9) State the role of light in photosynthesis.

Ans- Light plays a vital role in the process of photosynthesis. They are:

(a) It initiates light phase by activating the chlorophyll molecules and influence photolysis of water indirectly.

$$Ch \xrightarrow{Photon} Ch^+$$

$$Ch^+ + H_2O \longrightarrow H^+ + OH^-$$

(b) It causes photophosphorylation, i.e synthesis of ATP by addition of inorganic phosphate to ADP in presence of light.

$$ADP + Pi \xrightarrow[Chlorophyll]{Light} ATP$$

of photosynthesis.

10) What is the source of oxygen in photosynthesis? Show with the help of chemical reaction.

Ans- Water (H_2O) is the source of oxygen in photosynthesis. After photolysis of water when OH^- liberates an electron and forms OH radical, leads to the formation of oxygen and water.

$$4[OH^-] \xrightarrow{4e^-} 4[OH] \rightarrow 2H_2O_2 \rightarrow 2H_2O + O_2\uparrow$$

11) Define the following terms :

(a) Photophosphorylation – Synthesis of ATP in presence of light during photosynthesis by the addition of inorganic phosphate to ADP is called photophosphorylation.

(b) Absorption spectrum – The plot of efficiency with which the different pigments like chlorophyll-a and b absorb different wavelengths of light is called absorption spectrum.

(c) Photolysis of water – The phenomenon of splitting of water into hydrogen and hydroxyl ion by means of light activated chlorophyll is called photolysis of water.

(d) Action spectrum — The graph representing of the rate of biological effectiveness plotted against wavelength of light is called action spectrum.

12) Write the chemical formula of chlorophyll-a and chlorophyll-b.

Ans- The chemical formula of chlorophyll-a is $C_{55}H_{72}O_5N_4Mg$ and of chlorophyll-b is $C_{55}H_{70}O_6N_4Mg$.

13) What are the end products of light reaction?

Ans- The end products of light reaction are NADPH+H, O_2 and ATP, H_2O also formed.

14) How is the balance of carbon-dioxide and oxygen maintained in atmosphere?

Ans- Oxygen used during respiration and combustion causing oxygen deficit in the atmosphere is balanced by the O_2 liberated during photosynthesis by green plants. CO_2 is liberated during respiration, and combustion is balanced by taking it during photosynthesis. This is how CO_2-O_2 balance is maintained in atmosphere.

15) Describe the structure of chloroplast.

Ans- The chloroplasts are double-membrane bound structures containing granular bodies known as grana and a ground substance of fluid nature called stroma. Each granum is made up of stack of minute bag-like structures, each of which is called

a thylakoid. Green photosynthetic pigment is stored in high concentration called chlorophyll. They also contain other photosynthetic pigments such as orange carotene, yellow xanthophyll etc.

16) Why photosynthesis is also called carbon-assimilation?

Ans- Carbon fixation or carbon assimilation is the conversion process of inorganic carbon to organic compounds by living organisms. As plants convert inorganic CO_2 into organic glucose by means of photosynthesis. Therefore, photosynthesis is also called carbon-assimilation.