PHOTOSYNTHESIS

1) Mention the different steps of chemical reaction taking pl... during light phase of photosynthesis.

Ans The different steps of chemical reaction taking place during light phase of photosynthesis are:

(i) Activation of chlorophyll
(ii) Photolysis
(iii) Evolution of O_2
(iv) Formation of NADPH (Reduced NADP)
(v) Photophosphorylation.

2) Name the factors that affect the rate of photosynthesis.

Ans The factors that affect the rate of photosynthesis are classified into two groups.

i) External factors - light intensity, duration and quality, Temperature, carbondioxide.

ii) Internal factors - Chlorophyll, structure of leaf, protoplasm.

3) Explain the mechanism of absorption of light by photosynthesis

Ans Light wave starts with the absorption of light energy by the chlorophyll molecules the pigment get promoted to higher energy level the chlorophyll molecules are activated by the highly energised invisible solar particles called photon and gets excited.

4) Explain - Dark phase is more appropriate to called light independent phase.

Ans During Dark phase, the ATP and NADPH produced during light reaction is required but light reaction takes place in the

day time only and in night it stop so the production of ATP and NADPH also stops. Thus dark phase also stops during night. Hence, dark phase does not uses light but it cannot take place in the night. Thats why it is more appropriate to called it light independent phase.

5) Explain how the leaves are adapted to facilitate photosynthesis.

Ans The ~~adaption~~ adaptation of leaves for photosynthesis are

(a) leaves are generally flat and they are present in a large surface are to the light.

(b) The midrib and veins of leaves are surrounded by tissues which impart strength to the leaf and maintain the original shape

(c) A thick cuticle is present on the upper surface and a thin cuticle on the lower surface to prevent excessive water loss from the large surface to prevent excessive water loss from the large surface area of the leaves.

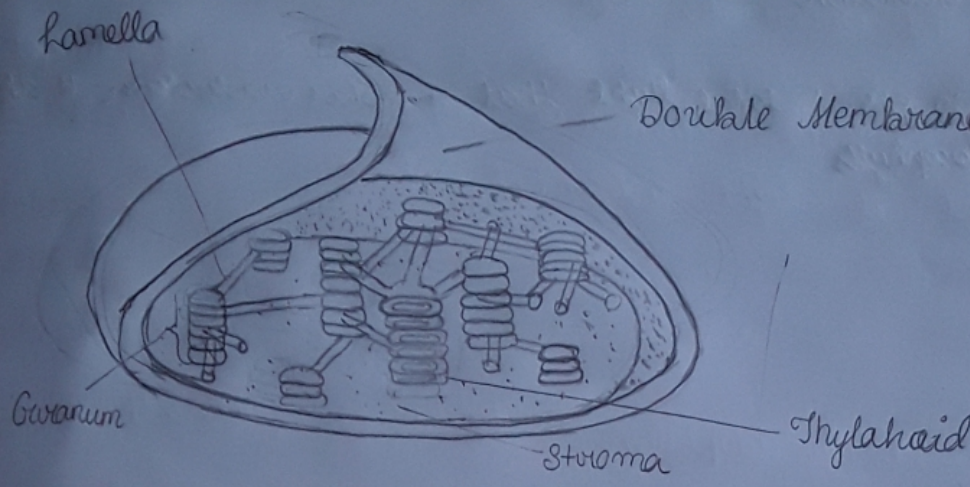
(d) Stomatal openings are present through which exchange of gases takes place with the atmosphere.

(e) A network of veins supply water to the photosynthetic cells and helps in quick disposal of photosynthetic product.

(f) Intercellular air spaces allow easy diffusion of gases throughout the whole day.

(g) Presence of maximum number of organelle of photosynthesis that is chloroplastid in the mesophyll tissue of leaf.

6) Draw the structure of chloroplast.



7) Differentiate between light phase and Dark Phase.

Ans The differences are as follows:-

Light phase	Dark phase
i) Light phase occurs in the grana of chloroplast.	i) Dark phase occurs in the stroma of chloroplast.
ii) Different steps of light reaction are dependent on photon particles of sunlight	ii) Different steps of dark phase are controlled by enzymes and it is not dependent on light.
iii) H_2O is needed for this phase	iii) CO_2 is absorbed in this phase.
iv) ATP and $NADPH_2$ are produced in this phase.	iv) ATP and $NADPH_2$ are utilized in this phase.
v) During light phase O_2 is evolved	v) During dark phase glucose is formed.

8) Which is the first stable compound of photosynthesis? How and when it is formed?

Ans PGA (Phosphoglyceric acid) is the first stable compound of photosynthesis.

PGA is formed during dark reaction when $6CO_2$ bind with 6 mol RuBP (a 5-C compound) to form 6 mol Diphosphoribital, (a 6-C compound which is very unstable) (Total no. of carbon = $6 \times 6 = 36$) and then 6 mol Diphosphoribital breaks into 12 mol PGA, a 3-C compound and total no of carbon is $12 \times 3 = 36$.