# Nutrition

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## Improve your learning

**Q. 1 A. Write differences between (AS1)**

**autotrophic nutrition – heterotrophic nutrition**

**Answer :**

| Differences | Autotrophic nutrition | Heterotrophic nutrition |
|---|---|---|
| Prepare their food | Yes<br>In autotrophic nutrition, the organisms prepare their own food. | No<br>In heterotrophic nutrition, the organisms don't their own food. |
| Presence in food chain | Producers<br>In the food chain, autotrophs are known as producers. | Consumers<br>In the food chain, heterotrophs are known as consumers. |
| Starting material | Carbon dioxide and water<br>The plants are autotrophs that use carbon dioxide from the atmosphere and water from the soil to produce carbohydrates in presence of sunlight, a process known as photosynthesis. | Complex organic matter<br>The heterotrophs (humans, deer) breakdown the complex organic matter with the help of enzymes to simpler molecules to derive energy and nutrition. |

**Q. 1 B. Write differences between (AS1)**

**Ingestion – digestion**

**Answer :**

| Difference | Ingestion | Digestion |
|---|---|---|
| Definition | The process of uptake of food is known as ingestion | The process of breaking complex organic molecules to derive nutrition and energy is known as digestion. |
| Dependent on enzymes | No<br>The process of ingestion does not involve the action of enzymes. | Yes<br>The process of digestion involves the action of enzymes. |
| ATP release and storage | No<br>Ingestion is ATP independent process. | Yes<br>Digestion involves synthesis and storage of ATP. |
| Part of human body involved | Mouth<br>Food is ingested with mouth in human. | Alimentary Canal<br>Food ingested is digested with stomach, small intestine and large intestine. |
| Complexity | Simple process | Complex process |

**Q. 1 C. Write differences between (AS1)**

**Light reaction – dark reaction**

**Answer :**

| Differences | Light reaction | Dark reaction |
|---|---|---|
| Dependence on light | Yes<br>Light reaction is dependent on the presence of light. | No<br>Dark reaction is independent of the presence of light. |
| Type of reaction | Energy harvesting | Synthesis reaction |
| ATP and NADPH | Light reaction results in ATP and NADPH production. | Dark reaction requires utilization of ATP and NADPH. |

**Q. 1 D. Write differences between (AS1)**

**Chlorophyll – chloroplast**

**Answer :**

| Differences | Chlorophyll | Chloroplast |
|---|---|---|
| Basic nature | Chlorophyll is a pigment. | Chloroplast is double walled organelle. |
| Role in photosynthesis | Chlorophyll harvest the sunlight, an essential component of photosynthesis. | Chloroplast contains all the enzymes and pigments required for photosynthesis. |
| Location | Chlorophyll is contained in the thylakoids in the chloroplast. | Chloroplast is a organelle located inside the plant cell. |

**Q. 2 A. Give reasons (AS1)**

**Why photosynthesis is considered as the basic energy source for most of living world?**

**Answer :** Photosynthesis is considered as the basic energy source for most of the living world because all organisms directly/ indirectly depend on the plants for their food and nutrition.

**Q. 2 B. Give reasons (AS1)**

**Why is it better to call the dark phase of photosynthesis as a light independent phase?**

**Answer :** The dark phase of photosynthesis can be called as light independent phase since it does not require sunlight. In fact, the dark reaction uses the ATP and NADPH generated in the light reaction to synthesize carbohydrate from carbon dioxide and water.

**Q. 2 C. Give reasons (AS1)**

**Why is it necessary to destarch a plant before performing any experiment on photosynthesis?**

**Answer :** It is important to destarch a plant before performing any experiment on photosynthesis so that it can be established whether or not a particular factor (carbon dioxide/ light/ water) is important for the photosynthetic reaction. Incase, the starch is already present in the leaves, it may lead to an erroneous interpretation.

**Q. 2 D. Give reasons (AS1)**

**Why is it not possible to demonstrate respiration in green plant kept in sunlight?**

**Answer :** During the day time (in the presence of sunlight), the plants performs two processes viz. photosynthesis and respiration. In photosynthesis, plants make sugars and oxygen from carbon dioxide and water while in respiration, the plants use sugars and oxygen to make carbon dioxide and water. The rate of photosynthesis is higher than the rate of respiration during the daytime. Hence, it is difficult to measure the rate of respiration in plants in daylight.

**Q. 3 A. Give examples (AS1)**

**Digestive enzymes**

**Answer :** Digestive enzymes are the enzymes that breakdown complex large molecules into simpler components. Trypsin is a digestive enzyme that hydrolysis proteins into peptides and amino acids that are readily absorbed. Amylase and lipase hydrolyze polysaccharides and lipids into monosaccharides and short chain organic molecules that are readily absorbed by the small intestine with the help of villi and microvilli.

**Q. 3 B. Give examples (AS1)**

**Organisms having heterotrophic nutrition**

**Answer :** Organisms having heterotrophic nutrition fail to synthesize their own food and hence, they depend on producers to obtain food/ nutrition. Deer and lion are examples of primary and secondary consumer and hence, they are heterotrophs.

**Q. 3 C. Give examples (AS1)**

**Vitamins**

**Answer :** Vitamins are small organic molecules not synthesized by the humans. The sources of vitamins are diet and bacteria present in the intestines.

The vitamins are either water soluble (Vit. B and C) or fat soluble (Vit. A, D, E, K).

**Q. 3 D. Give examples (AS1)**

**Nutritional deficiency diseases**

**Answer :** Nutrition deficiency diseases/malnutrition is often caused due to lack of intake of required amount of nutrients. There are of three different types of nutrition deficiency diseases namely calorie, protein and protein calorie malnutrition. Kwashiorkor and marasmus are most common nutrition deficiency disease found in underdeveloped / war affected countries.

**Q. 4. Where do plants get each of the raw materials required for photosynthesis? (AS1)**

**Answer :** The plants require three starting material for photosynthesis viz. water, sunlight and carbon dioxide. The water is absorbed by the roots of the plant. The water from roots through xylem reaches the site of photosynthesis. Carbon dioxide is taken by plants through stomata. Sun is the source of sunlight for plants.

**Q. 5. Explain the necessary conditions for autotrophic nutrition and what are its by products? (AS1)**

**Answer :** The necessary conditions for autotrophic nutrition are the presence of

**a)** chlorophyll, a pigment that absorbs sunlight.

**b)** Sun which serves a source of light

**c)** Water from the soil

**d)** Carbon dioxide from the atmosphere

The byproducts of autotrophic nutrition are sugars and oxygen.

**Q. 6. With the help of chemical equation explain the process of photosynthesis in detail with the help of a flow chart? (AS1)**

**Answer :** A balanced chemical equation of photosynthesis is given below.

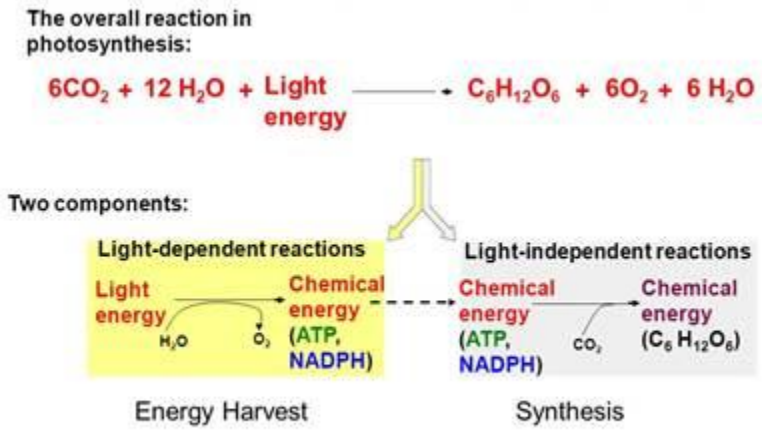



**Fig 1a shows the overall reaction of photosynthesis and its two components**

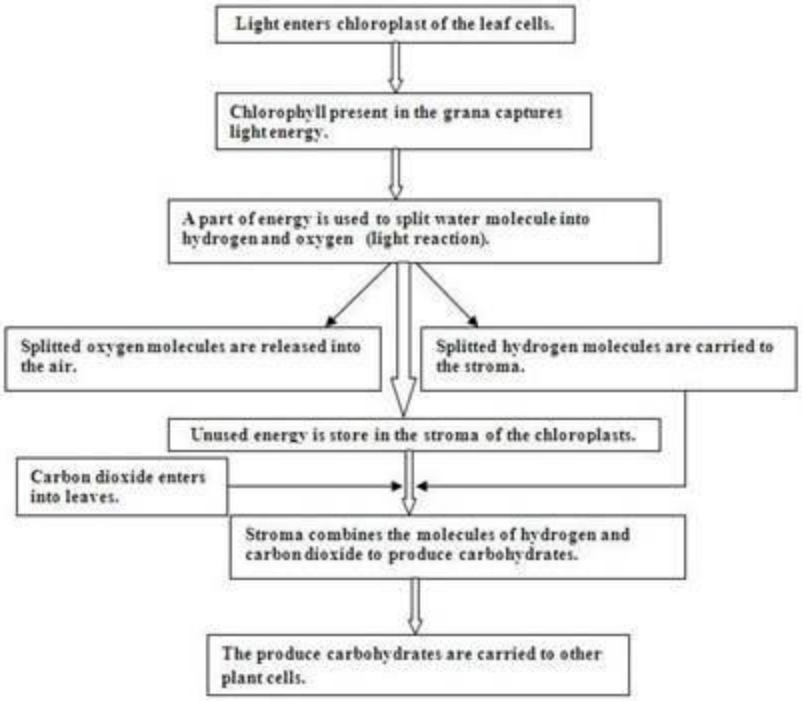



**Fig 1b shows the photosynthesis reaction in the flowchart**

**Q. 7. Name the three end products of photosynthesis? (AS1)**

**Answer :** Plants by the process of photosynthesis take up the atmospheric carbon dioxide in the presence of sunlight and water to produce sugar, oxygen and water, the three end products of photosynthesis.

**Q. 8. What is the connecting substance between light reaction and dark reaction? (AS1)**

**Answer :** The process of photosynthesis is divided into two steps namely light and dark reaction. In the light reaction, photosystem I and II (present in thylakoid membrane) harness the sunlight through series of steps to form NADPH and ATP. This NADPH and ATP is pumped in reactions catalyzed by the enzymes involved in dark reaction to form sucrose. Therefore, ATP and NADPH are connecting link between light and dark reaction (Fig 2).

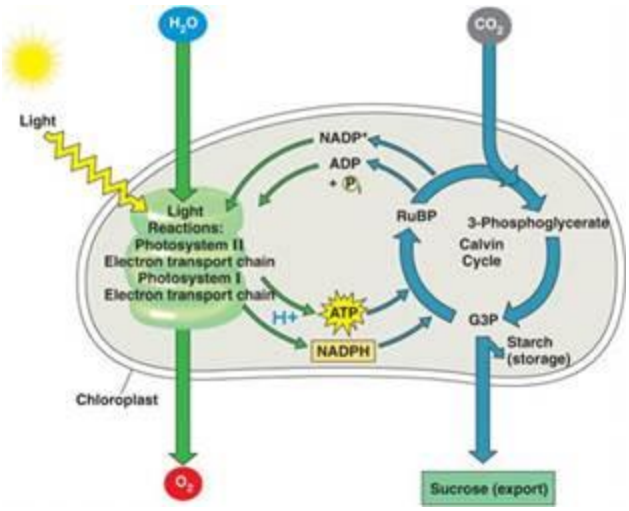



Fig 2 shows the connecting link between light and dark reaction of photosynthesis

**Q. 9. Most leaves have the upper surface more green and shiny than the lower ones why? (AS1)**

**Answer :** Most leaves have upper surface more green than lower one because the leaves contain more chlorophyll/ chloroplast on the leaf surface. The shine on upper surface of leaf is attributed by the presence of thick cuticle.

**Q. 10. Explain the structure of chloroplast with a neatly label sketch. (AS1)**

**Answer :** Chloroplast is a powerhouse for the synthesis of carbohydrates in plants. It is broadly divided into three parts (Fig 3) namely:

- **a)** Membrane: Chloroplast is double walled organelle viz. it contains inner and outer membrane.
- **b)** Stroma corresponds to the cytoplasm of chloroplast. It also serves as site for dark reaction of photosynthesis to take place.
- **c)** Thylakoids/ Granum: Thylakoids contains chlorophyll that absorbs light. Stacks of thylakoids are known as granum.

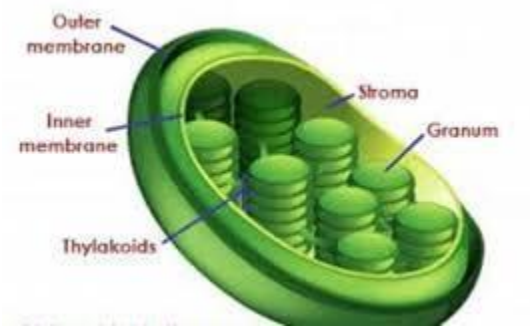



**Fig 3 shows different parts of chloroplast**

**Q. 11. What is the role of acid in stomach? (AS1)**

**Answer :** Gastric juice produced by the glands in stomach contains hydrochloric acid. The acid provides optimum acidic pH for the activity of pepsin, an enzyme known to hydrolyze proteins in the stomach.

**Q. 12. What is the function of digestive enzyme? (AS1)**

**Answer :** The function of digestive enzyme is to hydrolyze/ break the complex organic matter into simple substances. Lipase, trypsin and amylase are digestive enzymes that hydrolyze lipids, proteins and carbohydrates respectively.

**Q. 13. How is the small intestine designed to absorb digested food, explain. (AS1)**

**Answer :** The small intestine is designed to absorb digested food is a correct statement. It consists of many folds which are called as villi. Each villus (singular)/ villi (plural) is surrounded by many epithelial cells. Each epithelial cell consists of many more microvilli. Villi and microvilli (part of villi) (Fig 4) together increase the surface area in the intestine which aids in the absorption of nutrients.

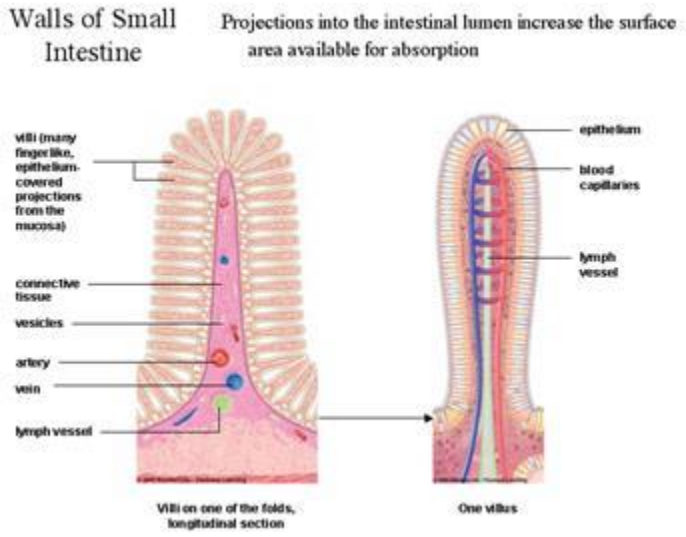



**Fig 4 shows villi and microvilli in the small intestine**

**Q. 14. How do fats digested in our bodies? Where does this process takes place? (AS1)**

**Answer :** The fat is digested in the small intestine. The small intestine requires bile juice from the liver and lipases from the pancreas to break down the lipids into smaller subunits.

The bile juice is produced in the liver and released in the small intestine. The bile salts form micelles by surrounding the fats/ lipids with their hydrophobic group inside and hydrophilic group outside. These micelles increase the surface area for digestion of lipids. The pancreatic juice produced in the pancreas and released in the small intestine consists of lipases which digest the micelles into small subunits.

**Q. 15. What is the role of saliva in the digestion of food? (AS1)**

**Answer :** The chewing of food causes mixing of the food with the saliva that activates salivary amylase, an enzyme known to hydrolyze polysaccharides into maltose.

**Q. 16. What will happen to protein digestion as the medium of intestine is gradually rendered alkaline? (AS1)**

**Answer :** The pH of intestine varies from 6.15- 7.88. This pH is optimum for the activity of proteases viz. trypsin to hydrolyze proteins into peptides and amino acids. If the pH of intestine is made more alkaline, it can eventually result in the inactivation of the proteases thus inhibiting the protein digestion.

**Q. 17. What is the role of roughages in the alimentary tract? (AS1)**

**Answer :** Roughages play an important role in the alimentary tract. These include

**a)** It prevents the accumulation of toxic substances in the rectum.

**b)** It helps in the peristaltic movements that allows the passage of food from stomach to intestine to rectum.

**c)** It has a characteristic water holding capacity.

**Q. 18. What is malnutrition. Explain some nutrition deficiency diseases. (AS1)**

**Answer :** Malnutrition is absence of one/ more nutrients from the food in desired amounts. Malnutrition can occur either because of presence of low calories/ proteins/ calories- proteins. Two most common nutrition deficiency diseases are

**a) Kwashiorkor:** It is caused due to intake of diet that contains either low/ no protein. The disease is characterized by poor muscle development, swollen body, swollen stomach, diarrhea and dry skin.

**b) Marasmus:** It is cause by the intake of diet containing low amounts of proteins and calories. The disease is characterized by dry skin, lean and weak body, visible ribs, and less developed muscles.

**Q. 19. How do non-green plants such as fungi and bacteria obtain their nourishment? (AS2)**

**Answer :** Many fungi and bacteria fall in the category of decomposers. viz. they obtain their food by breaking the organic matter present in the dead plants and animals. The decomposers play an indispensable role in ecosystem energy flow and biogeochemical cycle.

**Q. 20. If we keep on increasing $CO_2$ concentration in air what will be the rate of photosynthesis? (AS2)**

**Answer :** Carbon dioxide is an important component of photosynthesis. In general, an increase in the carbon dioxide levels increases the rate of photosynthesis. There is a linear increase in the rate of photosynthesis with increase in the carbon dioxide (Fig 5). However, an increase in carbon dioxide beyond the threshold does not affects the rate of photosynthesis (Fig 5).

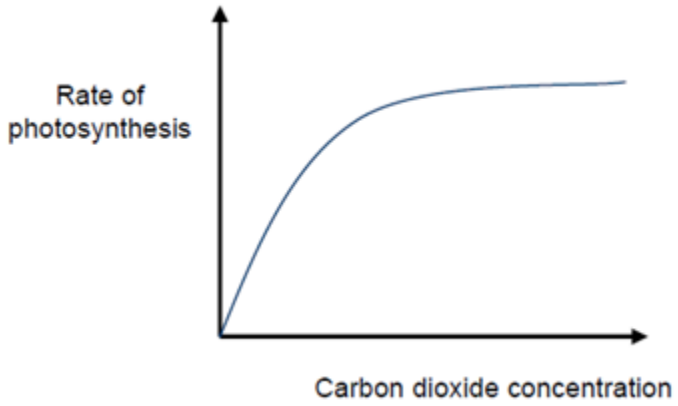



**Fig 5 shows relation between the rate of photosynthesis and carbon dioxide**

**Q. 21. What happens to plant if the rate of respiration becomes more than the rate of photosynthesis? (AS2)**

**Answer :** Under normal conditions, in presence of sunlight a plant has higher rate of photosynthesis than respiration. In the night, the same plant has zero photosynthesis and high rate of respiration. If the process of photosynthesis and respiration alternates during day and night respectively, the plant remains healthy. In adverse conditions, where plant exhibit much higher rate of respiration (a catabolic process- breakdown of glucose) than photosynthesis (anabolic process- synthesis of glucose), the plant is most likely to shed its dead/ senescent leaves. The senescent leaves correspond to the leaves with high respiration and zero/ very low photosynthesis.

**Q. 22. Why do you think that carbohydrates are not digested in the stomach? (AS2)**

**Answer :** The peristaltic movements push partially digested carbohydrates produced by the action of salivary amylase into stomach through esophagus. The gastric juices rich in hydrochloric acid lowers the pH of stomach to as low as pH-1.0. The acidic pH completely kills/ inhibit the salivary amylase. Hence, there is no digestion of carbohydrates in the stomach.

**Q. 23. What process you follow in your laboratory to study presence of starch in leaves? (AS3)**

**Answer :** Starch is a non- reducing sugar synthesized and stored in amylo-plasts in plants. The starch in the leaves on reaction with iodine solution (orange-brown) forms blue-black colored solution. The blue- black color is formed by entrapment of tri-iodide in starch.

**Q. 24. How would you demonstrate that green plant release oxygen when exposed to light? (AS3)**

**Answer :** To demonstrate the fact that the green plants release oxygen when exposed to light, create the set up as given in the Fig 6.

**a)** A beaker filled with water is placed in front of a lamp/ sunlight as shown in the Fig 6.

**b)** Place a green plant/ weed in an inverted funnel.

**c)** Place an inverted test tube on the funnel as shown in the Fig 6.

**d)** As the process of photosynthesis begins, oxygen bubbles can be seen in the water of the funnel and test tube. The presence of these bubbles is an indicator of process of photosynthesis. As we know that oxygen is a by-product of photosynthesis.

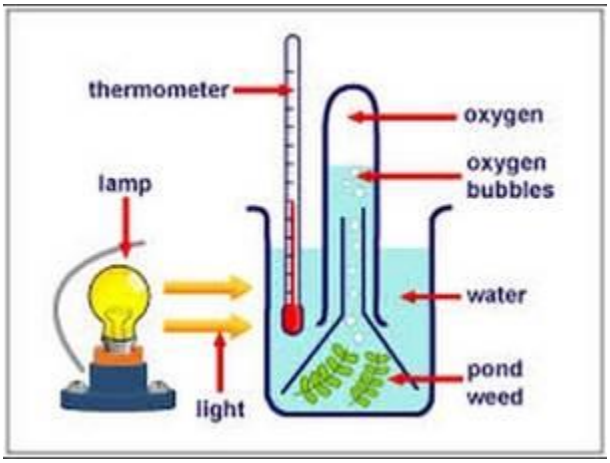



**Fig 6 shows green plants produce oxygen when exposed to light**

**Q. 25 A. Visit a doctor and find out keeping in view of digestion. Prepare a chart and display in your classroom. (AS4)**

**Under what condition does a patient need to become a drip of glucose.**

**Answer :** The patients are administered with a drip of glucose under two conditions namely:

**a)** When the patient is unable to ingest the food.

**b)** If the patient has undergone serious dehydration that results in excessive fatigue or loss consciousness.

**Q. 25 B. Visit a doctor and find out keeping in view of digestion. Prepare a chart and display in your classroom. (AS4)**

**Till when does a patient need to be given a glucose.**

**Answer :** The patients who are hypoglycemic viz the blood glucose is < 70 mg/ dl need glucose drips. Unless the blood glucose levels reach to >90 mg/ dl, the drips have to be continued.

**Q. 25 C. Visit a doctor and find out keeping in view of digestion. Prepare a chart and display in your classroom. (AS4)**

**How does the glucose help the patient to recover?**

**Answer :** Glucose helps the patient to recover since the breakdown of glucose generates ATP (energy) viz. essential for carrying out the life-processes.

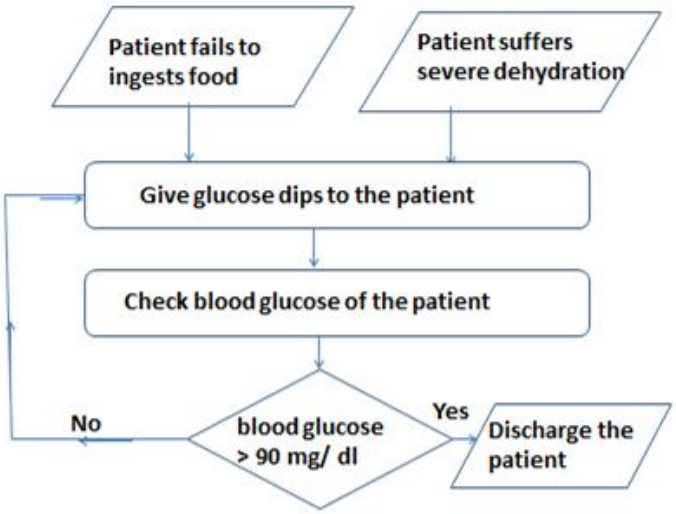



**Fig 7 shows the condition under which patient needs glucose dips**

**Q. 26. If there were no green plants, all life on the earth would come to an end! Comment? (AS5)**

**Answer :** Green plants are autotrophs viz. they synthesize their own food (sugars) using the basic molecules (carbon dioxide and water). All living organisms are directly or indirectly dependent on plants for their food, which provides them with energy and nutrition required to carry out different life- processes. In the simplest example of food chain of plants--- deer---- lion, deer is dependent on plants for its existence while lion is dependent on deer for its existence. Therefore, if there are no green plants on which deer can dwell, the deer population will eventually decrease to zero threatening the existence of lion too. Therefore, it is rightly said that if there are no green plants, all the life would come to an end.

**Q. 27. Draw a neatly labeled diagram of chloroplast found in leaf, and its role in photosynthesis? (AS5)**

**Answer :** Chloroplast is a double membrane organelle that is indispensable for the process of photosynthesis. Largely, chloroplast consists (Fig 8) of:

**a) Outer membrane:** A membrane that is permeable to small molecules.

**b) Inner membrane:** A membrane that contains transporter proteins for sucrose and phosphate precursors.

**c) Intermembrane space:** A space between outer and inner membrane of chloroplast.

**d) Stroma:** Stroma is the cytoplasm of chloroplast which serves a site for light independent reaction viz. it contains the enzymes required for Calvin cycle.

**e) Thylakoids:** Thylakoids are membrane bound organelles in chloroplast. The thylakoid membrane serves as a site for light dependent reaction viz. it contains enzymes that generate ATP and NADPH.

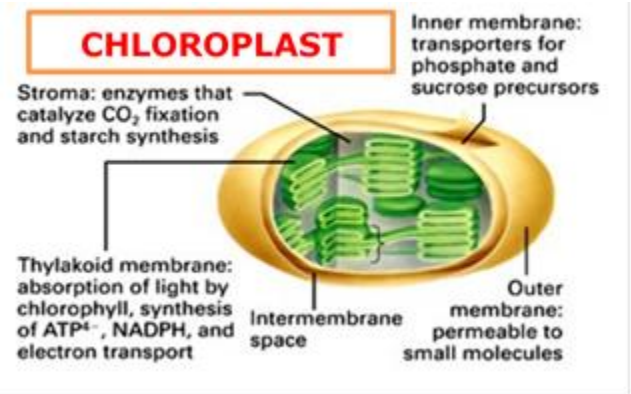



**Fig 8 shows the function of each part of chloroplas**

**Q. 28. Draw the label diagram of human digestive system? List out the parts where peristalsis takes place. (AS5)**

**Answer :** Peristalsis is defined as involuntary movements in longitudinal and circular muscles of digestive tract that aid in the process of digestion by pushing the food from esophagus to stomach and stomach to intestine. Fig 9 shows a detailed view of human digestive system.

a) **Esophagus:** In case of esophagus, the peristaltic waves travel along the entire length of the tube that allows to push the food into the stomach. One peristaltic wave requires 9 seconds to completely travel along the full length of the tube. The left-over food in esophagus is removed by the second peristaltic movement.
b) **Stomach:** The peristaltic movement in the stomach facilitates the mixing of the food with the gastric juices. It also aids in pushing the food into the small intestine. In case, the stomach is filled, the peristaltic waves stop completely. In cows viz. cud chewing animals, the food partially digested in the stomach goes back to the mouth by reverse peristalsis for chewing.
c) **Small intestine:** The peristaltic waves in small intestines are initiated/ generated by stimulation of smooth muscles of small intestine. The waves help in exposing the food for absorption by villi in the small intestine. It also aids in pushing the undigested food to the large intestine for elimination.
d) **Large intestine:** The peristaltic waves are continuous and they push the waste material to the end of anus. These waves also play an important role in controlling the bacterial growth and removing the gas from the large intestine.

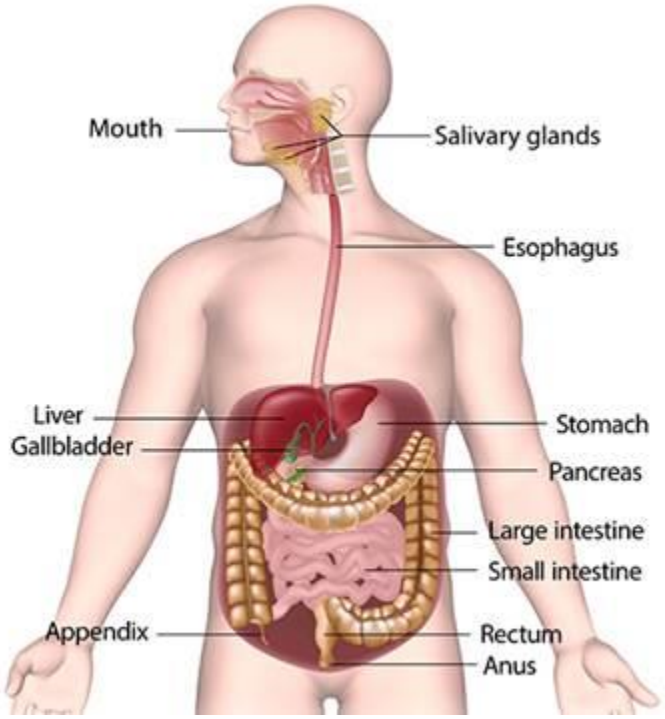
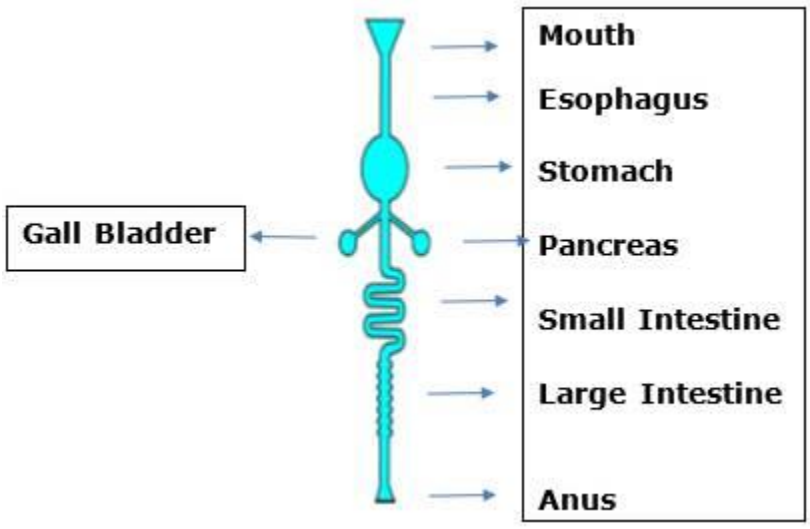



**Fig 9 shows different parts of human digestive system**

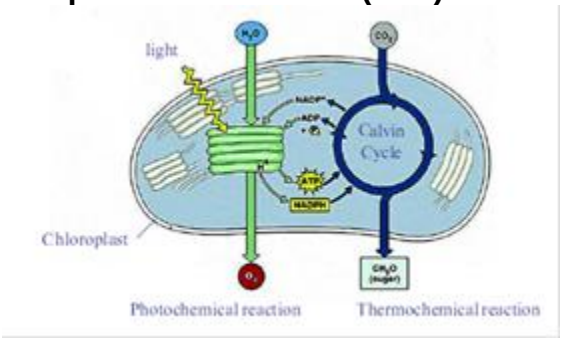
**Q. 29. Raheem prepared a model showing the passage of the food through different parts of the alimentary canal? Observe this and label it's parts. (AS5)**

**Answer :** There are different parts of alimentary canal namely

a) **Mouth-** Mouth contains saliva. It is rich in salivary amylase that hydrolysis polysaccharides to simple sugars.
b) **Esophagus-** It is a long narrow connecting tube between the mouth and stomach. Through, the peristaltic movements the food is pushed from mouth to the stomach.
c) **Stomach-** It contains proteases viz. trypsin that hydrolysis the proteins into simpler molecules. The pH of stomach is acidic which helps these proteases to work at their optimum pH.
d) **Pancreas-** It produces pancreatic juice which is released in the small intestine. The juice contains digestive enzymes viz. proteases, lipases and amylase that break proteins, lipids and sugars into small molecules.
e) **Small intestine-** It contains all types of hydrolases that produces small molecules. It also contains villi and microvilli that aids in the increased absorption of these small molecules.
f) **Large intestine-** It allows the absorption of water and storage of waste material as feces.
g) **Anus-** It the last part of the alimentary tract and the opening that allows the feces to be pushed out of the body by the means of peristaltic movement in the large intestine.



**Q. 30. Observe the following diagram and write a note on light dependent, light independent reactions. (AS5)**




**Answer : a) Light dependent reaction:** Chlorophyll, a pigment in the thylakoids absorbs light. The absorption of light splits water into oxygen and protons. The oxygen is released in the atmosphere while the protons are pumped through number of proteins to produce ATP and NADPH.

**b) Light independent reaction:** ATP and NADPH produced in light dependent reaction is used in the dark reaction through Calvin cycle to produce carbohydrates. The enzymes for the dark reaction of photosynthesis are present in the stroma of chloroplast.

**Q. 31. Almost all the living world depends on plants for food material. How do you appreciate the process of making food by the green plants? (AS6)**

**Answer :** All living organisms depend directly or indirectly on the plants for their food. The plants make their food (sugars) by the process of photosynthesis. Photosynthesis is a two-step process viz. light dependent and light independent reaction. The light dependent reaction involves harnessing sunlight and producing ATP and NADPH which is utilized in light independent reaction to synthesize sugars. Consider, the food web in Fig.10, caterpillar, rabbit and grasshopper (primary consumers) are dependent on green plants for their food. While higher animals viz. snake, hawk and blue jay (secondary consumers) are dependent on primary consumers. Therefore, if green plants are eliminated from the ecosystem, primary and secondary consumers will starve and die viz. complete food web will collapse if the plants are eliminated. Therefore, plants are indispensable for the existence of every/ almost every living organism on earth.

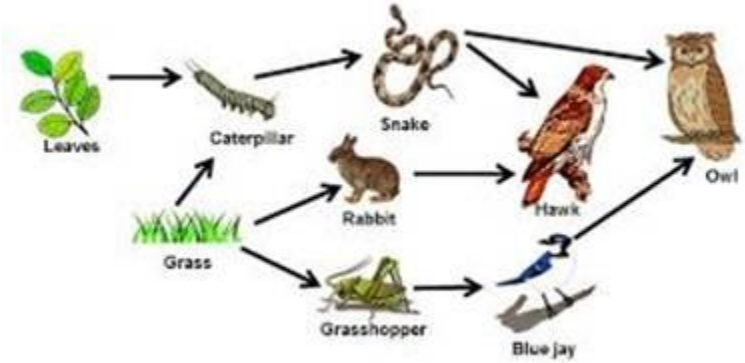



**Fig 10 shows different components of food web**

**Q. 32. Even a hard-solid food also becomes smooth slurry in the digestive system by the enzymes released at a particular time. This mechanism is an amazing fact. Prepare a cartoon on it. (AS6)**

**Answer :**

Fig 11 shows the mechanism of digestion

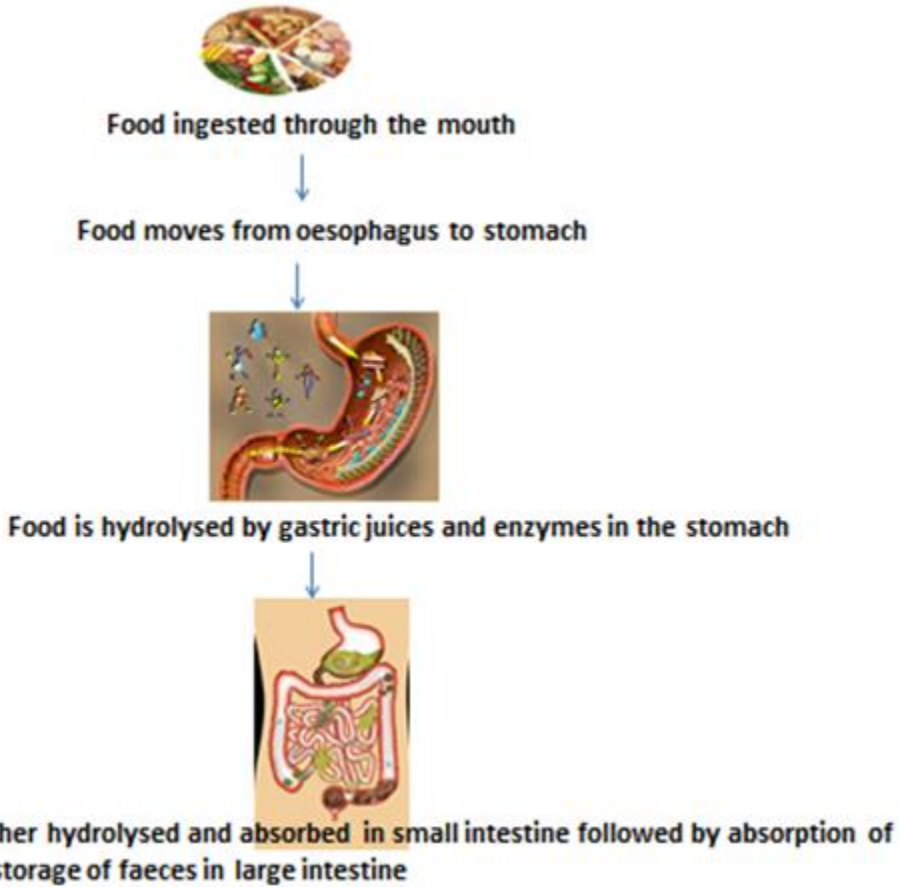



Fig 11 shows the mechanism of digestion of food in human beings

**Q. 33. What food habits you are going to follow after reading this chapter? Why? (AS7)**

**Answer :** The importance of different components of food viz. fats, carbohydrates, proteins, vitamins, minerals and roughages can be appreciated after reading the chapter. Healthy habits learnt from the chapter are:

**a)** Taking balanced diets- Absence of vitamins in the diet can lead to malnutrition/ diseases associated with deficiency of vitamins.

**b)** Taking food on time- If the food is not taken at proper time, it may cause acidity and ulcers in the stomach.

**c)** Chewing the food- Chewing of food is very important since it allows mixing of food with enzymes preset in saliva viz. the enzymes that aids in digestion.

**d)** Eating the meals slowly- If the food is consumed in a hurry, it may result in improper digestion and hence flatulence.

**e)** Avoiding exercises before and after the meals.

**f)** Drinking plenty of water

**g)** Including roughages in diet- Roughages aids in bowel movement.

## Fill in the blanks

**Q. 1. Fill in the blanks**

**The food synthesized by the plant is stored as _____.**

**Answer :** The food synthesized by the plant is stored as starch.

**Explanation.**

The process of photosynthesis facilitates the synthesis of simple sugars viz. glucose which is converted into starch, a carbohydrate for long term storage of sugars.

**Q. 2. Fill in the blanks**

**_____ are the sites of photosynthesis.**

**Answer :**

Chloroplast are the sites of photosynthesis.

**Explanation.**

Chloroplast consists of thylakoids. Thylakoids in turn consist of chlorophyll, a pigment that absorbs light and is important for the light dependent reaction.

**Q. 3. Fill in the blanks**

**Pancreatic juice contains enzymes for carrying the process of digestion of _____ and _____.**

**Answer :** Pancreatic juice contains enzymes for carrying the process of digestion of proteins and carbohydrates.

**Explanation.**

The pancreatic juice contains amylase, trypsin and lipase that are released in duodenum (part of small intestine) that digests carbohydrates, proteins and fats respectively.

**Q. 4. Fill in the blanks**

**The finger like projections which increases the surface area in small intestine are called ….**

**Answer :** The finger like projections which increases the surface area in small intestine are called villi.

**Explanation.**

The small intestine consists of many folds which are called as villi. Each villus (singular)/ villi (plural) is surrounded by many epithelial cells. Each epithelial cell consists of many more microvilli. Therefore, villi and microvilli (part of villi) dramatically increase the surface area in the intestine for the absorption of nutrients (Fig 12).

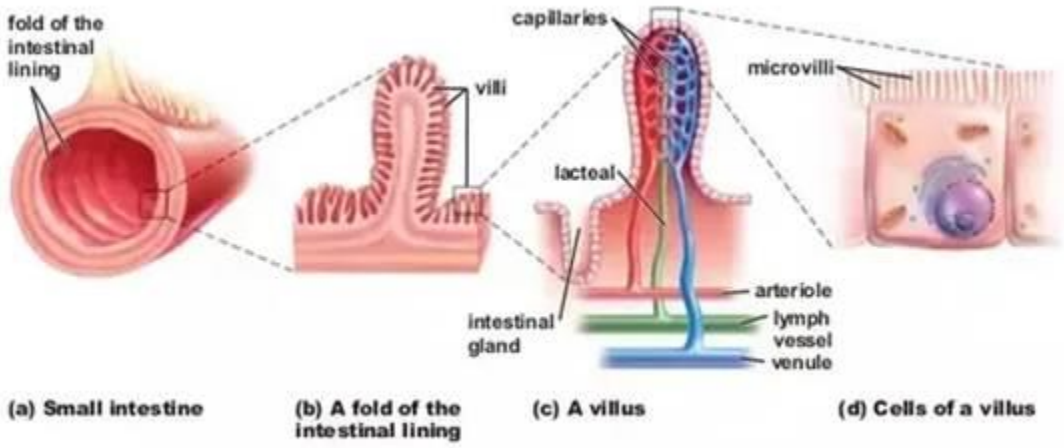



**Fig 12 shows the anatomy of small intestine and villi**

**Q. 5. Fill in the blanks**

**The gastric juice contains …..acid.**

**Answer :**

The gastric juice contains hydrochloric acid.

**Explanation.**

The gastric glands in the stomach secretes gastric juice which contains hydrochloric acid, pepsin, rennin, and mucous. Hydrochloric acid provides an optimum pH (1-3) for the catalytic activity of pepsin. Pepsin hydrolysis proteins. Mucous in the gastric juice prevents the damage of epithelial lining of the stomach from acidic nature of gastric juice.

**Q. 6. Fill in the blanks**

**…….vitamin is synthesized by bacteria present in intestine.**

**Answer :**

Fat soluble vitamin is synthesized by bacteria present in intestine.

**Explanation.**

Fat soluble vitamin viz. Vitamin K is synthesized by the bacteria residing in our large intestine. Vit. K is indispensable for synthesis of biologically active clotting and anti-clotting proteins.

## Choose the correct Answer

**Q. 7. Choose the correct answer**

**Which of the following organisms take the food by parasitic nutrition? ( )'**

**A. Yeast**
**B. Mushrooms**
**C. Cuscutta**
**D. Leeches**

**Answer :**

The plants that serve as parasite extract the nutrients from the host without benefitting the later. In general, Cuscuta wraps itself around the host and produces haustoria that helps Cuscuta to insert itself into the vasculature of the host. It serves as a parasite on potatoes, alfalfa, dahlia and flax.

**Q. 8. Choose the correct answer**

**The rate of Photosynthesis is not affected by:( )**

**A. Light Intensity**
**B. Humidity**
**C. Temperature**
**D. Carbon dioxide concentration**

**Answer :**

The rate of photosynthesis (light dependent reaction) is directly proportional to the light intensity, temperature and carbon dioxide concentration. The rate of photosynthesis (light independent reaction) increases with temperature/ carbon dioxide concentration/ light intensity.

**Q. 9. Choose the correct answer**

**A plant is kept in dark cupboard for about forty eight hours before conducting any experiment on Photosynthesis in order to:( )**

**A. Remove chlorophyll from leaves**
**B. Remove starch from leaves**
**C. Ensure that no photosynthesis occurred**
**D. Ensure that leaves are free from the starch**

**Answer :** It is important to destarch/ remove the starch from the leaves before starting experiment on photosynthesis since use of destarched leaf can only prove that light/ carbon dioxide is indispensable for photosynthesis.

**Q. 10. Choose the correct answer**

**The digestive juice without enzyme is ()**

**A. Bile**
**B. Gastric juice**
**C. Pancreatic juice**
**D. Saliva**

**Answer :**

Bile juice is produced in the liver, stored in gall bladder and released in the small intestine for the digestion of fats. The bile juice consists of water, bile salts and bilirubin in 97%, 0.7% and 0.2% respectively. Bile salts are amphiphilic molecules viz. it contains both hydrophobic and hydrophilic groups. The bile salts form micelles by surrounding the fats/ lipids with their hydrophobic group inside and hydrophilic group outside (Fig 13B). These micelles increase the surface area for digestion of lipids by the lipase viz. pancreatic lipase which is produced by the pancreas (Fig 13A).

**A.**

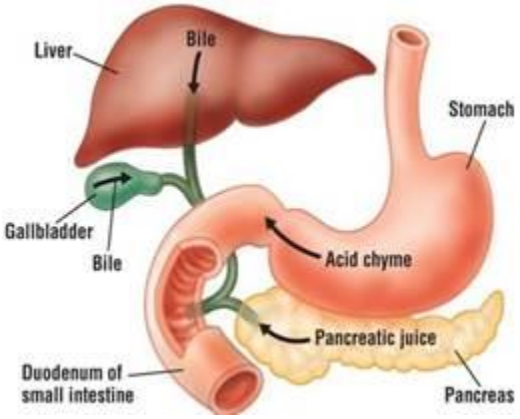



**Fig 13A shows the anatomy of digestive system.**

**B.**

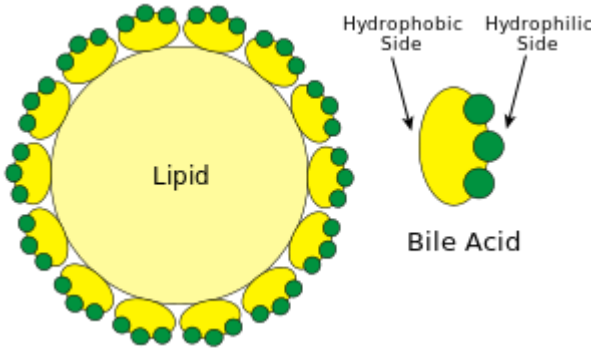



**Fig 13B shows the formation of micelles by bile with lipids**

**Q. 11. Choose the correct answer**

**In single celled animals, the food is taken ()**

**A. By the entire body surface**
**B. Mouth**
**C. Teeth**
**D. Vacuoles**

**Answer :** Single celled organisms viz. *Amoeba* takes up the food with the help of special extensions (pseudopodia) present on its entire body surface. These pseudopodia forms food vesicle upon fusion with food (Fig 14).
Similarly, *Paramecium* takes the help of cilia on its body surface for the update of the food. The process of uptake of food by the living organisms becomes more complicated in multicellular organisms.

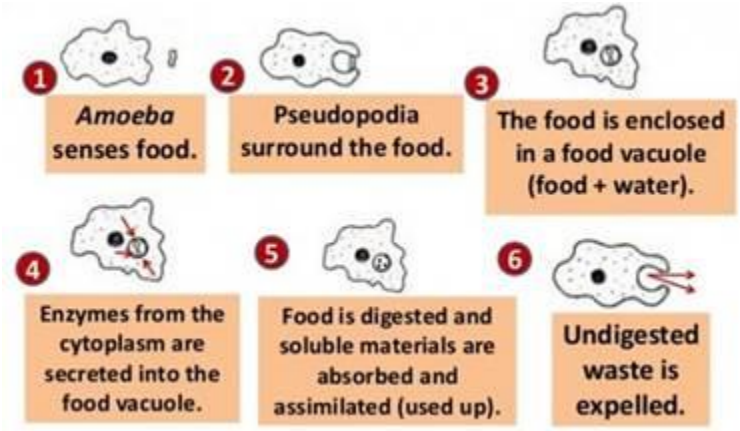



**Fig 14 shows the process of uptake of food by Amoeba**

**Q. 12. Choose the correct answer**

**Which part of the plant takes in carbon dioxide from the air for photosynthesis ( )**

**A. Root hair**
**B. Stomata**
**C. Leaf veins**
**D. Sepals**

**Answer :** Stoma (singular)/ Stomata (plural) are the small pores in the plant's leaf epidermis that allows the exchange of gases (carbon dioxide and oxygen) between the external environment and plants. A stoma is surrounded by two guard cells. These guard cells take up the water by osmosis that forces the stoma to open. The opening of stoma allows the uptake of carbon dioxide from the environment (Fig 15).

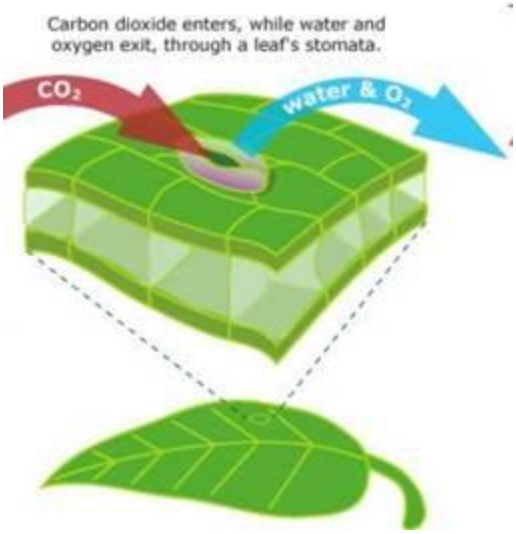



**Fig 15 shows the process of uptake of carbon dioxide by stoma in the leaves**