

1. NUTRITION-THE FOOD SUPPLYING SYSTEM

Q) Raju Said Dark reaction occasionally during night time but Krishna said dark reaction occurs even during day time. Who is correct? Explain about the photosynthesis in detail?

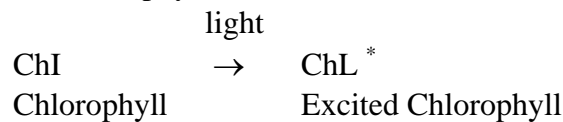
A. Dark reaction occurs even during day time but it doesn't utilise light. Krishna is correct.

Q) In which phase of Photosynthesis the O₂ is liberated?

A. Light reaction.

Q) Light of water plays an important role in light dependent reaction- comment

A. Light- A small unit of energy 'Photon' is required to initiate the photosynthesis as it is absorbed by the chlorophyll molecule.



Excited Chl is used to split the H₂O Molecule (Photolysis) $\text{H}_2\text{O} \rightarrow \text{H}^+ + \text{OH}^-$

Q) Why proteins are not digested in the mouth?

A. Proteins are not digested in the mouth because enzymes for protein digestion are not available in saliva.

Q) A student went to a doctor, As the student is too fat.

Q) The doctor confirmed that the student is suffering from obesity.

Q) What is the reason for this health hazard?

A. Over eating or excess intake of energy.

Q) An obese student may suffer from Diseases in future. What are they?

A. Diabetes, Cardiovascular disease, Renal disease, Gall bladder problem etc.

Q) What advise did doctor suggest to that student.

Not to consume oil rich food (or) Junk food which adds more fat to the body weight

A. What essential components are required for a human being?

Oxygen, Water, Food, Shelter etc.

Q) What components play an important role in Building (or) Maintaining (or) Supporting of our Life?

A. Oxygen, food.

Q) What is the source of energy?

A. Food.

Q) From where do we get food?

A. Plants, Animals etc.

Q) What do food contain?

A. Food contain some essential components which are require for growth. and development

Q) The mode of obtaining nutrients is called ?

A. Nutrition.

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NUTRITION- FOOD SUPPLYING SYSTEM

1. What are Autotrophs? How do Autotrophs get their Nutrition?

- A. 1) Autotrophs are the organisms capable of using solar energy (Sunlight) to synthesize chemical compounds.
- 2) Autotrophic nutrition involves the intake of simple inorganic materials like some minerals, Water from the soil as well as some gases from the air and using an external energy source Like the sun to synthesize complex high energy organic material.
- 3) Autotrophic nutrition takes place in green plants and some photosynthetic bacteria which can carry out photosynthesis Eg :- Plants, Algae
- 4) Autotrophs can synthesize carbohydrates, Protein, Lipids these are energy giving molecules
- 5) Every living organism either directly or indirectly depends on plants to obtain energy.

2. Why plants are called autotrophs and universal food providers?

- A. 1) Green plants can prepare their own food because of presence of chlorophyll so they are called as autotrophs.
- 2) Plants carry out an important life process called photosynthesis and serves as energy for other living organisms, Hence plants are called as “ **Universal Food Providers**”.
- 3) Van Helmont and other scientists believed that plants get their food material not only from soil but also from other sources.

Q) Why plants are called as “ Universal Food Providers”? How do they prepare their own food material?

Q) Why only green plants are capable of preparing their own food material?

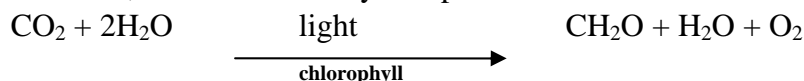
- A) Plants obtain their food by the process of photosynthesis .It is a complex process in which simple inorganic substances are converted into complex energy rich organic substances by using light energy and chlorophyll pigment ,which is not possible in other living organisms.

Q) Why plants are green in colour?

Plants are green in colour because of excitation of chlorophyll pigment present in the chloroplast during photosynthesis.

Q) Define photosynthesis with an equation?

By using raw materials CO₂ , water and sunlight an equation was developed by C.B. Van Neil, which was readily accepted



Balanced Equation :



- A. 1. Photosynthesis may be defined as photo chemical reaction during which carbohydrates are formed from carbon dioxide , water and chlorophyll in presence of sunlight .
2. Later glucose is converted to starch.

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Q) In what form glucose is stored in green plants and transported?

A. During photosynthesis glucose is formed in leaves and stored as starch in phloem tissue and transported to all parts of the plants.

Q) What are the simple and complex forms of carbohydrate?

A. a) Glucose b) Starch

Q) Do bacteria also performs Photosynthesis?

A. Not all bacteria, for Eg : Purple Sulphur bacteria (containing chlorophyll) performs photosynthesis and uses H_2S instead of H_2O .
Eg : Cyanobacteria

Q) How raw materials play an important role in photosynthesis?

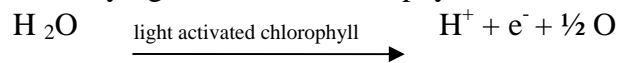
- 1) CO_2 is reduced to form carbohydrates.
- 2) Chlorophyll absorbs light energy, gets excited and initiate photolysis reaction.
- 3) H_2O is Oxidised to form Oxygen, Protons (H^+) and electrons (e^-) and helps in formation of ATP (Adenosine Tri Phosphate) and NADPH (Nicotinamide Adenine Di-nucleotide Hydrogen Phosphate)

Q) What is liberated in purple Sulphur bacteria?

A. As this bacteria utilizes H_2S it releases elemental sulphur
Light plays an important role in photosynthesis as it provides energy.

Q) Who proved that Oxygen is released during Photosynthesis and How?

A. Robert Hill proved that O_2 is released during photosynthesis by splitting the H_2O molecule by light activated chlorophyll and O_2^* is released.



Q) Do non green plants (Fungi) prepare their own food material by photosynthesis

A. No.

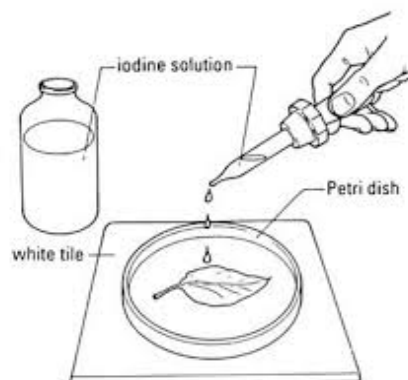
Q) What is present in leaf which is important for photosynthesis?

A. Green coloured pigment (Chlorophyll)

Q) Is chlorophyll an important pigment for starch formation?

A. Yes.

Q) How do you prove that starch is formed only in plants which are green in coloured ?



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A. 1) Select a leaf from a plant and put it in a test tube containing methylated spirit. (Alcohol)



2) Arrange a water bath & place the above test tube & boil it for sometime



3) The leaf (green initially) turns in to **Pale Yellow** colour as it loses the chlorophyll pigment on heating



4) Test the experimented leaf , by adding few drops of tincture iodine solution



5) Pale yellow coloured leaf turns in to blue- black colour indicating the presence of starch.

Q) What is the colour of the iodine solution and give the equation for experiment

A) Iodine (Brown colour) + Starch → Blue Black colour

Q) What is the reason for boiling the leaf with the help of water bath?

A) To remove the chlorophyll pigment molecule and make leaf pale to determine the presence of starch with iodine.

Q) What are the materials required for photosynthesis.

A. Scientists worked for 300 years to know that CO₂, H₂O and Sunlight and chlorophyll are required for photosynthesis as raw materials.

Q) Do the plant body mass increases ?

A) Yes.

Q) What helps the plants to increase its body mass?

A. Raw materials

Q) Who is the scientist stated that plant body mass increases by water?

A. 1) Earlier **Von Helmont** stated plant body mass increases due to **Water**.
2) Later it was confirmed that plant body mass increases by other factors like soil, light and chlorophyll during photosynthesis by many other scientists.

1. Write differences between.

A) **Autotrophic nutrition – Heterotrophic nutrition:**

Autotrophic nutrition	Heterotrophic nutrition
1. Organisms that can prepare their own food.	1. Organisms that can not prepare their own food and depend on other organisms
2. Food is prepared from CO ₂ ,water ,Sun light and chlorophyll.	2. Food can not be prepared from CO ₂ ,water ,Sun light and chlorophyll.
3. Ex : Green plants, photo synthetic bacteria etc.,	3.Ex : Animals Fungi ,Bacteria etc.,

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Q) Which gas is essential for Photosynthesis and from where do plants obtain that gas?

A. CO₂, Air (0.04%)

Q) Which gas is required by Human Beings for Survival? Where do Humans get this from?

A. Oxygen, humans get this gas from plants which is a by product of photosynthesis. Plants release O₂ in to the atmosphere.

Q) Which gas is released as the by product from plants and by which mechanisms plants are able to release it?

A. O₂ By the process of photolysis during photosynthesis.

Q) Who discovered and coined the name oxygen?

A. Oxygen was discovered by Priestly .

Q) Who coined the term oxygen?

A. The term oxygen was coined later by Lavoiser (1775).

Q) Write an experiment conducted by priestly to show plants restore gases?

A.

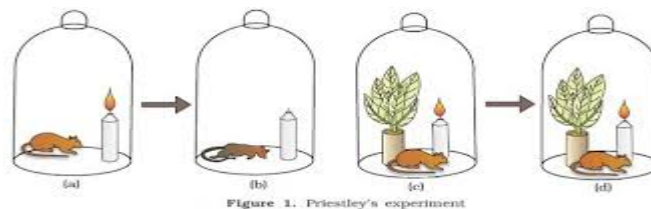


Figure 1. Priestley's experiment

→ Priestly observed that a candle cannot continue burning, A mouse cannot survive for a longer time if placed in a closed bell jar and he concluded that these damage the air. He then introduced a mint plant in which he observed the burning of the candle and the rat stayed alive.

→ **Priestly hypothesized as follows** : - Plants restore air , what breathing animals and burning candle removes is CO₂

→ The release of gas from a plant supported the burning candle and made the rat stay alive is oxygen.

Q) How plants are capable of exchanging gases through stomata.

A. Plants carry out gaseous exchange mostly through stomata present in leaves and also by loosely arranged tissues on stems, called lenticels and root hairs etc.

Q) Write an activity to prove that carbondioxide is essential for photosynthesis.

Activity-2

Aim :Carbon dioxide is necessary for Photosynthesis :-

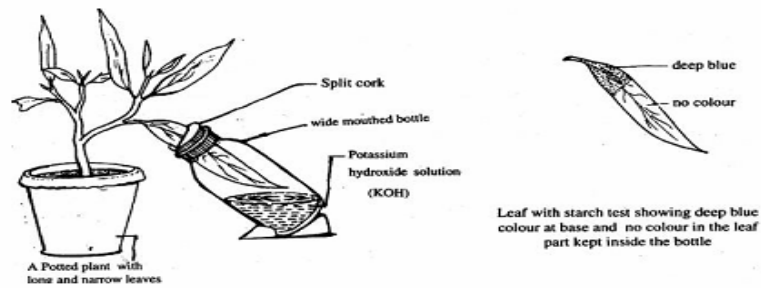
Apparatus :wide mouth bottle , KOH solution, potted plant , water , iodine, spirit,

Procedure :Destarch a plant which is healthy and containing long narrow leaves (Destarch- Keeping the plant in dark condition for about one week) Insert one destarched leaf in to the transparent bottle containing 5-10ml of KOH solution.

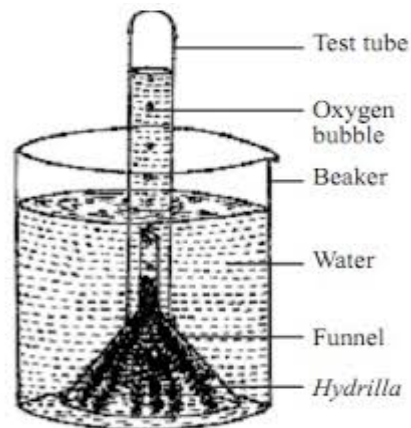
Only half Leaf is inserted in to the bottle through splitted cork, place the apparatus in sunlight for few hours.

Detach the experiment leaf and test it with 'iodine' for starch test.

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- Q) Which part of the leaf turns into blue – black colour, if why?**
A. The leaf which is exposed to sunlight i- e; outside the transparent bottle shows blue - black colour as it utilises the raw material CO_2 for photosynthesis.
- Q) What happens to the leaf which is present inside the transparent bottle.**
A. The part of the leaf inside the transparent bottle didn't show blue- black colour.
- Q) What is the main advantage of using KOH solution**
A) KOH absorbs CO_2 present inside bottle.
- Q) Why is it necessary to destarch a plant before performing the experiment?**
A. To have a clear identification of blue colour during starch test.
- Q) Write an experiment to prove that O_2 is evolved during photosynthesis in presence of light?**
A.



Aim: Oxygen is produced during photosynthesis in the presence of light

Apparatus: Beaker, funnel, hydrilla, water, test tube and burning splinter.

Procedure:

- 1) Collect few hydrilla / elodia twigs (Submerged plant) and place it in a funnel
- 2) Place the funnel containing twigs in an inverted position in a beaker containing water
- 3) Place a test tube full of water over the stem of the funnel and keep the apparatus in the sunlight for 2-3 hours.
- 4) Remove the test tube carefully from the stem of the funnel.

Observation:

- Q) What precautions do you follow while removing test tube from the beaker?**
A. Remove the test tube slowly from the beaker and close the mouth of the test tube immediately as we take the test tube out of the water, to prevent the escape of collected gas.

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Q) Where is the oxygen gas collected?

A. The oxygen gas is collected at the top of the test tube

Q) How do you test that the gas collected is oxygen?

A. Expose the mouth of the test tube to a burning match stick, the flame burns more vigorously as the flame reacts with oxygen

Q) Why the apparatus is kept in sunlight.

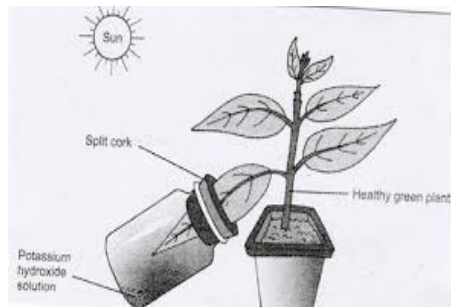
A. The apparatus is kept in sunlight for 2-3 hours so as to perform photosynthesis.

Q) What happens if the experimental apparatus is not placed in sunlight.

A. The leaf cannot utilize light, hence it cannot perform photosynthesis

Q) Write an experiment to prove that CO₂ is essential for photosynthesis.

A.



Q) Who discovered this experiment ? and why it is named

A) molls half leaf experiment

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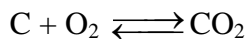
Q) Write about scientists for role of light during photosynthesis?

Q) How does plant obtain energy for photosynthesis?

From sunlight.

→ Scientists didn't understand much about energy during Priestly time. Later on much was discovered.

→ Energy is required to form a molecule and also to dissociate a molecule,



→ Even oxygen formation would use up energy.

Q) Do aquatic plants release oxygen?

Yes.

→ A dutch scientist **Jan Ingenhousz** studied the formation O₂ only during the daytime.

→ He performed an experiment in an hydrilla plant (Submerged aquatic plant) he observed generation of small bubbles during daytime and didn't show during night time, the bubbles contained O₂ gas.

→ **Engelman** detected the maximum rate of photosynthesis he exposed a strand of algae to different colours of light

→ He then used O₂ sensitive bacteria and they crowded around areas illuminated with red and blue rays of light.

→ This confirmed the role of light in photosynthesis is important .

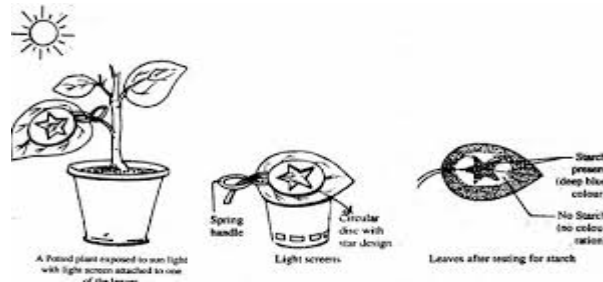
Different coloured compounds called accessory pigments are also important during photosynthesis

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- Ingenhousz in mid 20th century could propose green parts in plants carry on photosynthesis.
- Pelletier and caventou extracted chlorophyll and other pigments help in photosynthesis.
- Julius von sachs observed green pigment chlorophyll is present with in the chloroplast only but not through the entire cell.

Q) Write an experiment to prove that sunlight is necessary to form starch in green plants.

A.



Destarch a potted plant and select a leaf from it.

Place a black colour sheath on which a design is cut, on one of the leaf

Place the apparatus in sunlight for few hours.

Test the experimented leaf with iodine solution.

Q) Which part of the leaf turns blue

A) The portion of the leaf which received light turns into blue- black colour. Indicating photosynthesis was carried out.

Q) Which part of the leaf didn't show blue – black colour

A) The portion of the leaf which was covered with black coloured paper didn't show blue- black colour.

Q) Do photosynthesis occur in the presence of sunlight

A) Yes, to initiate the process of photosynthesis light is required

Q) Write about scientific history of chlorophyll necessary for photosynthesis

A. Pigment present in chloroplast which is responsible for green colour in plants .

Is chlorophyll

Ingenhousz carried out experiment about photosynthesis and stated that only green plant parts could carry out photosynthesis.

Ingenhousz proposition came after several experiment (Mid 20th Century), although the scientist could isolate the site of photosynthesis.

After 4 decades of **Ingenhousz** proposition, scientist could know more about green substance in plants.

Pelletier and caventou →extracted chlorophyll pigment other pigments also help in the process of photosynthesis.

Where does photosynthesis take place?

Tulius von sachs observed green pigment 'chlorophyl' is present with in the Chloroplast only but it is not spread through the entire cell.

40-100 Chloroplast molecules are present within a cell of mostly observed in stomatal guard cells and ground tissues of plants.

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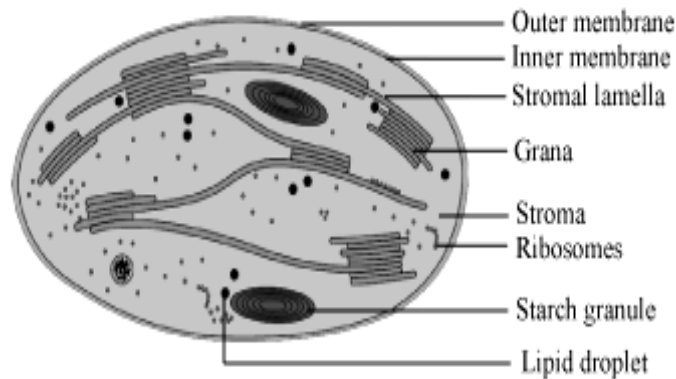
Q) Explain about a cell organelle in which plants Prepare their own food material ?

A) **Chloroplast** is isolated carefully by “Daniel. I . Arnon” (1954)

Double membraned structure, consisting of granum – (3rd Layer)

Thylakoids are arranged one above the another forming stacks called granum to carry on Light reactions – Trapping the light Energy

Stroma → Fluid filled portion, where enzymatic reactions occur , site for - dark reaction – synthesis of starch.



→ Photosynthetic pigments present in the grana also aid in the process of photosynthesis.

Chl , has Mg^{+2} of Hb has Fe^{+2}

Chl 'a' → Blue green

Chl 'be' → Yellow green

250 to 400 Pigment molecules are grouped to Light Harvesting Complex.

Q) Differentiate between Haemoglobin and Chlorophyll?

A. Haemoglobin contains Fe^{+2} of chlorophyll contain Mg^{+2} as central atom.

Q. Write difference between light reaction and dark reaction.

B) Light reaction – Dark reaction :

A

<i>Light reaction</i>	<i>Dark reaction</i>
1) Light reaction occurs in gana of chloroplast	2) Dark reaction occurs in stroma of chloroplast
2) ATP & NADPH, O_2 are end products of light reaction	2) Glucose is an end product
3) Photolysis of water molecule take places and helps in formation of ATP & NADPH	3) CO_2 is reduced to glucose called carbon fixation.
4) Occurs only in the presence of light.	4). It is not dependent on light.

3. What is the connecting substance between light reaction and dark reaction ?

A. ATP (Adenosine Tri Phosphate) and NADPH (Nicotinamide adenosine Dinucleotide Hydrogen Phosphate) are the connecting substance between light reaction and dark reaction.

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Write about Mechanism of Photosynthesis:-

- (i) Conversion of light energy to chemical energy
 - (ii) Splitting of water molecule
 - (iii) Reduction of carbondioxide to carbroydrates.
- I Light reaction –(Photo Chemical Phase) – Occurs in 3 Steps
Requires sunlight as an energy.
Occurs in the ‘Grana of the Thylakoid.
- (i) Step –I : Activation of chlorophyll pigment :
Photon – Smallest unit of energy

By absorbing

Chlorophyll by absorbing photon chlorophyll* Looses an electron →
(ground state) (Excited state) chlorophyll⁺
(oxidized state +e⁻)

- (ii) Step – II, Splitting of water molecule :- (Photolysis)
 $2\text{H}_2\text{O} \rightarrow 4\text{H}^+ + 4\text{e}^- + \text{O}_2$.
By using oxidizing power of chl⁺, Water gets splits of there by releasing O₂.
This equation was formulated by Robert Hill and it is known as “Hill’s reaction”.
- (iii) Pathways of H⁺
H⁺ ions are used up in dark reaction (undergoes a Series of Reaction
ATP (Adenosine Tri phosphate) and NADPH (Nicotinamide Adenine Dinucleotide
Hydrogen Phosphate) These molecules trap the energy and are the end products of
light reaction

II $\text{ADP} + \text{Pi} + \text{Energy} \rightarrow \text{ATP}$
 $\text{NADP}^+ 2\text{e}^- + 2\text{H}^+ \rightarrow \text{NADPH} + \text{H}^+ \rightarrow \text{NADPH}_2$
ATP & NADPH → Assimilatory powers

Q) A Student observed a plant grown during rainy season. Which is non- green in colour

a) What kind of nutrition does it show ?

- A) Saprophytic
- b) These kind of organisms belong to kingdom?
- A) Fungi
- c) These organisms generally feed on?
- A) Dead and decaying organisms
- d) How do they obtain nutrition?
- A) By releasing enjymes breaks the complex molecules into simple molecules.
- e) Eg :- Mushroom, bread mould .

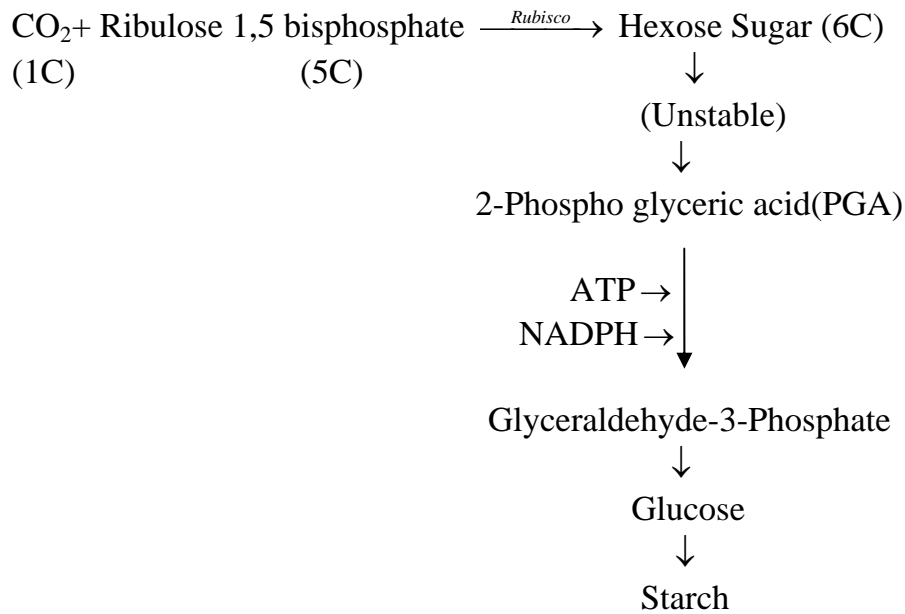
Q) Write about ‘Carbon ‘ fixation cycle in the photosynthesis.

Q) In which reaction more enzymes are used for photosynthesis.

Q) Dark reaction occurs without depending on light then, How energy is supplied to produce glucose molecule.

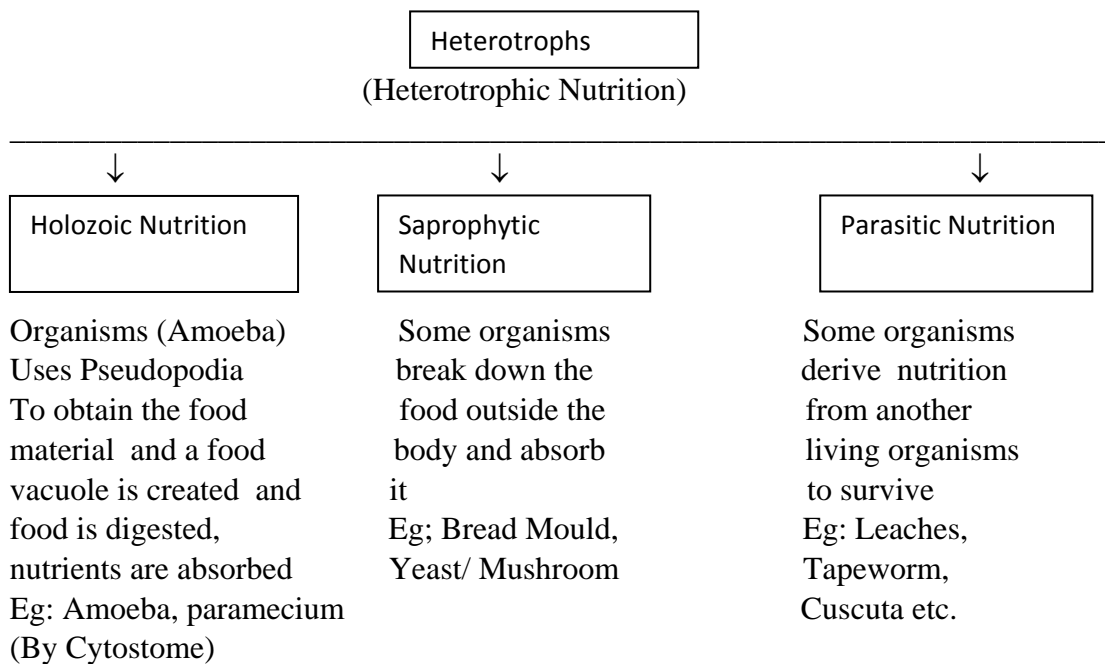
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II. Dark Reaction (biosynthetic Phase) :-



Q) What is “Heterotrophic Nutrition”

- A) It involves the intake of complex material prepared by other organisms. The form of nutrition differs depending on the type and availability of food material as well as how it is obtained by the organism.



Q) How Paramecium takes up Nutrients –

- A) Holozoic nutrition by cytostome.

Q) A person took sprouts in the morning. And had chapatti - In which part of the digestive tract do they get digested?

- A. Proteins (Sprouts) →Stomach, Small intestine
Carbohydrates (Chapatti) →Mouth, Small Intestine.

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Q) Write about Parasitic Nutrition in cuscuta.

- Dodder (Genus Cuscuta) → belongs to convolvulaceae family
- The dodder plant has no chlorophyll, The stem is of Yellow, Orange, Pink or brown in colour. leaves reduced to spine, flowers are yellow or white – bell like petals.
- Dodder plant coils around the Host plant (The Plant Which Provides Nutrients to the Parasitic Plant) and send roots like structures called '**Haustoria**' to obtain water from xylem and food from phloem.

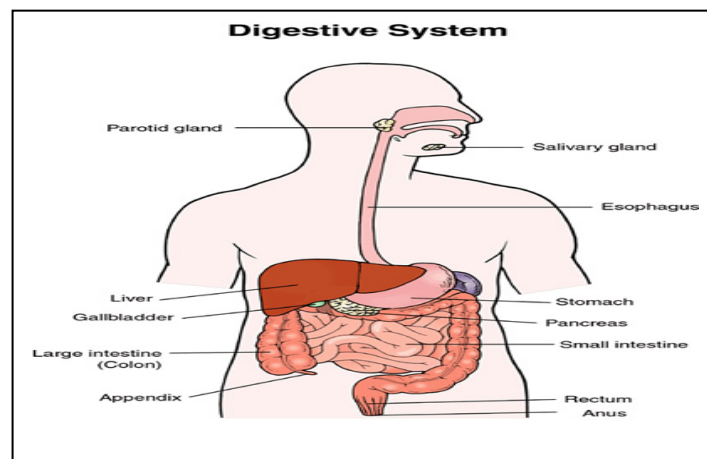
2. Give examples of some digestive enzymes.

- A. Eg : Amylase (ptyalin), Pepsin, Trypsin, Lipase, Peptidases, Sucrose's, Chymotrypsin, Nucleases, Lactose, nucleotidases and nucleasidases are the examples for digestive enzymes.

Q Name organisms having heterotrophic nutrition.

- A. Eg : Animals : Lice leeches and tapeworms.
Plants : Cuscuta ,bread moulds, yeast, mushrooms ect.

Q) Write about Nutrition in Human Beings.



The process of digestion starts in mouth and ends in anus. Alimentary canal is the long tube of 9 meters extending from mouth to anus.

Q) What is Digestion.

The process of breaking down of complex molecules into simple absorbable molecules called "**digestion**".

(I) Write about process of digestion in Mouth by Salivary glands.

Carbohydrate molecules are partially digested as 3 pairs of salivary glands present in the mouth secrete saliva.

Saliva contains salivary amylase enzyme (basic) helps in the partial breakdown of carbohydrates, mastication occurs in the mouth.

Carbohydrates $\xrightarrow[\text{(Mouth)}]{\text{Salivary Amylase / Ptyalin}}$ Dextrins and Maltose

3 Pairs of salivary glands

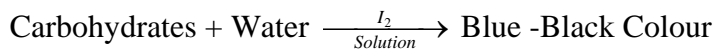
- Sides of the Jaw (Sub-maxillary)
- Below the Tongue (Sub-lingual)
- In the Palate (Parotid)

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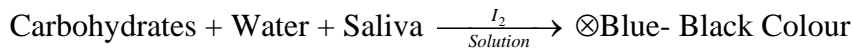
Q) Where is the process of digestion starts?

A) In mouth (Partial Digestion)

Q. Write an activity show that action of saliva on starch



(Flour)



(Flour)



Q) What is peristaltic movement? Do oesophagus secrete any enzyme?

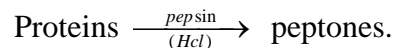
A) The contraction and relaxation of the gut muscles propels the food bolus in to the stomach, The food is not digested in the oesophagus. But food pipe secretes mucus which helps the food bolus become slippery.

(II) Write about role of Oesophagus (Food pipe)

The food bolus moves through the oesophagus through peristaltic movement.

(III) Write about process of digestion in Stomach .

Lined with Mucus, Contains 'Hcl' which activates the enzyme pepsin.



Chyme is formed in the stomach (Break down of carbohydrates and proteins). The chyme enters the small intestine through pyloric sphincter.

Q. Write about process of digestion in Small Intestine

Small intestine is longest Part – '6 Meters'.

Liver → (Bile) → It Contains 'No Enzyme'

(i) Fats Bile Juice small globules of fatty acids

This process is called '**Emulsification**'.

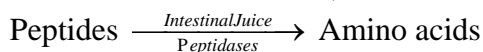
Pancreas → (Pancreatic Juice)

(i) Carbohydrates are converted to maltose by enzyme amylase

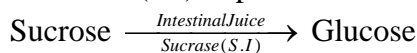
(ii) Proteins are converted to peptones by enzyme trypsin

(iii) Lipids (Fats) are converted to fatty acids of Glycerol by enzyme Lipase

(iv) Small intestine walls → (Intestinal Juice)



(S.I) Peptidases



Ville are the finger like projections which are helpful in the absorption of nutrients and they also increase the surface area for absorption.

Q. Write about role of large intestine.

A. The undigested food enters the large intestine and absorption of water takes place and the waste is eliminated in the form of faeces and process is called defecation.

Q) What is the function of Hcl in stomach and How stomach is protected

A) Hcl makes food acidic and kills germs, mucus protects the lining of the stomach from HCL and pepsin.

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Q) Which gland secretes maximum enzymes for the digestion of biomolecules .

A) Pancreas.

Q. Name the parts where carbohydrates are digested?

A) Mouth (Partially), small intestine.

Q) What is defecation

A. The defecation (Elimination of waste) occurs in the Last part of large intestine called Anus.

Q) Write flow chart of human digestive system:-

A. Food → Mouth → Buccal Cavity → Pharynx → Oesophagus →
Small Intestine ← Duodenum ← Pyloric Stomach ← Cardiac Stomach
↓
Large Intestine → Rectum → Anus.

Q) What is reverse peristalsis (Or) Health aspects of alimentary canal.

Some times the alimentary canal is effected it results in vomiting(reverse peristalsis)

Q. Define vomiting and its causes.

Vomiting is the body's method of ridding of unwanted or harmful substances from the stomach

Vomiting is caused due to

(i) Excess over eating

Consuming energy rich meals (Fats) in larger quantities for continuously.

When a person consumes indigestible (or) poisonous substances.

Q. What is greenish vomit (or) Bilious/liverish.

A. Greenish Vomiting – Bilious / liverish occurs as the bile juice cannot cope up with excess fat and results in nausea.

Indigestion can be avoided by taking certain measures.

1.Taking simple and balanced diet

2.Eating food leisurely

3.Masticating the food properly

4 Avoiding exercise immediately after meals.

5. Drinking plenty of water and having regular bowel moments.

Q) In which parts of the digestive tracts, the digestion doesn't occur.

A) Oesophagus, large intestine, Anus etc.

Indigestion is caused by stomach and duodenal ulcers.

Q. How do ulcers occur.

→ Ulcers are observed in

(1) Persons who are hurried or worried rushing from one activity to another activity without rest

2.Persons who are able to relax who are not continuously tensed up of living at slower pace.

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Q What are Vitamins into how many types they are classified.

- A. Eg : Water soluble vitamins : B Complex and vitamin C.
Fat soluble vitamins : Vitamins A : Retinol
D : Calciferol
E : Tocoferol
K : Phylloquinone

Q. What is malnutrition what are the reasons and deficiency diseases that occur due to Malnutrition.

- A. Food which lack one/ more nutrients in the required quantity leads to malnutrition
Reasons for malnutrition:-

- Poor health
- Socio economic factors
- Lack of awareness of nutritional habits
- Will full starvation.

Malnutrition is of :- Three types :-

- (i) Calorie Malnutrition
- (ii) Protein Malnutrition
- (iii) Protein – Calorie Malnutrition.

Q Name some nutritional deficiency diseases .

- A. Eg : Kwashiorkor ,Marasmus, etc.

1. Kwashiorkor diseases :- Caused , due to protein deficiency symptoms are

- (i) Accumulation of water in the intercellular spaces
- (ii) Very poor Muscles
- (iii) Fluffy face
- (iv) Diarrhoea
- (v) Dryskin
- (vi) Swollen legs

2. Marasmus :- Caused due to proteins of calorie deficiency, repeated child births.

- (i) Lean or weak, Swelling limbs.
- (ii) Less developed Muscles
- (iii) Dryskin
- (iv) Diarrhoea

Q) What questions are posed to a doctor to know about indigestion?

Q) What consequences are observed as a result of indigestion?

Q) What is the reason for indigestion?

Q) What food diet or precautions are to be taken not to suffer from indigestion. symptoms

- A) Consequences of indigestion are leading to constipation, lack of roughages
Diet containing all nutrients along with roughages is preferred for good absorption of food in villi (Selective absorption)

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Q) What is Obesity, explain its Causes and preventive measures

A) Excess intake of food (or) Over eating, leads to obesity
it is a health Hazard.

Obese people may face the following disease

1. Cardio Vascular Disease

2. Renal Problems

3. Diabetes

4. Gall bladder problems.

Preventive measures:- regular exercise, intake of moderate diet

Q. What are the common symptoms observed in kwashiorkor to marasmus?

A. Dryskin, Diarrhoea, Poor Muscle development

Q. What are vitamins

Vitamins are organic substance, required in small quantities, these are obtained from diet and bacteria

Vitamins are of 2 types (i) water soluble vitamins Eg

Vit 'B' & 'C' (ii) Fat Soluble Vitamins Eg Vit – A, D, E, K.

Vitamin	Resources	Deficiency	Symptoms
1. Thiamine (B ₁) 2. Riboflavin (B ₂)	Cereals, Oilseeds, Vegetables milk, Meat, Fish, eggs Milk, egg, Liver, Kidney. Green Leafy vegetables.	Diseases Beri- beri Glossitis	Vomitings, Fits, Loss of Appetite difficulty in breathing Mouth Crack at Corners, Photophobia, Red And sore tongue Scaly skin.
3. Niacin (B ₃)	Kidney, Liver, Meat, Egg Fish, out Seeds.	Pellagra	Dermatitis, diarrhoea, Loss of Memory, Scaly, skin.
4. Pyridoxine (B ₆)	Cereals, oilseeds, Vegetables, Milk, Meat, Fish, eggs, Liver.	Anaemia	Hyper irritability. Nausea Vomitings, Fits.
5. Cyanocobalamin (B ₁₂)	Synthesised by bacteria Present in intestine.	Pernicious Anaemia	Lean and weak, Less appetite.
6. Folic Acid	Liver meat, eggs, Milk, Fruits Cereals Leafy Vegetables	Anaemia	Diarrhea, Loss of leucocytes, intestinal Mucus Problems.

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7. Pantothenic Acid	Sweet potatoes, groundnuts, Vegetables, Liver, kidney, egg.	Burning Feet	Walking Problems, Sprain
8. Biotin	Fishes, Nuts, Vegetables, Liver, milk, kidney.	Nerves disorder	Fatigue, mental depression, muscle Pains.
9. Ascorbic Acid	Green Lealy vegetables. Citrus fruits, sprouts	Scurvy, I, Eye, Skin diseases	Delay in healing of Wounds fracture of Bines.
10. Retinol (A)	Leafy veg, carrot, Tomats pumpkin, Papaya, mango, mead Fish, egg Liver, milk, cod Liver oil, shark Liver oil.	Eye, Skin diseases	Xerophthalmia, cornea Failur
11. Calciferol (D)	Liver, egg, butter, Cod Liver oil, shark Liver oil (Morning sun rays)	Rickets	Improper formation of bones, Knockness, swollen Wrists delayed dentition , weak bonesl.
12. Tocoferol (E)	Fruits, vegetables, sprouts Meat, Egg sun flowers	Fertility disorders	Sterility in males, abortion in females.
13. Phylloquinone (K)	Green leaf vegetables Milk	Blood clotting	Delay in blood clotting, over Bleeding.

Q. Deficiency of which vitamin causes Anaemia.

A. Anaemia is caused due to – Vitamin B₆ (Pyridoxine) or Folic Acid.

Q. Deficiency of which vitamin causes Pellagra.

Pellagra (Scaly skin) is caused due to deficiency of – Riboflavin (B₂), Niacin (B₃), Retinol (A),

Where do protein digestion start?

Starts in stomach due to the enzyme pepsin.

A person is suffering from dermatitis, diarrhoea, loss of memory

Doctor advised him to take (B₃^(Niacin)) vitamin foods more.

Raju ate a food ‘X’ which contains a substance ‘P’, ‘Q’ of ‘R’ ‘Q’ gets broken down by the action of enzyme ‘K’ secreted by the salivary glands, ‘P’ gets broken down by the action of liver, of ‘R’ gets broken down in the stomach

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Identify 'P' , 'Q' of 'R' of 'K' 'P' → Lipid ; Q→Carbohydrate, R→Protein

K→Salivary amylase.

A person ate food hurriedly without chewing . A region got blocked in the digestive tract what is it?

Oesophagus.

A Student identified a leaf less plant which coiled around another plant.

- a) What kind of nutrition the plant undergo –
- A) Parasitic.
- b) How do this leaf less plant obtains nutrition' –
- A) Haustoria.
- c) After removing the roots also this plant survived How; because of Haustoria as it absorbs nutrients from the Host plant.
- d) Give an example of parasitic plant Eg :-
cuscuta.

A Student has lean and weak swelling limbs, less muscles development. And dry skin.

- a)The student should visit a specialist doctor:- Nutritionist.
- b)After observing, doctor confirms that student is suffering from a disease called marasmus. Intake of food rich with proteins and calories.

4. Why do you think that carbohydrates are not digested in the stomach?

- A. 1) For the digestion of carbohydrates ,enzyme ptyalin or amylase are required.
2) The gastric juice produced by stomach do not contain the enzyme ptyalin or amylase. It contains only pepsin which digests proteins.

5 Hence carbohydrates are not digested in the stomach.

A Carbohydrates are digested partially in the mouth and completely in small intestine.

6 What food habits you are going to follow after reading this chapter ? Why ?

- A. The food habits I am going to follow after reading this chapter are :
- 1) I take balanced diet which contains proper amounts of carbohydrates, proteins, fats, vitamins and minerals.
 - 2) I avoid taking food containing high proportion of fat.
 - 3) I eat food as much required by my body. I do not over eat .
 - 4) I will not eat rich meals over several days.
 - 5) I eat simple balanced meals, eat it leisurely and thoroughly masticating the food.
 - 6) I avoid doing violent exercise soon after eating food.
 - 7) I empty the bowels regularly avoiding constipation.
 - 8) I will see to have plenty of roughages in the diet.

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I. Choose the correct answers:

1. Which of the following organisms take the food by parasitic nutrition? []
A) Yeast B) Mushrooms C) Cuscuta D) Leeches
2. The rate of photosynthesis is not affected by []
A) Light intensity B) Humidity C) Temperature D) Carbon dioxide concentration.
3. 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
4. The digestive juice without enzyme is []
A) Bile B) Gastric juice` C) Pancreatic juice D) Saliva
5. In single celled animals, the food is taken by? []
A) The entire body surface B) Mouth C) Teeth D) Vacuoles
6. Which part of the plant takes in carbon dioxide from the air for photosynthesis?
A) Root hair B) Stomata C) Leaf veins D) Sepals
7. An equation for photosynthesis was formulated and proposed by []
A) Priestley B) C.B.Van Neil C) Pasteur D) None
8. Iodine can be used to test the presence of []
A) Glucose B) light C) Starch D) carbon dioxide
9. This gas is released during photosynthesis. []
A) Oxygen B) Carbon dioxide C) Light D) Energy
10. Photosynthesis occurs in this part of the cell []
A) Chloroplast B) Mitochondria C) Cytoplasm D) Nucleus
11. These are the sites for trapping solar energy in the chloroplast. []
A) Stroma B) Grana C) Membrane D) None
12. Finger-like extensions of amoeba are called []
A) Cilia B) Flagella C) Pseudopodia D) Tentacles
13. Digestive glands present in mouth are []
A) Salivary B) Gastric C) Intestinal D) All
14. Examples of parasitic organisms are []
A) Cuscuta B) Lice C) Leech D) All the above

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15. The enzyme present in saliva is []
A) Pepsin B) Lipase C) Amylase D) Tripsin
16. Cane sugar is []
A) Lipase B) Sucrose C) Amylase D) None
17. These are organic substances []
A) Water B) Fats C) Vitamins D) Minerals
18. The disease caused by protein deficiency is []
A) Kwashiorkor B) Marasmus C) Obesity D) All
19. This disease is a big health hazard []
A) Kwashiorkor B) Marasmus C) Obesity D) None
20. Deficiency of Thiamine leads to a disease called []
A) Pellagra B) Beri-beri C) Glossitis D) Scurvy
21. This vitamin is synthesized by bacteria present in the intestine []
A) Cyanocobalamine B) Niacin C) Folic acid D) Biotin

II. Fill in the blanks:

- The food synthesized by the plant is stored as _____
- _____ are the sites of photosynthesis.
- Pancreatic juice contains enzymes for carrying the process of digestion of _____ and _____
- The finger-like projection which increase the surface area in small intestine are called _____
- The gastric juice contains _____ acid.
- _____ vitamin is synthesized by bacteria present in intestine.
- The energy present in the light rays is called _____
- _____ regulates the exchange of gases.
- Grana are stacks of _____ membranes.
- _____ are the organisms capable of synthesizing food materials.
- The process of _____ makes plants the universal food providers.
- The light reaction of photosynthesis takes place _____ of chloroplast.
- ATP and NADPH are called _____ powers.
- Finally glucose is converted to _____
- Dark reactions occur in _____
- In paramecium, food is taken in , at a specific spot called _____

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17. Cuscuta reflexa (dodder), absorbs food through _____
18. The process of taking food in the body is called _____
19. The process of converting fats into small globule like forms by bile juice is called _____
20. Vitamin B-complex and vitamin C are called _____ vitamins.
21. _____ can be avoided by having plenty of roughage in the diet.
22. Eating of food that does not have one or more than one nutrients in required amount is known as _____
23. Chemical name of vitamin D is _____
24. _____ are micronutrients required in small quantities.
25. The food that is digested in the stomach is _____
26. The movement of food in the oesophagus is _____ movement

III. Match the following

- | | | | |
|-----|------------------------|--------|--------------------|
| i) | Group-A | | Group-B |
| | 1. Niacin | [] | A) B ₁ |
| | 2. Folic acid | [] | B) B ₂ |
| | 3. Calciferol | [] | C) Vitamin-C |
| | 4. Tocoferol | [] | D) Vitamin-D |
| | 5. Thiamine | [] | E) B ₃ |
| | 6. Riboflavin | [] | F) Anaemia |
| | | [] | G) Vitamin-E |
| | | | H) Glossitis |
| ii) | Group-A | | Group-B |
| | 1. Beri-Beri | [] | A) Folic acid |
| | 2. Pellegra | [] | B) Cyanocobalamine |
| | 3. Vomiting and Nausia | [] | C) Calciferol |
| | 4. Pernicious Anaemia | [] | D) Thiamine |
| | 5. Xerophthalmia | [] | E) Vitamin-A |
| | 6. Rickets | [] | F) Pyridoxine |
| | | | G) Niacin |

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1.AUTOROPHIC NUTRITION

I

1) C	2) B	3) B	4) A	5) A	6) B	7) B
8) C	9)A	10) A	11) B	12) C	13) A	14) D
15) C	16) B	17) C	18) A	19)C	20) B	21) A

II

- | | | |
|--------------------|--------------------|-------------------|
| 1) carbohydrates | 2) Chloroplasts | 3) proteins, fats |
| 4) Villi | 5) HCl | 6) Cyanocobalamin |
| 7) quantum | 8) Stomata | 9) thylakoid |
| 10) Autotrophs | 11) photosynthesis | 12) Grana |
| 13) assimilatory | 14) starch | 15) stroma |
| 16) cytostome | 17) haustoria | 18) ingestion |
| 19) emulsification | 20) water soluble | 21) Constipation |
| 22) malnutrition | 23) calciferol | 24) Vitamins |
| 25) chyme | 26) peristaltic. | |

- III. i) 1) E 2) F 3) D 4) G 5) A 6) H
- ii) 1) D 2) G 3) F 4) B 5) E 6) C