1.NUTRITION IN PLANTS

TEACHING TASK

1.Raw materials for photosynthesis:
Answer: (D) All of them (Carbon dioxide, Water, Sunlight)
Explanation: Photosynthesis requires carbon dioxide (CO_2) from the air, water (H_2O) from the soil, and sunlight as an energy source to produce glucose and oxygen. All three are essential raw materials.

2.An example of an autotrophic plant is:
Answer: (D) Neem
Explanation: Autotrophic plants produce their own food through photosynthesis. Neem is a green plant capable of photosynthesis, unlike mushrooms (fungi, saprophytic), mould (fungi, saprophytic), or dodder (parasitic plant).

3.An example of a saprophytic plant is:
Answer: (B) Monotropa
Explanation: Saprophytic plants, like Monotropa (Indian pipe), obtain nutrients from dead organic matter. Dodder is parasitic, and mushrooms are fungi, not plants, though they are saprophytic.

4.The life processes that provide energy are:
Answer: (C) Both nutrition and respiration
Explanation: Nutrition (e.g., photosynthesis in plants) provides energy-rich compounds like glucose, and respiration breaks down these compounds to release energy as ATP. Response to stimuli does not directly provide energy.

5.Which of these is not necessary for photosynthesis?
Answer: (D) Oxygen in air
Explanation: Photosynthesis requires carbon dioxide, chlorophyll, and light. Oxygen is a byproduct of photosynthesis, not a requirement.

6.Identify the carnivorous plant:
Answer: (C) Both of them (Pitcher plant, Venus fly trap)
Explanation: Both pitcher plants and Venus flytraps are carnivorous plants that trap and digest insects to supplement their nutrient intake.

7.CO_2 and O_2 balance in the atmosphere is due to:
Answer: (B) Photosynthesis
Explanation: Photosynthesis consumes CO_2 and releases O_2, while respiration consumes O_2 and releases CO_2 , maintaining atmospheric balance. Photosynthesis is the primary process for oxygen production.

8.During photosynthesis, the oxygen in glucose comes from:
Answer: (B) Carbon dioxide

Explanation: In photosynthesis, the oxygen atoms in glucose ($C_6H_{12}O_6$) originate from CO_2, while the oxygen released as O_2 comes from water (H_2O).

9.The source of O_2 liberated in photosynthesis is:
Answer: (C) Water
Explanation: During the light-dependent reactions, water molecules are split (photolysis) to release electrons, protons, and O_2. The oxygen liberated comes from water, not CO_2 or other sources.

10.Grana refers to:
Answer: (C) Stacks of thylakoids
Explanation: Grana are stacks of thylakoids (membrane-bound structures) in chloroplasts where the light-dependent reactions of photosynthesis occur.

11.Which wavelength of light is absorbed maximum for photosynthesis?
Answer: (A) Red light
Explanation: Chlorophyll absorbs red light (around 660–680 nm) and blue light most efficiently. Red light is slightly more effective in driving photosynthesis.

12.Which of the following is the least effective in photosynthesis?
Answer: (C) Green light
Explanation: Chlorophyll reflects green light, making it the least effective for photosynthesis compared to red and blue light.

13.The assimilatory power in photosynthesis is:
Answer: (C) ATP and $NADPH_2$
Explanation: Assimilatory power refers to ATP and NADPH produced during the light-dependent reactions, used in the Calvin cycle to fix CO_2 into glucose.

14.A specific function of light energy in the process of photosynthesis is to:
Answer: (A) Activate chlorophyll
Explanation: Light energy excites chlorophyll molecules, initiating the light-dependent reactions by energizing electrons, which leads to water splitting and ATP/NADPH production.

15.ATP formation during photosynthesis is known as:
Answer: (B) Photophosphorylation
Explanation: ATP synthesis in photosynthesis occurs via photophosphorylation, driven by light energy in the thylakoid membranes during the light-dependent reactions.

16.Dark reaction in photosynthesis is called so because:
Answer: (A) It does not require light energy
Explanation: The dark reaction (Calvin cycle) does not directly require light, as it uses ATP and NADPH from the light-dependent reactions to fix CO_2 in the stroma.

17.Dark reaction of photosynthesis occurs in the:

Answer: (A) Stroma of the chloroplast outside the lamellae
Explanation: The dark reaction (Calvin cycle) takes place in the stroma, the fluid-filled space surrounding the thylakoids in chloroplasts.

18.Holophytic nutrition means:
Answer: (A) Autotrophism
Explanation: Holophytic nutrition is synonymous with autotrophic nutrition, where organisms (e.g., plants) produce their own food via photosynthesis.

19.Autotrophic nutrition occurs in:
Answer: (D) Both B and C (Plants, Some protists and prokaryotes)
Explanation: Plants, some protists (e.g., algae), and certain prokaryotes (e.g., cyanobacteria) perform autotrophic nutrition via photosynthesis. Fungi are heterotrophic.

20.Mushroom, Rhizopus, and Yeast are:
Answer: (D) Saprophytic
Explanation: These are fungi that obtain nutrients by decomposing organic matter, characteristic of saprophytic nutrition.

21.Chlorophyll is present:
Answer: (A) In the grana of chloroplast
Explanation: Chlorophyll is located in the thylakoid membranes of the grana, where it captures light for photosynthesis.

22.Chlorophyll cannot absorb one of the following:
Answer: (D) Green light
Explanation: Chlorophyll absorbs red and blue light efficiently but reflects green light, which is why plants appear green.

23.The oxygen in photosynthesis is released from:
Answer: (B) H_2O
Explanation: Oxygen released during photosynthesis comes from the photolysis of water in the light-dependent reactions.

24.Dark reaction of photosynthesis occurs in:
Answer: (B) Stroma
Explanation: The dark reaction (Calvin cycle) occurs in the stroma of the chloroplast, where CO_2 is fixed into glucose.

25.Photosynthesis proceeds in sequence of:
Answer: (C) Light phase and dark phase
Explanation: Photosynthesis occurs in two stages: the light-dependent reactions (light phase) in the thylakoids, followed by the light-independent reactions (dark phase) in the stroma.

26.In bacterial photosynthesis, the hydrogen donor is:

Answer: (D) H_2S
Explanation: In bacterial photosynthesis (e.g., in purple sulfur bacteria), H_2S often serves as the hydrogen donor instead of H_2O, producing sulfur instead of oxygen.

27.Chlorophyll in chloroplasts is located in:
Answer: (A) Grana
Explanation: Chlorophyll is embedded in the thylakoid membranes of the grana, where light-dependent reactions occur.

28.Which of the following is the best equation representing photosynthesis?
Answer: (C) energy + 6 CO_2 + 12 H_2 O $\rightarrow$ C_6 $H_{12}O_6$ + 6H_2 O + 6 O_2
Explanation: The balanced equation for photosynthesis is 6 CO_2 + 12 H_2O + light energy $\rightarrow$ C_6 $H_{12}O_6$ + 6O_2 + 6 H_2O accounting for all reactants and products accurately.

29.In which part of chloroplast does the light reaction of photosynthesis occur?
Answer: (A) Grana
Explanation: The light-dependent reactions occur in the thylakoid membranes of the grana, where chlorophyll absorbs light.

30.The raw materials for photosynthesis are:
Answer: (D) CO_2 and water
Explanation: The primary raw materials for photosynthesis are carbon dioxide (CO_2) and water (H_2 O), with sunlight providing the energy and chlorophyll acting as the catalyst.

LEARNERS TASK

Single Correct Answer Type

1. Holophytic nutrition means
Answer: (A) autotrophism
Explanation: Holophytic nutrition is a type of autotrophic nutrition where organisms like green plants synthesize their own food using light, water, and CO, .

2. The process represented by the equation is
Answer: (A) Photosynthesis
Explanation: The equation shows the formation of glucose and oxygen using water and carbon dioxide, which defines photosynthesis.

3. The gas produced in the above process is
Answer: (A) Oxygen
Explanation: During photosynthesis, oxygen is released as a by-product.

4. The essential factors for the above process are
Answer: (B) Sunlight and Chlorophyll

Explanation: Sunlight provides energy, and chlorophyll captures that energy for photosynthesis.

5. This process is stopped at night because
Answer: (D) Sunlight is not available
Explanation: Light is necessary for the light-dependent reactions of photosynthesis.

6. In which substance the chemical energy is stored by the above process?
Answer: $C_6H_{12}O_6$ (Glucose)
Explanation: Glucose is the carbohydrate produced and stores the energy.

7. Autotrophic nutrition occurs in
Answer: (D) Both B and C
Explanation: Green plants, some protists (e.g., Euglena), and some prokaryotes (e.g., Cyanobacteria) are autotrophs.

8. Mushroom, Rhizopus and Yeast are
Answer: (D) Saprophytic
Explanation: These fungi feed on dead organic matter.

9. Which of the following statements about the autotrophs is incorrect?
Answer: (C) They convert carbon dioxide and water into carbohydrates in the absence of sunlight
Explanation: Sunlight is essential for photosynthesis in autotrophs.

10. Select the correct statement
Answer: (A) Heterotrophs do not synthesise their own food
Explanation: Heterotrophs depend on other organisms for food.

11. Chlorophyll is present
Answer: (A) in the grana of chloroplast
Explanation: Grana contains thylakoids where chlorophyll is embedded.

12. Chlorophyll cannot absorb one of the following
Answer: (D) green light
Explanation: Chlorophyll reflects green light, which is why plants appear green.

13. The process in which water is split during photosynthesis is
Answer: (A) Photolysis
Explanation: Photolysis means light-induced splitting of water molecules.

14.The oxygen in photosynthesis is released from
Answer: (B) H_2O
Explanation: Oxygen comes from the splitting of water, not CO_2.

15. Dark reaction of photosynthesis occurs in
Answer: (B) Stroma

Explanation: The stroma of the chloroplast is the site for the Calvin cycle (dark reactions).

16. Photosynthesis proceeds in sequence of
Answer: (C) Light phase and dark phase
Explanation: Light-dependent reactions occur first, followed by light-independent (dark) reactions.

17. In bacterial photosynthesis, the hydrogen donor is
Answer: (D) H_2S
Explanation: Some photosynthetic bacteria use hydrogen sulfide instead of water.

18. Light waves where photosynthesis is maximum are
Answer: (D) Violet-Blue and Red
Explanation: These wavelengths are most effectively absorbed by chlorophyll.

19. The carbohydrate reserve of plants is
Answer: (A) Starch
Explanation: Plants store excess glucose as starch.

20. Choose the event that does not occur in photosynthesis
Answer: (C) Oxidation of carbon to carbon dioxide
Explanation: CO_2 is reduced, not oxidized, during photosynthesis.

21. Chlorophyll in chloroplasts is located in
Answer: (A) grana
Explanation: Chlorophyll is embedded in thylakoid membranes, which make up grana.

22. Which of the following is the best equation representing photosynthesis?
Answer: (C) energy + 6 CO_2 + 12 H_2O $\xrightarrow{\text{Chlorophyll/Light}}$ $C_6H_{12}O_6$ + 6H_2O + 6O_2
Explanation: This equation correctly balances the photosynthesis reaction including water as both reactant and product.

23. In which part of chloroplast light reaction of photosynthesis occurs?
Answer: (A) Grana
Explanation: Light reactions occur in the thylakoid membranes which form the grana.

24.The raw materials for photosynthesis are
Answer: (D) CO_2 and water
Explanation: These are the basic inputs for glucose formation.

25.Plants are green in colour because
Answer: (B) they reflect green light
Explanation: Green light is not absorbed but reflected by chlorophyll.