____ and, along with other raw materials like _____ and _____ synthesises _____.

Ans. : Leaves have a green pigment called chlorophyll, which captures energy from sunlight. This energy is used in the process of photosynthesis and, along with other raw materials like carbon dioxide and water, synthesises food.

146. What is the role of stomata in both photosynthesis and respiration?

Ans. : Stomata are tiny pores present on the lower surface of leaves. During photosynthesis, stomata allow carbon dioxide to enter the leaves. During respiration, they help in the exchange of gases oxygen comes in, and carbon dioxide goes out. Stomata are very important because they help the plant breathe and make food. Without them, the plant would not be able to take in the gases needed for life processes.

147. Define xylem and phloem.

Ans. : self

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148. How is food produced by leaves transported to other parts of the plant?

Ans. : Food produced in the leaves in the form of glucose is transported to other parts of the plant through phloem in the form of sucrose to provide energy for growth and storage.

149. How do leaves exchange gases during the process of photosynthesis?

Ans. : Leaves exchange gases through stomata, small openings on the surface of the leaf. Carbon dioxide enters the leaf through stomata, and oxygen produced during photosynthesis exits through them.

150. Why is chlorophyll important for the production of starch in plants?

Ans. : Chlorophyll absorbs sunlight, which provides the energy needed for photosynthesis. Without chlorophyll, plants cannot produce glucose, which is later stored as starch.

151. What is respiration in plants? How is it different from photosynthesis? Explain the importance of both processes.

Ans. : Respiration in plants is the process of breaking down glucose to release energy.

Difference: Photosynthesis produces glucose using sunlight, while respiration releases energy from glucose.

Importance: Photosynthesis provides food and oxygen, while respiration provides energy for growth, reproduction, and other life processes.

152. Design an experiment to observe if water transportation in plants is quicker in warm or cold conditions.

Ans. : To test whether water transportation in plants is quicker in warm or cold conditions, take two identical potted plants. Place one plant in a warm location (near a heater or sunny spot) and the other plant in a cool place (like in the shade). Add a few drops of food colouring to the water and water both plants. After a few hours, observe the movement of the coloured water up the stem and into the leaves. The plant in the warm conditions will show faster movement of the coloured water, as higher temperatures increase the rate of evaporation and water transportation.

*** consists of questions of 3 marks each.** **[39]**

153. Read the passage and answer the questions :

Bhaskar conducted an experiment on green and non-green patches of leaves to test starch. He observed that only green-patches turned blue-black.

Q.1. Which test did he perform?

(a) Alcohol test (b) Iodine test

(c) Red ink test (d) Water test

Q.2. Why did only green patches turn blue-black?

(a) They absorbed oxygen

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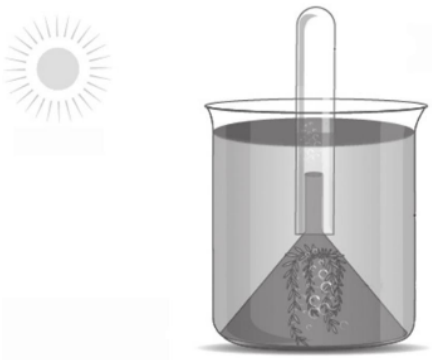
(b) They had stomata
(c) They had chlorophyll
(d) They were thicker
Q.3. What conclusion did he derive?
(a) Sunlight is essential for photosynthesis
(b) Starch is formed in green areas with chlorophyll
(c) Water is sufficient for photosynthesis
(d) Photosynthesis happens at night

Ans. : (b) Iodine test
(c) They had chlorophyll
(b) Starch is formed in green areas with chlorophyll

154. Observe the given picture and answer the questions that follow:



1. Why is the plant placed in water for this experiment, and what would happen if the plant were not submerged?
2. Which gas is collected in the test tube, and what does its presence indicate about the process occurring in the plant?
3. Explain the role of sunlight in the setup and predict the result if the entire setup was placed in complete darkness

Ans. : self

155. Design an experiment to observe if water transportation in plants is quicker in warm or cold conditions.

Ans. : To test whether water transportation in plants is quicker in warm or cold conditions, take two identical potted plants. Place one plant in a warm location (near a heater or sunny spot) and the other plant in a cool place (like in the shade). Add a few drops of food colouring to the water and water both plants. After a few hours, observe the movement of the coloured water up the stem and into the leaves. The plant in the warm conditions will show faster movement of the coloured water, as higher temperatures increase the rate of evaporation and water transportation.

156.

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Part of the leaf	Availability of				Starch present (Yes/No)
	Water	Sunlight	Chlorophyll	Carbon dioxide	
Part of the leaf inside the bottle	Yes	Yes	Yes	No	No
Part of the leaf outside the bottle	Yes	Yes	Yes	Yes	Yes

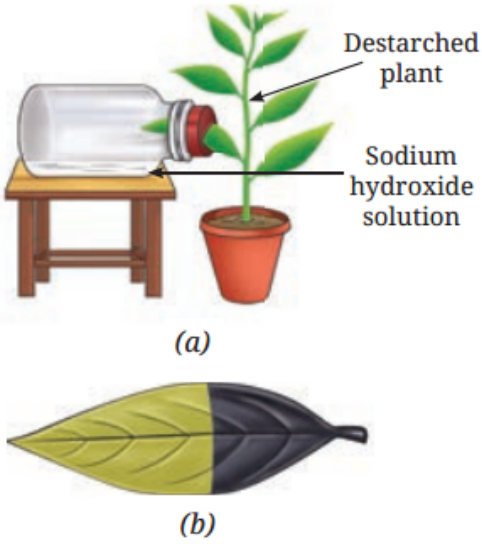

Fig. Testing the role of chlorophyll and air, (a) The set-up (b) Iodine test on the leaf

Ans. : Observation and Conclusion :

The part of the leaf that was inside the bottle with caustic soda (sodium hydroxide) did not turn blue-black after the iodine test. This shows that no starch was produced in that part because caustic soda absorbs carbon dioxide, which is needed for photosynthesis.

The part of the leaf that was outside the bottle turned blue-black, showing that starch was produced because that part had access to carbon dioxide and could perform photosynthesis. This experiment proves that carbon dioxide is necessary for plants to prepare starch.

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157.

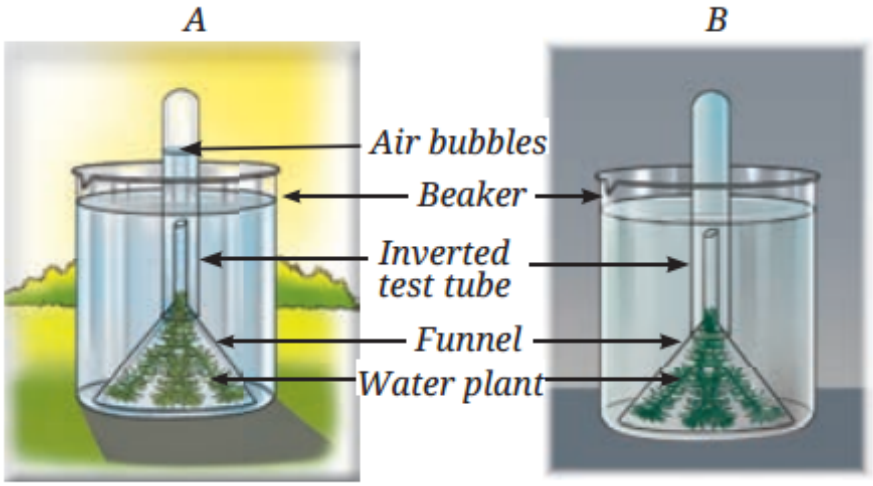

Fig. Activity showing the release of oxygen during photosynthesis

(i) What difference do you observe in the two set¬ups?

(ii) Do you observe air bubbles emerging in the inverted test tube in set-up A?

(iii) The gas produced in this set-up caused bubbles to emerge and get accumulated in the inverted test tube. Which gas is this?

Ans. : (i) In set-up A (kept in sunlight), we observe bubbles on the inverted test tube. While in set¬up B (kept in the dark), no bubbles are seen.

(ii) Yes, air bubbles are seen rising and collecting in the inverted test tube in set-up A.

(iii) The gas produced is oxygen, which is released during photosynthesis.

Observation and Conclusion :

When a test tube is taken off the set-up and a lit matchstick is inserted into the tube, it produces an intense flame, which confirms that oxygen gas is released during the process of photosynthesis.

158. Complete the following table.

S.No.	Feature	Photosynthesis	Respiration
1.	Raw materials		
2.	Products		
3.	Word equation		
4.	Importance		

Ans. :

S. No.	Feature	Photosynthesis	Respiration
1.	Raw materials	Sunlight, water, chlorophyll and carbon dioxide,	Glucose (from food made during. photosynthesis), oxygen (from the air)
2.	Products	Glucose and oxygen (released in the air)	Carbon dioxide, water and energy (used for various activities in the plant)

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3.	Word equation	Carbon dioxide + Water $\xrightarrow[\text{Chlorophyll}]{\text{Sunlight}}$ Glucose + Oxygen	$\text{Glucose} + \text{Oxygen} \longrightarrow \text{Carbon dioxide} + \text{Water} + \text{Energy}$
4.	Impor-tance	It helps plants make their own food and produces oxygen, which is essential for life on Earth.	It provides energy to plants for growth, development, and other life processes.

159. Ananya took four test tubes and filled three- fourth of each test tube with water. She labelled them A, B, C, and D (Fig). In test tube A, she kept a snail; in test tube B, she kept a water plant; in test tube C, she kept both a snail and a plant. In test tube D, she kept only water. Ananya added a carbon dioxide indicator to all the test tubes. She recorded the initial colour of water and observed if there are any colour changes in the test tubes after 2-3 hours. What do you think she wants to find out? How will she know if she is correct?

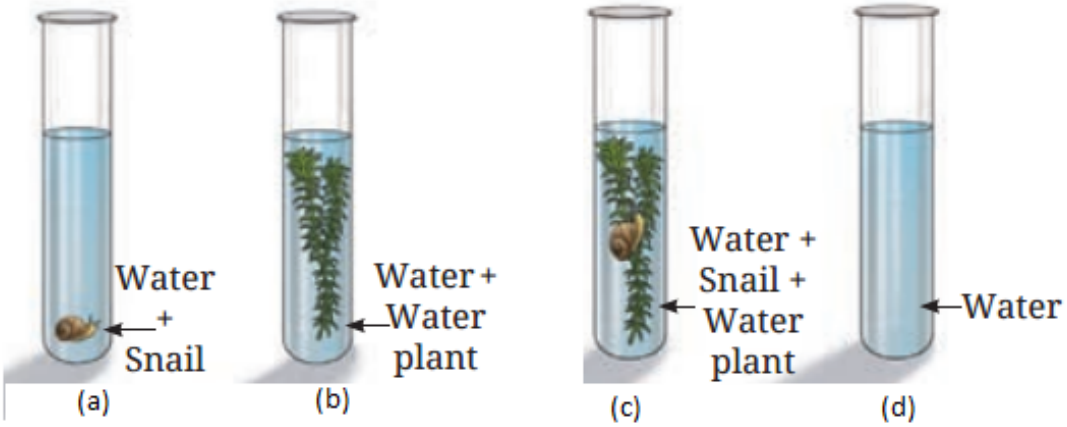

Fig. Experimental set-up

Ans. : Ananya wants to find out how plants and animals affect the amount of carbon dioxide in water. She is testing the role of respiration and photosynthesis. The carbon dioxide indicator changes colour depending on how much carbon dioxide is present in the water. Ananya will know she is correct by observing the colour changes in the carbon dioxide indicator in each test tube :

1. Test Tube A (Snail only): The indicator will turn yellow/orange, showing increased carbon dioxide due to the snail's respiration.
2. Test Tube B (Plant only): The indicator will turn blue/purple, showing decreased carbon dioxide because the plant uses it during photosynthesis.
3. Test Tube C (Snail + Plant): The colour may stay neutral or slightly blue, showing a balance as the snail gives out carbon dioxide and the plant uses it.
4. Test Tube D (Only water): No colour change, as there is no living organism to add or remove carbon dioxide.

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160.

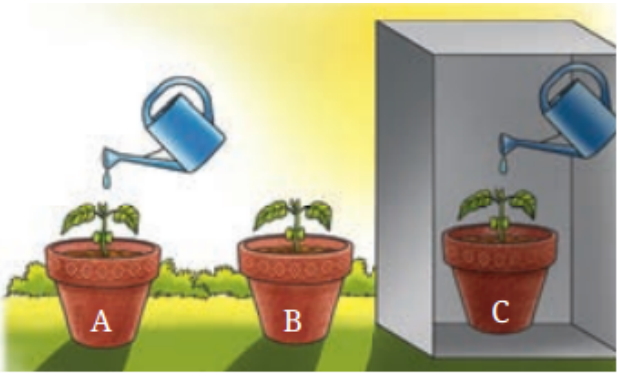

Fig. Experimental set-up to understand the role of sunlight and water in plant growth

(a) Pot A kept in direct sunlight, with water

(b) Pot B kept in direct sunlight, without water

(c) Pot C kept in dark with water

Table : Effects of sunlight and water on plant growth

Pots kept under different conditions	Availability of		Height of plant (cm)		Number of leaves		Colour of Leaves (Green/ Yellow)
	Sunlight	Water	Day 1	After 2 Weeks	Day 1	After 2 Weeks	
Pot A: In direct sunlight, with water	Yes	Yes	Same	Taller plant	Same	More green leaves	Green leaves
Pot B: In direct sunlight, without water	Yes	No	Same	Possibly	Same	Less than Pot A	Yellow leaves
Pot C: In the dark, with water	No	No	Same	wilted	Same	Least	Yellow leaves

Observation and Conclusion: The following points can be noted :

(i) What differences did you observe between the plants in the three pots?

(ii) Which pot has the plant with the maximum growth?

(iii) Which pot has the plant with the least growth?

Ans. : (i)The plants in the three pots showed noticeable differences after two weeks. Pot A, which received both sunlight and water, grew the tallest, had the most leaves, and stayed green, showing healthy development.

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Pot B, with sunlight but no water, showed very little growth, fewer leaves, and yellowing due to dehydration.

Pot C, kept in the dark but watered, exhibited limited growth, with slightly pale yellow leaves and fewer new leaves, indicating that light is essential for healthy, green plants.

(ii) Pot A

(iii) Pot C

161. How would you test the presence of starch in leaves?

Ans. : To test the presence of starch in leaves, following steps is followed:

1. Keep the leaf in boiling water for 5 minutes to soften it.
2. Dip this leaf in a test tube containing alcohol to remove the chlorophyll,
3. Place the test tube in a beaker with boiling water.
4. Wait for the leaf to become colourless,
5. Take out the leaf and place it on a plate,
6. Finally, add a few drops of iodine solution to the leaf. Wait for few minutes and observe.
7. If the leaf turns blue-black, it indicates the presence of starch.

162. Answer the following:

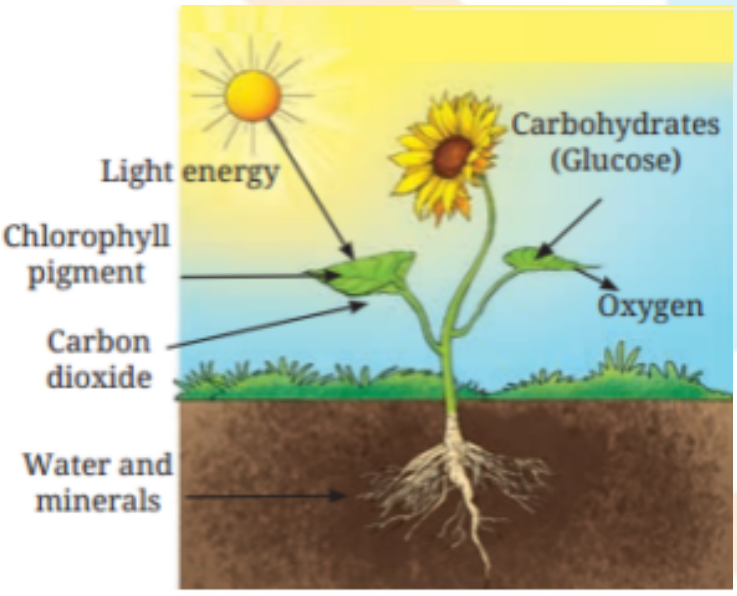
(i) Draw a schematic diagram showing photosynthesis.

(ii) What are the products of photosynthesis?

(iii) Name the gases utilised and liberated in photosynthesis.

(iv) Can all plants do photosynthesis?

Ans. : (i) A schematic diagram showing photosynthesis is as following:



(ii) The products of photosynthesis are glucose and oxygen.

(iii) The oxygen is liberated, and carbon dioxide is utilised in photosynthesis.

(iv) All plants cannot do photosynthesis, only green plants, which contain chlorophyll pigment, can do photosynthesis.

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163. Complete the equations and name the processes:

(i) **Glucose** + $\square \xrightarrow{\text{energy released}} \square$ + **Water**

(ii) $\square$ + **Water** $\xrightarrow[\text{Chlorophyll}]{\text{Sunlight}} \square$ + **Oxygen**

(iii) Differentiate between the two processes,

Ans. :

(i) Respiration :

Glucose + Oxygen $\xrightarrow{\text{energy released}}$ Carbon dioxide + Water

(ii) Photosynthesis :

Carbon dioxide + Water $\xrightarrow[\text{Chlorophyll}]{\text{Sunlight}}$ Glucose + Oxygen

(iii) Photosynthesis is the process by which green plants make food using sunlight, carbon dioxide, and water. It happens in the leaves during the day and gives out oxygen. Respiration is the process by which plants use oxygen to break down food and release energy. It happens in all parts of the plant, both day and night, and gives out carbon dioxide.

164. Oxygen which is essential for the survival of all organisms is produced during photosynthesis. In the absence of photosynthesis, life would be impossible on the earth. During photosynthesis, chlorophyll containing cells of leaves, in the presence of sunlight, use carbon dioxide and water to synthesise carbohydrates. During the process oxygen is released. The presence of starch in leaves indicates the occurrence of photosynthesis. Starch is also a carbohydrate.

Q.1. Which component is essential for the survival of all the living organisms?

(a) Oxygen (b) Carbon dioxide (c) Carbon Monoxide (d) Hydrogen

Q.2. Name the green pigment present in leaves.

Q.3. How we come to know the occurrence of photosynthesis in a plant?

Ans. : 1. (a) Oxygen

2. Chlorophyll

3. The presence of reserve food material (i.e. starch) in the leaves of plant indicates the occurrence of photosynthesis.

165. Explain the difference between xylem and phloem.

Ans. : self

*** consists of questions of 5 marks each.** **[40]**

166. Explain the complete process of photosynthesis with a diagram and equation.

Ans. : self

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167. What are the necessary conditions for photosynthesis and how were they tested?

Ans. : → Photosynthesis, the process by which plants convert light energy into chemical energy, requires specific conditions to occur efficiently. The essential conditions include sunlight, chlorophyll, carbon dioxide, and water.

→ For instance, the need for sunlight was demonstrated by comparing plants kept in sunlight versus those in the dark, with only the former producing starch.

Chlorophyll's role was confirmed using variegated leaves, where only the green parts (containing chlorophyll) could perform photosynthesis.

→ The requirement for carbon dioxide was shown by placing a leaf in a sealed container with and without a carbon dioxide absorbent, revealing that carbon dioxide is essential for starch production.

→ Lastly, the necessity of water is evident as plants without water fail to thrive and produce food.

168. How does the structure of a leaf support its function in photosynthesis?

Ans. : (1) Large Surface Area:

→ Leaves are generally broad and flat.

→ This maximizes the surface area exposed to sunlight, allowing the leaf to capture as much light as possible for photosynthesis.

(2) **Thinness:**

→ Leaves are relatively thin.

→ This allows sunlight to penetrate through the layers of the leaf, ensuring that the light reaches the chloroplasts in the cells where photosynthesis occurs. It also reduces the distance that carbon dioxide has to diffuse to reach the photosynthetic cells.

(3) **Stomata:**

→ Leaves have tiny pores, usually on the underside, called stomata.

Stomata allow for gas exchange. Carbon dioxide enters the leaf for photosynthesis, and oxygen (a byproduct of photosynthesis) exits the leaf.

(4) **Chloroplasts:**

→ The cells within the leaf, particularly the mesophyll cells, are packed with chloroplasts.

→ Chloroplasts contain chlorophyll, the pigment that absorbs sunlight.

(5)**Vascular Bundles (Xylem and Phloem):**

→ Leaves have a network of veins containing xylem and phloem.

→ Xylem brings water to the leaf for photosynthesis, and phloem carries the sugars produced during photosynthesis to other parts of the plant.

169. Describe the transport system in plants in detail.

Ans. : → Think of xylem as the plant's plumbing system for water and minerals.

→ Xylem tissue transports water and dissolved minerals from the roots to the stems and leaves.

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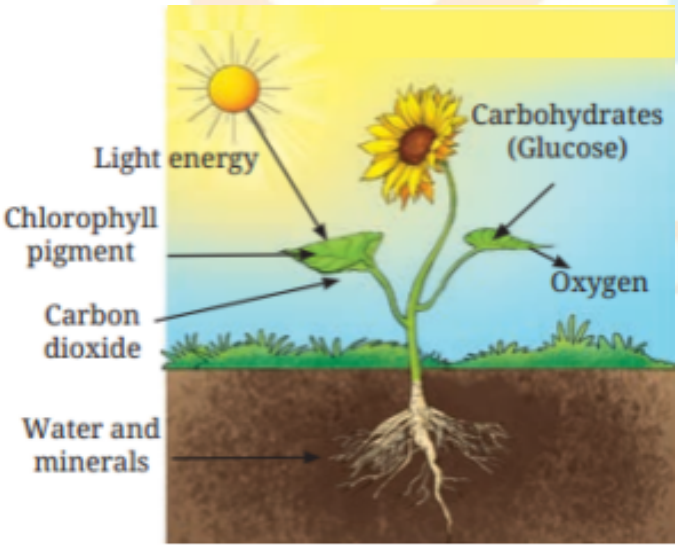
→ The flow in the xylem is primarily unidirectional (upwards from the roots).
→ Now, phloem is like the plant's food delivery service.
→ Phloem tissue transports sugars (produced during photosynthesis) from the leaves to other parts of the plant.
→ The flow in the phloem can be bidirectional, meaning it can move sugars both upwards and downwards to reach all parts of the plant.

170. How do we know that respiration occurs in plants?

Ans. : → Plants, like all living organisms, require energy to perform various functions necessary for growth and survival.
→ Although plants produce their own food through photosynthesis, they cannot directly use the energy stored in glucose.
→ To access this energy, plants undergo respiration, a process that breaks down glucose in the presence of oxygen to release energy, carbon dioxide, and water.
→ Experimental evidence, such as observing carbon dioxide production in the absence of photosynthesis (e.g., in the dark), confirms that plants respire.
→ This process occurs in all plant parts, both day and night, ensuring a continuous supply of energy for cellular activities.

171. What is photosynthesis? Explain the process of photosynthesis in the plants.

Ans. : The green plants can prepare their own food. The process by which green plants make their own food is called photosynthesis (Photo = light, synthesis = to make). Every green part of the plant can prepare food but leaves are the most prominent.
The green leaves are called 'food factories' of the plant. If stem is green, it can also carry out photosynthesis. Green parts of a plant have green pigment in them known as chlorophyll. Chlorophyll pigment traps light energy from the sun and uses it in making food. Plants receive light energy from the sun, carbon dioxide from the atmosphere and water from the soil. As a result of photosynthesis, plants synthesise glucose and give out oxygen. Thus, the green plants convert these raw materials into food with the help of light energy.



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172. Describe the process of photosynthesis. What is the role of chlorophyll, water, carbon dioxide, and sunlight in this process?

Ans. : Photosynthesis is the process by which green plants make their own food using carbon dioxide, water, and sunlight. It occurs mainly in the leaves, specifically in the chloroplasts which contain chlorophyll.
Chlorophyll absorbs sunlight and provides the energy required for photosynthesis.
Water is absorbed by the roots and transported to the leaves through xylem; it is a raw material for making glucose.
Carbon dioxide enters the leaves through stomata and is used to form glucose.
Sunlight provides the energy needed to convert carbon dioxide and water into glucose and oxygen.
The overall reaction can be written as:
Carbon dioxide + Water → (Sunlight & Chlorophyll) → Glucose + Oxygen
This process provides food for the plant and oxygen for the environment. Without any of these components, photosynthesis cannot occur efficiently.

173. With the help of an experiment, explain that carbon dioxide is released during respiration.

Ans. : 1.Take a small test tube containing lime water.
2.Place a small amount of germinating seeds in a conical flask and cover it with a cotton plug.
3.Connect the flask to the test tube with tubing so that air exhaled or released from seeds passes into the lime water.
4.Keep the setup for some time.
Observation: The lime water turns milky, indicating the presence of carbon dioxide.
Conclusion: This shows that germinating seeds respire and release carbon dioxide, which reacts with lime water to produce calcium carbonate, making the water milky. This experiment demonstrates that carbon dioxide is a byproduct of respiration in living organisms.

*** Match the Following.** **[8]**

Column A	Column B
174. Xylem	(a) Transports food
175. Phloem	(b) Gas exchange
176. Stomata	(c) Energy release
177. Chlorophyll	(d) Transports water
	(e) Green pigment

Ans. : (1-d,2-a,3-b,4-e)

Function	Component
178. Green pigment in leaves	(a) Small openings in leaves

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179. Process by which plants make food	(b) Gas used in photosynthesis
180. Simple carbohydrate made by plants	(c) Simple carbohydrate made by plants
181. Gives energy by breaking down food	(d) Process by which plants make food

Ans. :

Function	Component
1. Green pigment in leaves	(c) Simple carbohydrate made by plants
2. Process by which plants make food	(a) Small openings in leaves
3. Simple carbohydrate made by plants	(d) Process by which plants make food
4. Gives energy by breaking down food	(b) Gas used in photosynthesis

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