NUTRITION

1.1 NUTRITION :

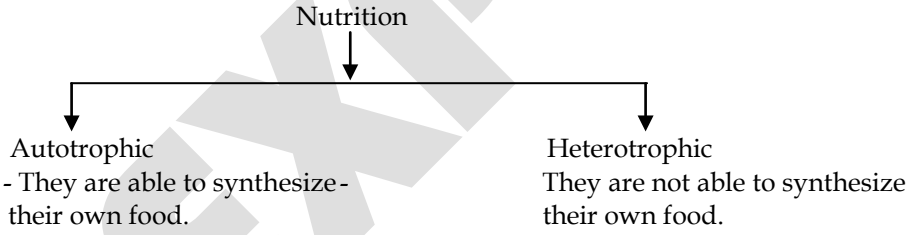
"Nutrition" is a process of intake as well as utilization of nutrients by an organism. It is the process of breakdown of nutrients into smaller molecules and their absorption. Food provides us nutrition and energy. It contains different types of nutrients in varying amounts according to the need of our body.

1.1 (a) Nutrients :

These are the substances required by our body for its growth, repair, work and maintenance of the body. Different types of nutrients are carbohydrates, fats, proteins, vitamins, mineral etc. Our daily energy need may vary according to our occupation, age, sex and under some specific conditions.

1.2 MODES OR NUTRITION :

There are several modes of nutrition on the basis of which organisms are classified as follows :



1.2 (a) Autotrophic :

(Auto = self, trophic = food) It is a mode of nutrition in which organisms prepare their own food. Inorganic molecules like CO_2 and H_2O are converted into organic molecules like carbohydrates in the presence of sunlight and chlorophyll. **e.g. Green plants.** Autotrophs are further categorized. as :

(i) Photoautotroph : Those which utilize sunlight for preparing their food

(ii) Chemoautotroph : Those which utilize chemical energy for preparing their food.

1.2 (b) Heterotrophic :

(Hetero = different ; trophic = food) It is a mode of nutrition in which organisms derive their food fro some other animals or plants. They cannot prepare their own food **e.g. human being**. Heterotrophs are further categorized depending on the nature of food they consume :

(i) Herbivores : Animals which eat only plants, **e.g. Cow, goat** etc.

(ii) Carnivores : They feed on flesh of other animals, **e.g. Lion, vulture** etc.

(iii) Omnivores : T hey feed on plants and animals both **e.g. Dog, human** etc.

(iv) Detritivores : Feed on detritus or dead organic remains, **e.g. Earthworm** etc.

(v) Sanguivorous : Feed on blood **e.g. Leech, female mosquito** etc.

(vi) Frugivorous : Feed on fruits, **e.g. Parrot** etc.

(vii) Insectivores : Feed on insects, **e.g. Bats** etc.

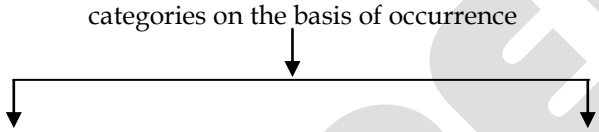
1.2 (c) On the Basis of Mode of Feeding Organisms are Categorised As :

(i) Holozoic : They ingest mostly solid but sometimes liquid food. **e.g., Amoeba, human** etc.

(ii) Saprotrophic : they absorb organic matter from dead and decaying organisms with the help of their enzymes. **e.g., Bacteria, fungi** etc.

(iii) Parasitic : They derive their nutrition from other living plants or animals e.g. **Plasmodium round worms** etc.

Nutrition can be divided into two categories on the basis of occurrence



Nutrition in plants | Nutrition in animals

1.3 Nutrition in Plants:

- Plants are autotrophic in nature. They prepare their own food hence they are called as **producers.**
- They contain a green pigment called chlorophyll which can entrap solar energy which is then converted into chemical energy in the form of food and the process is called as **"Photosynthesis".**

1.3 (a) Photosynthesis :

(i) Definition : The synthesis of organic compounds like glucose from simple inorganic molecules like CO_2 and H_2O by the cells of green plants having chlorophyll in the presence of sunlight is called as photosynthesis.

(ii) Equitation of photosynthesis : Photosynthesis is a two step process.

$$6CO_2 + 12H_2O \xrightarrow[\text{Chlorophyll}]{\text{Sunlight}} C_6H_{12}O_6 + 6O_2 + 6H_2O$$

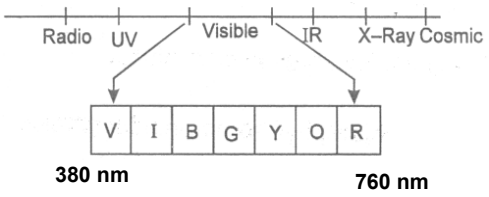
(A) Light reaction : AT, $NADPH_2$ and O_2 are produced.

(B) Dark reaction : CO_2 & H_2O are converted into glucose.

• Photosynthesis essentially requires two things :

1.3 (b) Sunlight :

- For plants sun the basis source of radiant energy.
- Plants utilize the light in the visible region of solar spectra (electromagnetic spectrum) which comes under the range of 390 nm - 780 nm.
- Visible region consists of white light which is a mixture of 7 lights of different wavelengths.



- Maximum photosynthesis occurs in red region.
- There is minimum photosynthesis in green region because green parts of plants reflect whole of the green light.

1.3 (c) Chlorophyll :

These are the green pigments present in chloroplast. They are found in green leaves in a maximum amount as well as in other green aerial parts of plant. There are six different types of chlorophyll, they are chlorophyll a,b,c,d,e and bacteriochlorophyll, amongst them chlorophyll a and chlorophyll b are the most commonly occurring chlorophylls.

• Besides chlorophyll certain other pigments are also present in plants like.

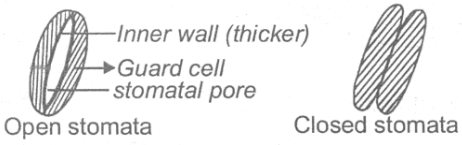
(i) Carotenes : Orange in colour **e.g. Carrot.**

(ii) Xanthophylls : Orange yellow in colour **e.g. Maize.**

(iii) Phycobilins : Different colour like red, violet **e.g. Blue-green algae, brown algae** etc.

1.3(d) Raw Materials of Photosynthesis :

(i) Carbondioxide : Terrestrial plants obtain carbon dioxide from the atmosphere through the small openings present on leaves called as stomata. **'Stomata'** are the small pores present on the surface of leaves. They help in exchange of gases and water. Stomata opening is guarded by the presence of guard cells (kidney shaped). Aquatic plants obtain CO_2 dissolved in water through their general body surface so they perform more photosynthesis than terrestrial plants.



(ii) Water : Plants absorb water from the soil by the process of osmosis. This water is transported to leaves by a special type of tissue called as **xylem.**

• Plants utilize carbon dioxide during photosynthesis, the intensity of light at which amount of CO_2 used during photosynthesis becomes equal to the amount of CO_2 released during respiration by plants in called as **Compensation point.**

• Compensation point occurs at low light intensity that is during morning and during evening hours.

1.3 (e) Site Photosynthesis :

Site of photosynthesis is different in prokaryotes and eukaryotes.

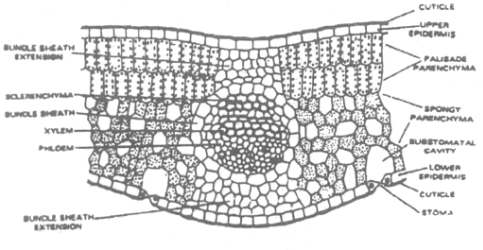
- **In prokaryotes :** Photosynthesis occurs in lamellar chromatophores.
- **In eukaryotes :** Photosynthesis occurs in chloroplast.
- **Exception : Fungi** (It lacks chlorophyll so no photosynthesis occurs here).
- In higher plants chloroplast in the main site of photosynthesis.
- Chloroplast is also called as green **plastid.**
- Plastid was first observed by **Haeckel.**
- Plastids are of 3 different types on the basis of pigments present in them.

(i) Leucoplast : White in colour, found in underground parts, lacks and coloured pigment. Helps in storage of protein (Aleuroplst), oil (Elaioplast), starch (Amyloplst)

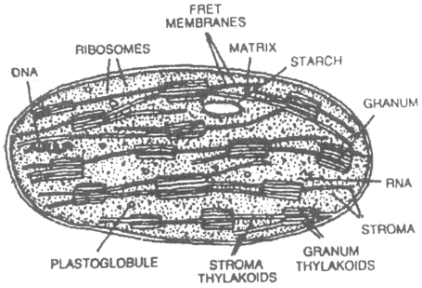
(ii) Chloroplast : Colour other than green found in aerial parts on the plants

(iii) Chloroplast : Contain green pigment, called as chlorophyll.

- Chloroplast was discovered by **Schimper.**
- Number of chloroplasts is variable in different species of plants.
- In lower plants like algae they are 1 or 2 number.
- In higher plants their number varies from 40 -100 per palisade cell or more.
- Chloroplast also have variable shapes, for example cup shaped, ribbon shaped etc. in algae while it is discoidal in higher plants.



T.S. of leaf



Chloroplast

- A typical structure of chloroplast is a double membranous structure having two parts.

(i) Grana : It is a lamellar system consisting of stacks of granum lamella each bounded by a membranous box called as **thylakoid.** They are 40 - 60 per cell. Number of thylakoids per grana is 50 or more Chlorophyll molecules are found inside the thylakoid membrane where they trap solar energy in the form of small energy packets called **'photon'** or **'quanta'**. Grana are interconnected to each other by a channel called as **stroma lamellae** or **Fret's channel.**

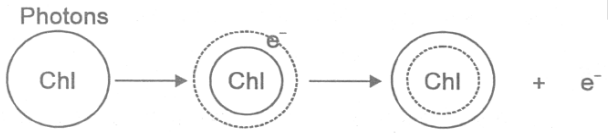
(ii) Stroma : It is a non pigmented proteinaceous matrix in which grana remain embedded. It contain enzymes for dark reaction.

1.3 (f) Mechanism of Photosynthesis :

(i) Light reaction :

- It is also called as photochemical process.
- It was discovered by → **'Robert Hill'** therefore it is also called as **Hill's reaction/**
- **Site :** Grana of chloroplast.
- **Raw materials :** Light and water.
- **Regulation :** This process is regulated by chlorophyll molecules.
- **It consist of 3 steps :**

(A) Photo excitation of chlorophyll molecule : During this process chlorophyll molecule receives sunlight in the form of small energy bundles called as **photons** and become excited to higher energy level.



(B) Photolysis : It is also called as photoxidation of water, this takes place in presence of Mn^{+2} and Cl^- ions.

$$2H_2O \longrightarrow 4H^+ + O_2 + 4e^-$$

O_2 is liberated as by product and H^+ ions are used for reduction of NADP

$$2NADP + 4H^+ \longrightarrow 2NADPH_2$$

(C) Photophosphorylation : During this process ATP are produced. It takes place in **quantasomes.**

Mg^{+2} ions and inorganic phosphate is required to convert ADP $\longrightarrow$ ATP, ADP + iP $\longrightarrow$ ATP.

(ii) Dark reaction :

- It is also called as **thermo chemical reaction.**
- It was discovered by **Melvin calving and benson** therefore it is also called as **Calving cycle** Site = Stroma of chloroplast.
- **Raw materials :** They require CO_2, $NADPH_2$, ATP and Enzymes.
- **Regulated by :** Light reaction and enzymes.
- **It involves three basic steps :**

(A) Carboxylation : In this step CO_2 is captured by CO_2 acceptors like RUBP (C3 Plants) PET (C4Plants) with the help of **carboxylase enzyme** i.e. RUBISCO & PEPCO respectively.

(B) Synthesis : This phase cap true CO_2 is assimilated into glucose in the presence of phosphatase and isomerease enzymes and RUBP is regenerated back.

(C) Regeneration of RUBP

1.4 FACTORS AFFECTING PHOTOSYNTHESIS :

1.4 (a) Light ;

Normally plants utilize sunlight but marine algae can perform photosynthesis even in the moon light. Plants can also perform photosynthesis in the artificial lights.

- Highest rate of photosynthesis : Red light
- Minimum photosynthesis : Green light
- Very high light intensity can cause reduction in the rate of photosynthesis by causing

(i) Decrease in transpiration rate

(ii) Denaturation of chlorophyll molecule

1.4 (b) Temperature :

Optimum range = 25^0 C to 30^0 C

It ranges from 10^0 - 40^0 C

In some forms like algae of hot spring $\rightarrow$ 60^0 - 70^0 is normal

1.4 (c) Carbon dioxide :

It is the first limiting factor 0.03 - 0.1% is present in the atmosphere concentration of CO_2 $\propto$ rate of photosynthesis.

above 0.9% $\propto \frac{1}{\text{Rate}}$

between 0.1 to 0.9%, it is constant and it is called as saturation point.

1.4 (d) Oxygen :

O_2 acts as competitive inhibitor of CO2. Over concentration of O_2 stops photosynthesis.

1.4 (e) Chlorophyll :

Chlorophyll content is directly proportional to rate of photosynthesis. No photosynthesis occurs in etiolated cells, In variegated leaves it occurs only at places where chlorophyll is present.

1.5 SIGNIFICANCE OF PHOTOSYNTHESIS :

Photosynthesis is a boon to the nature and to the human beings. It has following significance :

(i) Production of food material

(ii) Atmospheric control and purification of air.

DAILY PRACTIVE PROBMES # 1

OBJECTIVE QUESTION

1. The raw materials for photosynthesis are

(A) CO_2 & $O_2$1 (B) sunlight and CO_2 (C) water and chlorophyll (D) CO_2 and water.

2. Most of the photosynthesis (80%) which takes place on this earth is carried out by

(A) green plants on land (B) algae present in fresh water

(C) algae found in ocean (D) algae present in ocean and fresh water sources.

3. Which of the following ahs no digestive enzyme ?

(A) Saliva (B) Bile (C) Gastric juice (D) Intestinal juice

4. Plants are green in colour because

(A) they absorb green light only (B) they reflect green light

(C) they absorb green light but reflect all other lights (D) none of the above are correct.

5. Full name of N ADP is

(A) Nicotinamide dinucleotide phosphate (B) Nicotine adenine dinuceotide phosphate

(C) Nicotinamide adenine dinucleotide phosphate (D) None of the above

6. Wavelength of visible light is

(A) 200 - 400 nm (B) 400 - 700 nm (C) 700 - 900 nm (D) 100 - 200 nm

7. The presence of sugar in onion leaves can be tested with

(A) iodine (B) copper sulphate solution

(C) lime water (D) benedict's solution

8. Chemical reaction takes place during dark reaction of photosynthesis is

(A) photolysis (B) hydrolysis

(C) carbon dioxide is bonded with RUBP (D) nitrogen fixation

9. Dark reaction and light reaction of photosynthesis takes place in

(A) stroma and grana of chloroplast respectively (B) grana and stroma of chloroplast respectively

(C) grana only (D) stroma only

10. CO_2 acceptor during dark reaction of photosynthesis is

(A) RUBP (B) PEP (C) NADPH (D) ATP

SUBJECTIVE QUESTIONS

VERY SHORT ANSWER TYPE QUESTIONS

1. Define photosynthesis ?

2. Name the different modes of nutrition and classify them with one example of each ?

3. Name the site of light and dark reaction of photosynthesis ?

LONG ANSWER TYPE QUESTIONS

4. Explain how water and temperature influence the rate of photosynthesis ?

5. Describe the structure and role of chloroplast along with a well labelled diagram ?

6. Describe the mechanism of photosynthesis ?

7. Explain the process of 'Photosynthesis' in plants. List four factor which influence this process and describe how each of them affects the rate of the photosynthesis.

8. Explain the following aspects of photosynthesis in plants :

(i) The role of chlorophyll

(ii) Dark reaction

(iii) Calvin - Benson Cycle.

NUTRITION

2.1 NUTRITION IN ANIMALS :

- Animals have highly evolved digestive mechanism that includes two basic components :
- **Alimentary canal :** Long, hollow, tubular structure consisting of various organs for digestion.
- **Digestive glands :** They secrete enzymes/hormones which help in digestion.
- **Digestion in animals consist of following steps :**
- **Ingestion** : The process of intake of food.
- **Digestion** : It is the breakdown of large and complex molecules into simpler, smaller and soluble forms.
- **Absorption** : Taking up of the digested food through intestinal wall to blood.
- **Assimilation** : In this process absorbed food in taken by body cells.
- **Egestion** : The process by which undigested matter is expelled out.
- Digestive system is regulated by various hormones secreted by some endocrine glands.
- Alimentary canal was first of all developed in the phylum Platyelminthes but only mouth was present in them.
- Coiled and well developed alimentary canal was developed in annelida till mammals.

2.2 NUTRITION IN LOWER ANIMALS :

2.2 (a) Nutrition in Amoeba :

It is a unicellular organism living in water.

- Mode of nutrition of **holozoic.**
- The process of obtaining food is the **phagocytosis** (cell eating)
- Steps involved in digestion of amoeba are :

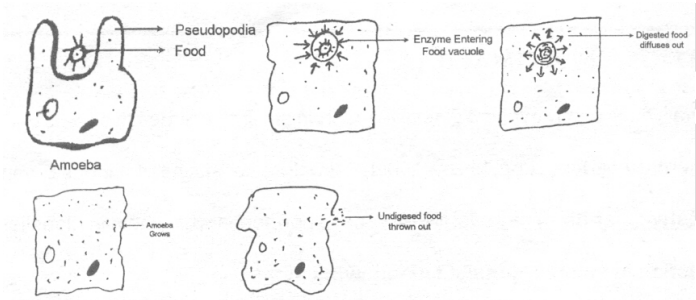
(i) Ingestion : Since it is unicellular so a single cell is responsible for carrying out all the vital activities. Food is ingested with the help of **pseudopodia.** Animal engulfs the food particle lying near it by forming pseudopodia around it and forming a **food vacuole** while is considered at its **temporary stomach.**

(ii) Digestion : The enzymes from surrounding cytoplasm enter the food vacuole and break down the food into smaller & soluble forms.

(iii) Absorption : The digested food is now absorbed by cytoplasm by simple diffusion and then the food vacuole disappear.

(iv) Assimilation : The food absorbed in amoeba is used to obtain energy from respiration, for its growth and reproduction.

(v) Egestion : Undigested food is thrown out of the cell.



2.2 (b) Nutrition is Grasshopper :

• It has a well developed digestive system having an alimentary canal and digestive glands.

• The various organs of digestive system of grasshopper are

Mouth → Oesophagus → Crop → Gizzard → Stomach → Ileum → Colon → Rectum.

• **Glands associated with it are :**

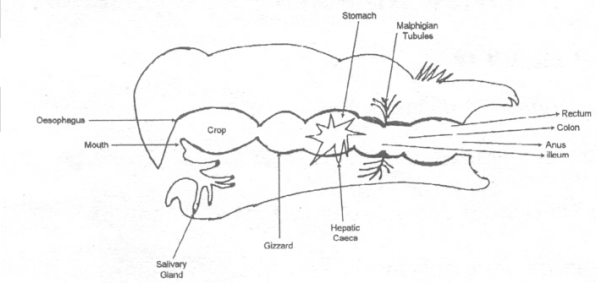
(i) Salivary glands **(ii) Hepatic caeca**

• Digestive system of a grasshopper can be divided into three parts.

(i) Foregut : mouth to gizzard

(ii) Midgut : gizzard to ileum (actual stomach)

(iii) Hindgut : stomach to anus.



• **The process involves:**

(i) Ingestion : If feeds on green leaves so it takes food through its mouth with the help of it's forelegs and mouth parts.

(ii) Digestion:

(A) It starts from the mouth.

(B) A pair of salivary glands secretes saliva and release it into the mouth through the salivary duct.

(C) Saliva mixed with food and lubricates and soften the food.

(D) Digestion of starch begins here.

(E) This slightly digested food enters into the crop through a food pipe i.e. esophagus.

(F) Crop stores the food temporarily.

(G) Now the food moves to gizzard. Here it is finally crushed and masticated an then moves to stomach.

(H) In stomach hepatic caeca release its secretions in the form of digestive enzymes, thus the food is then completely digested at this site.

(iii) Absorption : The digested food moves to small intestine (ileum) and absorbed through its walls.

(iv) Assimilation : Nutrients are assimilated whenever required by the cells for the fulfillment of the growth, energy and repair of the body.

(v) Egestion : Undigested food is then passed through hindgut (where H_2O absorbed) and expelled out through anus in the form of elongated dry faecal pallets.

• The excretory organ of the grasshopper is malphigian tubules present at the junction of hindgut and midgut.

2.3 NUTRITION IN HUMANS :

• Humans have highly evolved and complicated digestive system consisting of an alimentary canal and different types of digestive glands.

• Alimentary canal consist of following organs :

2.3 (a) Mouth :

It is small slit through which food is ingested.

2.3 (b) Buccal Cavity :

Mouth opens into a chamber called as **buccal cavity.** Roof of buccal cavity is called hard palate. At the floor of this cavity thick muscular structure is present called tongue. it helps in chewing swallowing, testing and speaking. Tongue has various types of papilla having **taste buds.**

• Jaws present in buccal cavity are provided with four different types of teeth :

(i) Incisors	:	For cutting
(ii) Canines	:	For tearing
(iii) Premolars	:	For grinding
(iv) Molars	:	For grinding

• **Dental formula of humans :**

(A) Milk teeth → These are temporary, arise at 6 - 11 month age, 20 in number

$$\frac{\text{Half upper jaw}}{\text{Hlaf lower jaw}} = \frac{2102}{2102}$$

(B) Permanent teeth $\rightarrow$ arise at 6 – 12 years, 32 in number

$$\frac{\text{Half upper jaw}}{\text{Half lower jaw}} = \frac{2123}{2123}$$

• Three pairs of salivary glands are found in mouth which release their secretions into the buccal cavity.

2.3 (C) Oesophagus :

Also called as food pipe. It leads the food from mouth to stomach, Oesophagus has highly muscular walls, no digestion occurs here.

2.3 (b) Stomach :

It is a 'J' shaped bag present on left side of abdomen. It contains several branched and butular glands present on the inner surface of its wall, which secret gastric juice.

23 (e) Small Intestine :

It is a coiled and narrow tube having 3 regions : Duodenum , jejunum, ileum.

• On the inner wall of small intestine numerous finger like projections are found which are called as **villi,** they increase the surface area of absorption.

• Duodenum is proximal part of small intestine receives secretion from liver and pancreas.

2.3 (f) large Intestine :

Small intestine opens into large intestine from w here the undigested food material is passed to anus through rectum. It is divided into three parts:

(i) Caecum (ii) Colon (iii) Rectum

2.3 (g) Digestive Glands :

(i) Salivary glands : 3 pairs of salivary glands are found in mouth cavity. It helps in chemical digestion. They secret at enzyme called **salivary amylase** or **ptyalin.** It helps in digestion of starch.

(ii) Gastric glands : Present in stomach. They secret hydrochloric acid, protein digesting enzymes and mucus.

(iii) Liver : It is the largest gland, secrets bile into the small intestine. Bile contains bile juice and bile pigments. Bile is alkaline in nature and it is temporarily stored in gall bladder and helps in digestion of fats, it also helps in absorption fats.

(iv) Pancreas: It lies parallel to and below the stomach. It secrets pancreatic juice into small intestine. Pancreatic juice contains tyrosine and pancreatic amylase. Besides these 2 enzymes pancreas secretes 2 hormones also i.e. :- insulin and glucagons so it has both exocrine as well as endocrine functions. Both bile and pancreatic juice are released into the duodenum by a common duct.

DAILY PRACTICE PROBLESMS # 2

OBJECTIVE QUSTIONS

1. Compensation point refers to the intensity of light at which
(A) Rate of respiration = rate of photosynthesis (B) Rate of respiration > rate of photosynthesis
(C) Rate of respiration < Rate of photosynthesis (D) None of the above is correct

2. Among the following which is a parasitic plant ?
(A) Plasmodium (B) Cuscuta (C) Amoeba (D) Rhizobium

3. The nutrition in mucor is
(A) parasitic (B) autotrophic (C) saprophytic (D) holozoic

4. In amoeba the digestion is intracellular because
(A) amoeba is unicellular (B) amoeba is multicellular
(C) amoeba is found is pond (D) amoeba is microscopic animal

5. Digestion of food in human starts from
(A) duodenum (B) small intestine (C) mouth (D) large intestine

6. The digestion of food is completed in the
(A) ileum (B) duodenum (C) stomach (D) large intestine

7. The most important function of villi in the small intestine is
(A) to provide strength to the intestine
(B) to provide space for capillaries and lacteals
(C) to provide increased surface area for absorption of digested food
(D) to provide habitat for bacteria

8. Which of the following sections does not contain enzymes ?
(A) Bile (B) Pancreatic juice (C) Intestinal juice (D) Saliva

9. Chewing is an example of
(A) chemical digestion (B) mechanical digestion (C) involuntary action (D) hydrolysis

10. The final product of digestion of carbohydrates and proteins are
(A) glycerol and amino acid respectively (B) glucose and amino acids respectively
(C) amino acids and glycerol respectively (D) amino acids and glucose respectively

SUBEJCTIVE QUESTIONS

VERY SHORT ANSWER TYPE QUESTIONS

1. Name the different steps involved in digestive process.

2. Name the excretory organ of grasshopper.

3. Give the importance of bile during digestion process, also write from where it is secreted, what is its site of action ?

LONG ANSWER TYPE QUESTIONS

4. Draw a well labelled diagram of human alimentary canal. Mention the functions of liver in digestion.

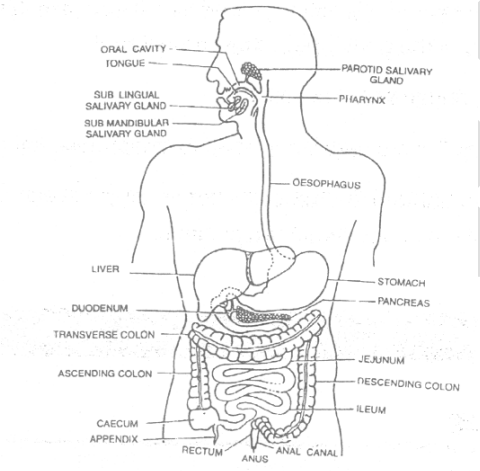
5. Describe the digestive system of grasshopper with the help of a well labelled diagram ?

6. Explain how does the major nutrients in chapatti eaten by you in your food get digested and finally absorbed by the alimentary canal ?

NUTRITION

3.1 INTESTINAL GLANDS :

They secrete intestinal juice and mucus.



3.1 (a) Digestive System :

This system involves following processes :

(i) Ingestion : Intake of food is done through mouth, food is then chewed and masticated and sent to esophagus through pharynx by swallowing.

(ii) Digestion : Saliva secreted in buccal cavity starts digestion of starch into maltose. This partly digested food is then passed to stomach by esophagus through peristaltic movement. Food is churned in stomach for about three hours and broken down into smaller pieces. Due to presence of hydrochloric acid, medium of stomach becomes acidic. In acidic medium protein digestive enzyme pepsin breaks down proteins into peptones. Gastric Lipase is also secreted here which partially breaks down lipids.

- Secretion of gastric juice is stimulated by the sight, smell or thought of food.
- Now the partly digested food moves to small intestine i.e. in the duodenum. Duodenum receives the secretion from liver and pancreas through a common duct they are bile and pancreatic juice, and alkaline in nature. So the digestion and emulsification of facts occurs at this place.
- Here in the duodenum fats are emulsified by bile, remaining proteins are digested by trypsin and

starch by pancreatic amylase.

NOTE : Duodenal wall secretes bicarbonate ions which make the medium alkaline.

• This partially digested food now enters in the ileum where intestinal juice i.e. **"Succus entericus"** is secreted. At this place digestion is completed.

Carbohydrates ⟶ Glucose

Proteins ⟶ Amino acids

Fats ⟶ Fatty acids and glycerol

(iii) Absorption : After digestion molecules are broken down into simpler water soluble forms now they are to be utilized, so they pass through the wall of small intestine which contains blood capillaries and enters into the blood. For absorption of fat lymph capillaries are present called as lacteals.

NOTE : Wall of small intestine have tiny finger like projections called **villi,** they increase the surface area for absorption.

(iv) Assimilation : The process of utilizations of food is called assimilating. The nutrients dissolved in blood are carried to all parts of the body where they are utilized.

(A) For building up and replacement of cells.

(B) For obtaining energy. This energy is released by the process of oxidation during respiration.

(v) Egestion : The undigested food is then collected in large intestine where water is absorbed and remaining waste is expelled out or egested through anus.

DAILY PRACTICE PROBLEMS # 3

OBJECTIVE QUESTIONS

1. In amoeba the digestion of food is

(A) extracellular (B) intracellular (C) intercellular (D) none of the above

2. Through mastication of food is essential because

(A) mastication of food makes the teeth stronger

(B) it makes the process of swallowing the food easier

(C) by this process bigger pieces of food are broken down into smaller pieces.

(D) bigger pieces of food are broken down into smaller pieces and saliva is properly mixed with it

3. The wave of contractions that pushes the food through the alimentary canal is called

(A) peritoneum (B) peristalsis (C) cyclosis (D) polarisation

4. In amoeba absorption of the digested nutrients occurs in

(A) contractile vacuole (B) plasma membrane (C) cytoplasm (D) pseudopodia

5. Coiled and well developed alimentary canal first developed in

(A) Protozoans (B) Mammals (C) Arthropods (D) Poriferans

6. Digestion of starch starts from

(A) stomach (B) intestine (C) esophagus (D) mouth

7. The path taken by food material after ingestion is represented by

(A) Mouth $\rightarrow$ Pharynx $\rightarrow$ Oesophagus $\rightarrow$ Stomach

(B) Mouth $\rightarrow$ Pharynx $\rightarrow$ Oesophagus $\rightarrow$ Small Intestine

(C) Mouth $\rightarrow$ Oesophagus $\rightarrow$ Stomach $\rightarrow$ Pharynx

(D) Oesophagus $\rightarrow$ Mouth $\rightarrow$ Pharynx $\rightarrow$ Stomach

8. Teeth involved in cutting of food material are called

(A) canines (B) incisors (B) molars (D) premolars

9. Ptyalin enzyme is secreted by

(A) salivary glands (B) mouth (C) esophagus (D) stomach

10. Villi are present on

(A) stomach (B) large intestine (C) small intestine (D) mouth

SUBJECTIVE QUESTIONS

VERY SHORT ANSWER TYPE QUESTION

1. What is the product formed during C_3 cycle of dark reaction of photosynthesis ?

2. Where does the absorption of food takes place ?

3. Name five different types of glands involved in human digestive system

LONG ANSWER TYPE QUESTIONS

4. Explain various digestive glands present in man along with their secretions & functions.

5. Explain dark reaction of Photosynthesis.

6. What is photophosphorylation ? Explain cyclic and monocyclic photophosophorylation in brief.

7. What are the various factors that affect photosynthesis explain each of them in brief ?

8. **(i)** Explain why the rate of photosynthesis in plants is low both at lower and higher temperatures ?
(ii) Is green light most or least useful in photosynthesis and why ?
(iii) Describe and activity to show that chlorophyll is necessary for photosynthesis in plants.

9. What is the function of gizzard in grasshopper. Draw a labelled diagram showing the digestive system of grasshopper ?

10. What is the importance of the following process occurring during photosynthesis in plants ?
(i) Emission of electrons from chlorophyll (ii) Photolysis of water

11. What is meant by utilization of food ? Name the digestive gland of grasshopper.

ANSWERS

DAILY PRACTIVE PROBELSM # 1

Qus.	1	2	3	4	5	6	7	8	9	10
Ans.	D	D	B	B	C	B	D	C	A	A

DAILY PRACTIVE PROBLEMS # 2

Qus.	1	2	3	4	5	6	7	8	9	10
Ans.	A	B	C	A	C	A	C	A	B	B

DAILY PRACTIVE PROBLEMS # 3

Qus.	1	2	3	4	5	6	7	8	9	10
Ans.	B	D	B	A	C	D	A	B	A	C