



MATRIX
OLYMPIAD

The Most Innovative Talent Recognition Exam

BIOLOGY

Class – VII



MATRIX

Campus : Piprali Road, Sikar, Rajasthan 332001

Phone : 01572-241911, 01572-243911

Website: www.matrixedu.in

Few words for the Readers

Dear Reader,

"Matrix Olympiad is established to encourage school students to go a step further than their regular studies, and get a chance and exposure to competition on a wide scale. It also helps students enhance their learning of basic cognitive skills and deeper knowledge of subjects like Science, Mathematics, English, Mental Ability, Social Studies. "Matrix Olympiad helps students nurture their minds for higher targets of tomorrow and enables them to study School for JEE, NEET, CLAT, NDA, Olympiads , NSEJS, NTSE , STSE etc."

The above thought has been our guiding principle while designing and collating the study material for **Matrix Olympiad** . And hence, we hope that this particular material will be helpful towards your preparation for **Matrix Olympiad**.

Our team at **MATRIX** has put in their best efforts for making this particular module interesting and relevant for you. Additional efforts have been made to ensure that the content is easy to understand and error free to the extent possible. However, there might remain some inadvertent errors in answer keys and theoretical portion and we would welcome your valuable feedback regarding the same.

If there are any suggestions for corrections, please write to us at smd@matrixacademy.co.in and we would be highly grateful.

Finally, we would like to end this message by a famous quote by Ernest Hemingway - *"There is no friend as loyal as a book."* So, please give your study material the time and attention it deserves, and it will surely help you reach newer heights in your fight with competition examinations.

With love and best wishes !

Team MATRIX

CONTENTS

S. NO.	CHAPTER	PAGE NO.
1.	NUTRITION IN ANIMALS	03 – 26
2.	NUTRITION IN PLANT	27 – 42
3.	WEATHER, CLIMATE, ADAPTATIONS FINAL	43 – 64

NUTRITION IN ANIMALS

1

Concepts

Introduction

1. *Nutrition in Amoeba*
2. *Nutrition in Humans*
 - 2.1 *Alimentary Canal*
 - 2.2 *Digestive Glands*
3. *Physiology of Digestion in Human Being*
4. *Ruminants Digestive System*
5. *Disease Related to Digestive System*
 - 5.1 *Diarrhoea*
 - 5.2 *Vomitting*
 - 5.3 *Constipation*
 - 5.4 *Indigestion*

Solved Examples

Exercise – I (SCQ Type)

Exercise – II (Board Pattern Type)

Answer Key



INTRODUCTION

• In unicellular organisms a single cell is responsible for carrying out all the vital activities.

• In multicellular organisms a well develop digestive system is present.

→ Digestion in animals consist of following steps :

(i) **Ingestion** : The process of intake of food.

(ii) **Digestion** : It is the breakdown of large and complex molecules into simple, smaller and soluble forms.

(iii) **Absorption** : Taking up of the digested food through intestinal wall to blood.

(iv) **Assimilation** : In this process absorbed food is taken by body cells.

(v) **Egestion** : The process by which undigested matter is expelled out.

1. NUTRITION IN AMOEBA

• It is a unicellular organism living in water.

• Mode of nutrition is holozoic.

• The process of obtaining food is by phagocytosis (cell eating)

→ Steps involved in digestion of amoeba are :

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

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

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

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

(v) **Egestion** : Undigested food is thrown out from the body.

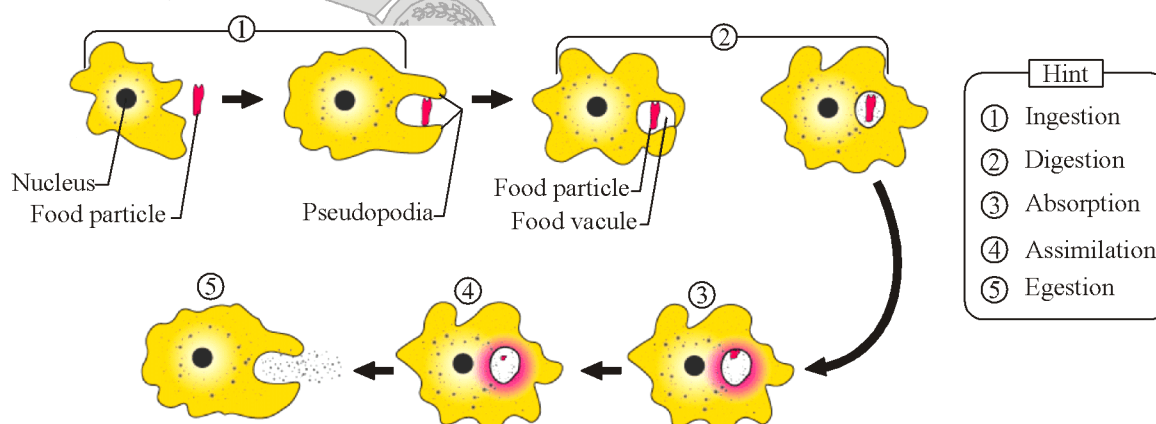


Figure : Digestion in Amoeba



Focus Point

- **Carbohydrates :** The term carbohydrate refers to any one of a huge group of compounds that contain the elements carbon (C), oxygen (O) and hydrogen (H) and have the general formula $C_x(H_2O)_y$. Examples of carbohydrates include sugars and starch. It is the main energy source of living organisms.
- **Proteins:** Protein are a category of compounds formed from the elements carbon (C), hydrogen (H), Oxygen (O) and Nitrogen, and in some cases also Sulphur (S) and Phosphorus (P).
- **Peptones:** Peptones are large protein fragments that result from the action of enzymes on proteins in the initial stages of breaking-up proteins.
- **Enzyme:** Enzymes are proteinaceous that increase the rate of biological reactions without being used-up in the reactions themselves. That is enzymes can act as catalysts. Enzymes form within living cells and may act either within the cell or outside it.
- Starfish feeds on animals covered by hard shells of calcium carbonate. After opening the shell, the starfish pops out its stomach through its mouth to eat the soft animal inside the shell. The stomach then goes back into the body and the food is slowly digested.

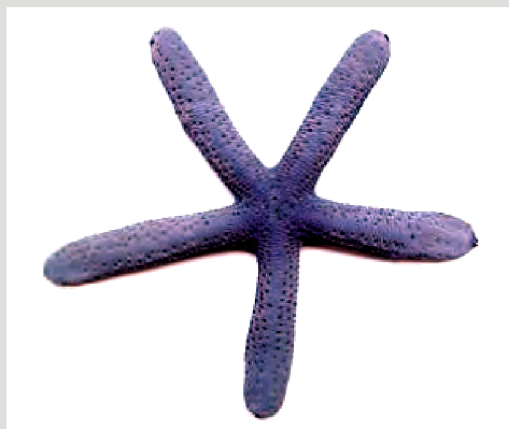


Figure : Starfish

2. NUTRITION IN HUMANS

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

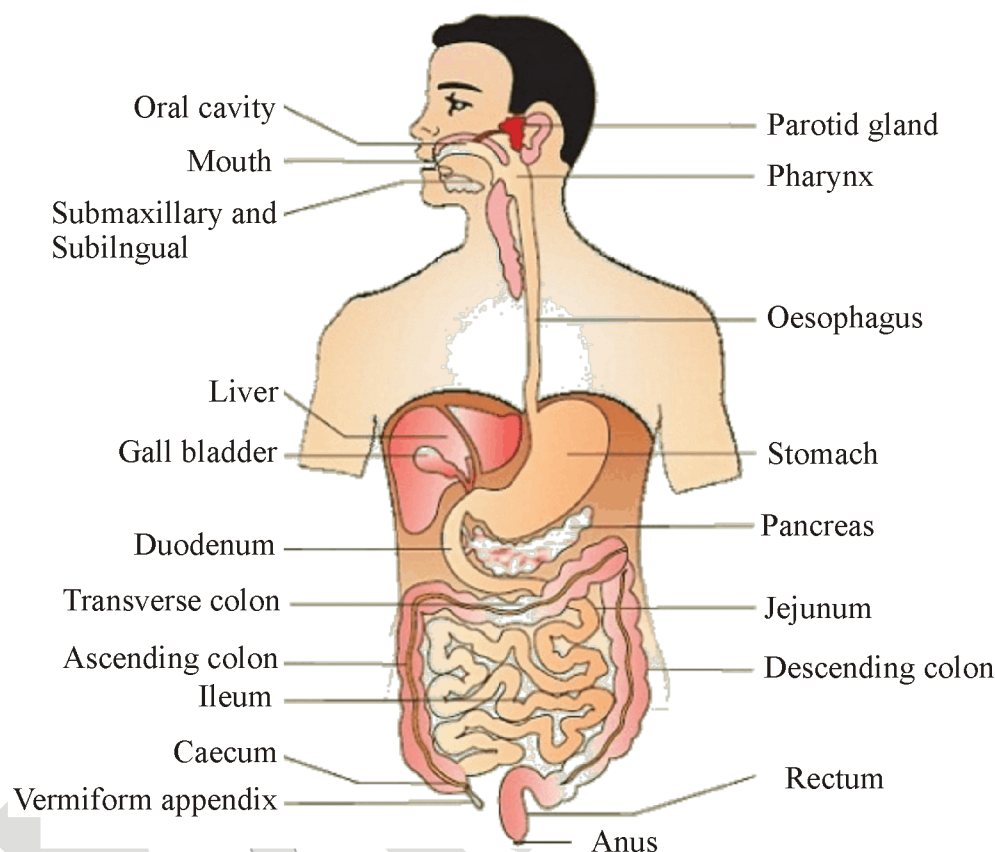


Figure : Digestive system of human

2.1 ALIMENTARY CANAL

- Long, hollow, tubular structure consisting of various organs for digestion
- Alimentary canal consists of following organs :

(A) Mouth :

- It is a small slit through which food is ingested.

(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, and speaking. Human tongue having taste buds for taste of food.

→ **SALIVARY GLANDS :**

- Three pairs of salivary glands are found in mouth cavity.
- They secrete an enzyme called salivary amylase or ptyalin.
- It helps in digestion of starch.

→ **TONGUE :**

- Tongue helps in mixing of food with saliva as well as it helps in recognizing taste of food.
- It has different taste buds.

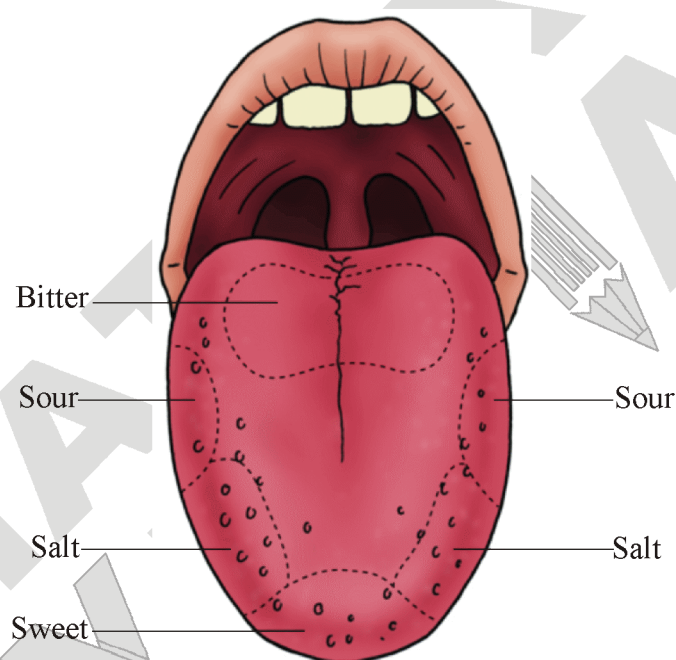


Figure : Location of Taste Buds on tongue

→ **TEETH**

- These are hard bony structure which helps in chewing. Human have four different types of teeth which are fixed in jaw.
- Jaws present in buccal cavity are provided with four different types of teeth :

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

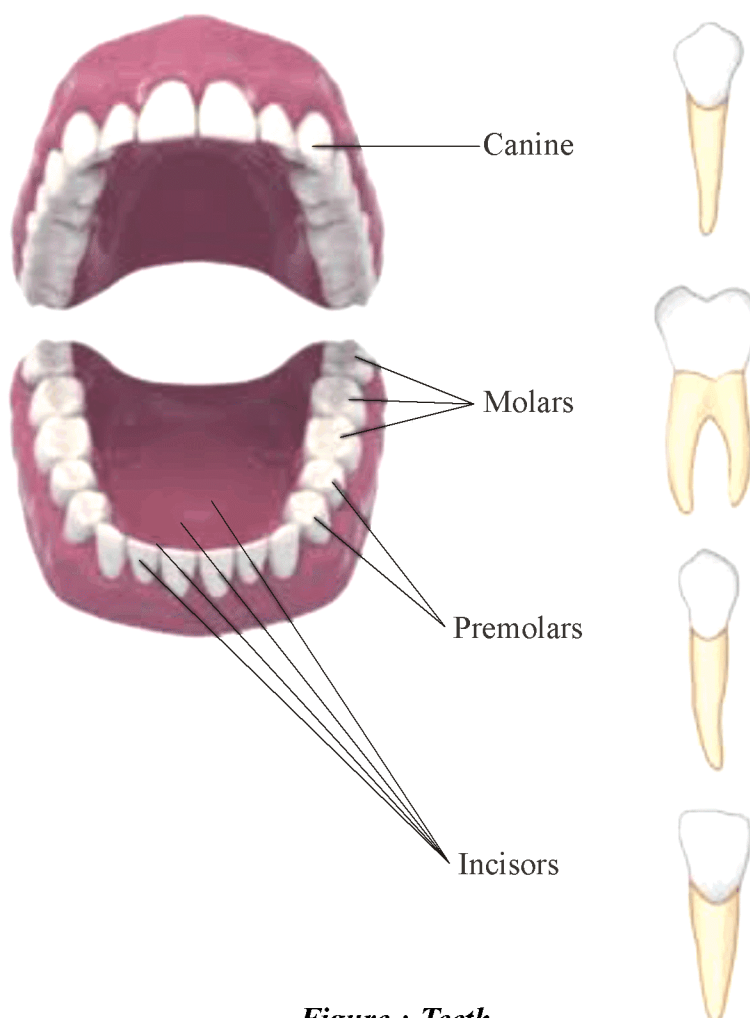


Figure : Teeth

• **DENTAL FORMULA OF HUMANS :**

(i) Milk teeth :

- These are temporary, arise at 6 – 11 month age, 20 in number.
- Premolar absent in milk teeth :

(ii) Permanent teeth :

- arise at 6 – 12 years, 32 in number.



BUILD THE CONCEPT

SWEETS AND TOOTH DECAY

Normally bacteria are present in our mouth but they are not harmful to us. However, if we do not clean our teeth and mouth after eating, many harmful bacteria also begin to live and grow in it. These bacteria break down the sugars present from the left over food and release acids. The acids gradually damage the teeth. This is called tooth decay. If it is not treated in time, it causes severe toothache and in extreme cases results in tooth loss. Chocolates, sweets, soft drinks and other sugar products are the major culprits of tooth decay.

Therefore, one should clean the teeth with a brush or datun and dental floss (a special strong thread which is moved between two teeth to take out trapped food particles) at least twice a day and rinse the mouth after every meal. Also, one should not put dirty fingers or any unwashed object in the mouth.

Sometimes when you eat in a hurry, talk or laugh while eating, you may cough, get hiccups or a choking sensation. This happens when food particles enter the windpipe. The windpipe carries air from the nostrils to the lungs. It runs adjacent to the foodpipe. But inside the throat, air and food share a common passage. Then how is food prevented from entering the windpipe? During the act of swallowing a flap-like valve closes the passage of the windpipe and guides the food into the foodpipe. If, by chance, food particles enter the windpipe, we feel choked, get hiccups or cough.

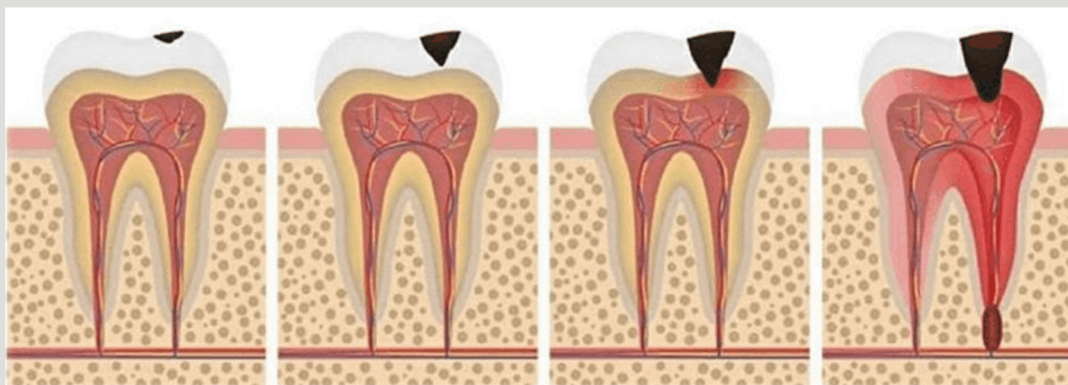


Figure : The stage of tooth decay

(D) Pharynx

- It is the part where mouth and nose meets in buccal cavity.
- It is a common part of digestive system and respiratory system

(E) Oesophagus / Esophagus :

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

(F) Stomach :

- Stomach is a muscular organ located on left side of the upper abdomen. The stomach receive food from the esophagus.
- It is a 'J' shaped bag present on left side of abdomen. It contains several glands present on the inner surface of its wall, which secrete gastric juice.

(G) Intestine : It is a 7.5 metre long. Intestine divide into two parts-

(a) Small Intestine :

- It is a coiled and narrow tube-which is 6 m long having 3 regions :
 - (i) Duodenum
 - (ii) Jejunum
 - (iii) 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.

(b) Large Intestine :

- Small intestine opens into large intestine which is wider and shorter and is above 1.5 m in length. From here the undigested food material is passed to anus through rectum. It is divided into three parts :
 - (i) Caecum
 - (ii) Colon
 - (iii) Rectum

(H) Anus : Last part of digestive system which is helpful in egestion.

2.2 DIGESTIVE GLANDS

- They secrete enzymes / hormones which help in digestion.
- (a) Gastric glands :** Present in stomach. They secrete hydrochloric acid, protein digesting enzymes and mucus.

- (b) **Liver** : It is the largest gland, secretes bile into the small intestine. Bile contains bile juice and bile pigments, which in absorption of fats in gall bladder.
- (c) **Pancreas** : It lies just below the stomach. It secretes pancreatic juice into small intestine. Pancreatic juice contains **trypsin and pancreatic amylase** which is released into the duodenum by a common duct along with bile. Besides these two enzymes pancreas secretes two hormones also i.e glucagon, insulin so it has both exocrine as well as endocrine functions.

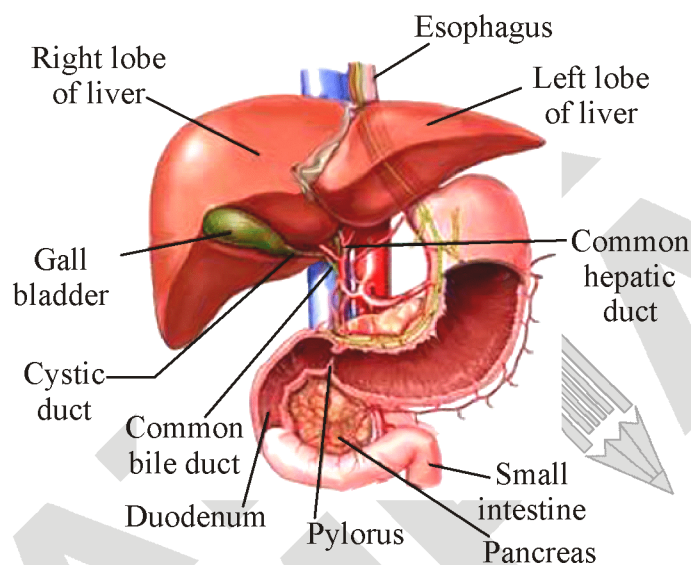


Figure : Liver and pancreas

3. PHYSIOLOGY OF DIGESTION IN HUMAN BEING

(a) INGESTION :

- Intake of food is done through mouth, food is then chewed and masticated and sent to oesophagus through pharynx by swallowing.

(b) DIGESTION :

- Saliva secreted in buccal cavity starts digestion of starch into maltose. This partially digested food is then passed to stomach by oesophagus through peristaltic movement. Food is churned in stomach for about three hours and broken down into smaller pieces. Due to presence of hydrochloric acid (HCl), medium of stomach becomes acidic. In acidic medium protein digesting enzyme pepsin break down proteins into peptones, Gastric lipase is also secreted here which partially break down lipids.
- 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 fats occurs at this place.
- Here in the duodenum fats are emulsified by bile, remaining proteins are digested by trypsin and starch digest by pancreatic amylase.

- 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 \longrightarrow Glucose

Proteins \longrightarrow Amino acids

Fats \longrightarrow Fatty acids and glycerol

(c) ABSORPTION OF DIGESTED FOOD :

(i) ABSORPTION OF FOOD IN SMALL INTESTINE:

- The digested food is absorbed mainly in small intestine. For efficient absorption of nutrients, the intestine has the following features:
- Intestine is very long.
- The lining of intestine is thin to allow rapid entry of substances.
- The inner wall of intestine contains numerous finger-like projections called villi (Sing : vilus).
- The villi increase surface area of intestine to about five times for the absorption of digested food.
- Each vilus is supplied with an arteriole, a venuie and blood capillaries, a lymph vessel or lacteal and lymph capillaries.

(ii) ABSORPTION IN LARGE INTESTINE:

- Large intestine is about 1.5 metres long. It absorbs water and some salts from undigested food.

(d) ASSIMILATION OR THE FATE OF ABSORBED NUTRIENTS OF FOOD :

- The absorbed nutrients are passed into the blood vessels and transported to different parts of the body. Inside the body cells, these nutrients are utilised for different activities. This is called assimilation. The future of absorbed nutrients is as follows;
- Glucose is used as a source of energy by the body, it is burned (oxidised) to release energy inside the cells. Excess of glucose is stored in the cells of liver as glycogen.
- The amino acids are used to build new living material of the cells.
- Fats are stored in the fatty tissues in various parts of the body.

(e) EGESTION OF UNDIGESTED FOOD OR EGESTION :

- The undigested food is then collected in large intestine where water is absorbed and remaining waste is expired out or egested through anus. The semisolid undigested food is pushed out of the anus. This is called egestion or defecation. The undigested food residue that enters the rectum from large intestine is faeces. This faeces defecate out by anus.

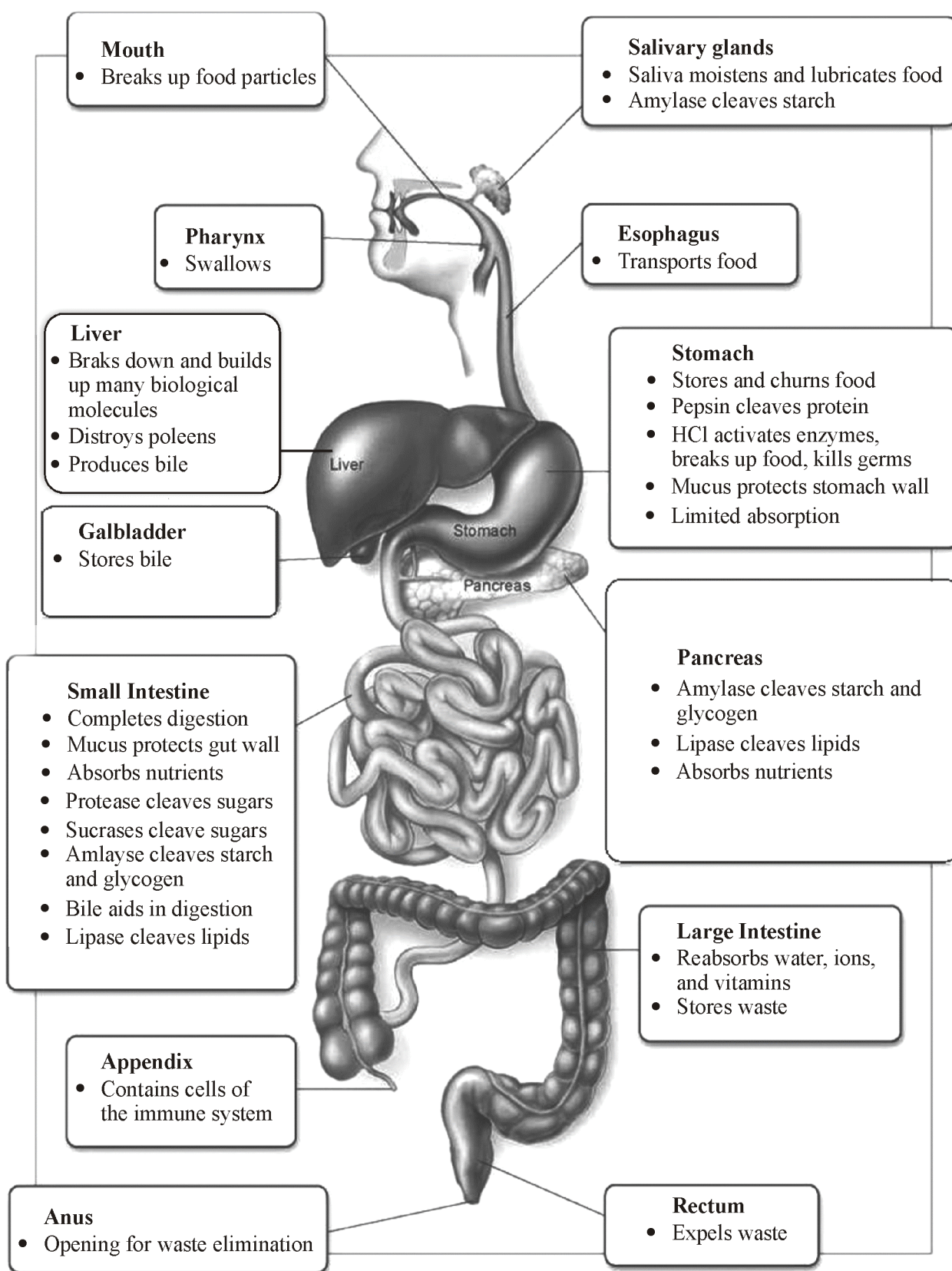


Figure : Process of Digestion

4. RUMINANTS DIGESTIVE SYSTEM

- Ruminants are mammals that are able to acquire nutrients from plant-based food by fermenting it in a specialized stomach prior to digestion, principally through microbial actions. The process typically requires the fermented ingesta (known as cud) to be regurgitated and chewed again. The process of rechewing the cud to further break down plant matter and stimulate digestion is called rumination.
- The word "ruminant" comes from the Latin *ruminare*, which means "to chew over again". The primary difference between a ruminant and non-ruminant is that ruminants have a four-compartment stomach. The four parts are the rumen, reticulum, omasum, and abomasum.
- In the first two chambers, the rumen and the reticulum, the food is mixed with saliva and separates into layers of solid and liquid material. Solids clump together to form the cud or bolus.
- The cud is then regurgitated and chewed to completely mix it with saliva and to break down the particle size.
- Fibre, especially cellulose and hemicellulose, is primarily broken down in these chambers by microbes (mostly bacteria, as well as some protozoa, fungi and yeast) into small and non-structural carbohydrates (pectin, sugars, and starch) are also fermented.

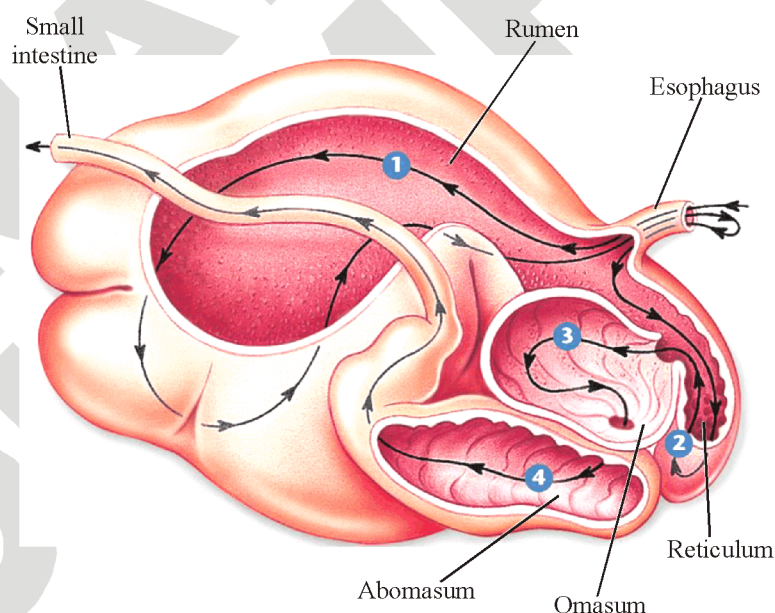


Figure : Stomach of ruminant (cow)

5. DISEASE RELATED TO DIGESTIVE SYSTEM

5.1 DIARRHOEA

- Sometime you may have experienced the need to pass watery stool frequently. This condition is known as diarrhoea. It may be caused by an infection, food poisoning or indigestion. It is very common in India, particularly among children. Under severe conditions it can be fatal. This is because of the excessive loss of water and salts from the body. Diarrhoea should not be neglected. Even before a doctor is consulted the patient should be given plenty of boiled and cooled water with a pinch of salt and sugar dissolved in it. This is called Oral Rehydration Solution (ORS).

5.2 VOMITING

- It is the ejection of stomach contents through the mouth. This reflex action is controlled by the vomit centre in the medulla. A feeling of nausea precedes vomiting.

5.3 CONSTIPATION

- In constipation, the faeces are retained within the colon as the bowel movements occur irregularly.

5.4 INDIGESTION

- In this condition, the food is not properly digested leading to a feeling of fullness. The causes of indigestion are inadequate enzyme secretion, anxiety, food poisoning, over eating, and spicy food.



Focus Point

- **Peristalsis** : Peristalsis is a wave-like movement (motion) that progresses along some of the hollow tubes of the body that have circular and longitudinal muscles, such as the intestines. Peristalsis happens involuntarily.
- **Emulsification** : The process in which bile juice mix with fat to convert into small droplets, so that its easier to digest by the action of lipase.

SOLVED EXAMPLES

SE. 1

Write short notes on the following :

- (i) Mastication
- (ii) Functions of tongue
- (iii) Large intestine

Ans. **(i) Mastication** – The process of chewing food which involves movement of jaws and teeth is called mastication. It breaks down the food into small particles and allows the mixing of saliva with it.

(ii) Functions of tongue:

- The tongue helps us to taste the food.
- It moves food in our mouth between the teeth for chewing.
- It mixes saliva with food while chewing.
- It helps us to swallow the food.

(iii) Large intestine – Large intestine is about 1.5 m in length. It is wider and shorter than small intestine. Its functions are

- To absorb water and some salts from the undigested food coming from small intestine
- To eliminate waste matter in the form of faeces through anus.

SE. 2

Cows and buffaloes are usually seen chewing continuously even when they are not grazing. Explain.

Ans. Cows and buffaloes are ruminants. These animals, during grazing, quickly swallow a large amount of food without much chewing. This partly chewed food is then sent to rumen (a part of stomach) where partial digestion of food takes place. This partially digested food is called cud and is brought back into the mouth in small lumps and animal chews it further. Thus, whenever we see a cow or buffalo sitting and chewing, at that time they are actually chewing the cud.

SE. 3

How does the digestion of food take place in stomach?

Ans. In stomach, mechanical digestion of food occurs by alternate contraction and expansion of stomach wall. The thick muscular walls of stomach contract to churn the food and mix it with digestive juice, then chemical digestion of food starts during which digestive enzymes break down proteins into simpler forms (i.e., amino acids). Partial digestion of food takes place in stomach and this partly digested food then enters small intestine.

SE. 4

Why is the fibre-rich diet important for digestive system?

Ans. Fibre-rich diet contains roughage (or fibre) which helps to stimulate waves of peristalsis along the alimentary canal especially in the region of small intestine. It results in pushing of food along the alimentary canal and facilitates removal of undigested waste matter from the body, thereby helping to reduce the chances of constipation.

SE. 5

What are the products of fat digestion?

Ans. Products of fat digestion are fatty acids and glycerol.

SE. 6

The basic process of digestion and release of energy is the same in almost all animals. Justify this statement.

Ans. Although modes of feeding are different in different animals, but almost all the animals secrete digestive juices to digest the food i.e., to breakdown food into simple absorbable form. In the cells, absorbed food is then broken down into still simpler

compounds with the release of energy through the process of respiration. Thus, the basic process of digestion and release of energy is the same in almost all animals.

SE. 7

Why small intestine is considered as the major site for digestion and absorption of nutrients?

Ans. Small intestine receives bile from liver, pancreatic juice and releases intestinal juice of its own. Small intestine completes the digestion of all the components of food. Carbohydrates are broken down into simple sugars such as glucose, fats into fatty acids and glycerol and proteins into amino acids. About 90% of all absorption of nutrients occurs in small intestine. Thus, small intestine is the major site for digestion and absorption of nutrients.

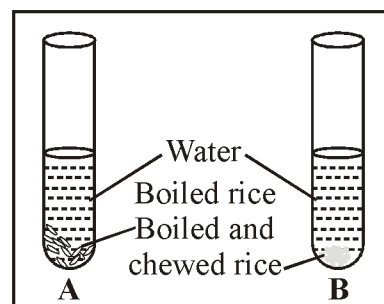
SE. 8

What causes tooth decay?

Ans. If we do not maintain oral hygiene and do not eat healthy food, then bacteria and food components accumulate on our teeth in the form of plaque. These bacteria break down the sugars present in the left over food and release acids. The acids gradually the teeth and result in tooth decay.

SE. 9

Study the given experimental set-up. The tube A contains boiled rice + 3-4 ml water, test tube B contains boiled and chewed rice + 3-4 ml water. What will you observe after pouring 2-3 drops of iodine solution in each test tube?



Ans. After pouring iodine solution in test tube A it turns blue-black due to the presence of starch in boiled rice. In test tube B, there was no change in colour on adding iodine solution because starch has been converted into simple sugars during chewing by the action of salivary amylase.

SE. 10

What are villi? What role do they play in absorption of food?

Ans. Villi are small finger-like projections present on the inner walls of small intestine. These increase the surface area for absorption of digested food. Each villi has a network of thin and small blood vessels close to its surface. Surface of villi absorbs the digested food materials.

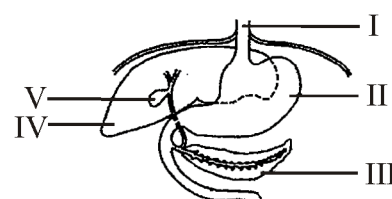
SE. 11

What do you understand by enamel?

Ans. Enamel is the white substance that covers the tooth. It is the hardest substance of human body.

SE. 12

Refer the given diagram which shows various parts of the human digestive system labelled as I, II, III, IV and V and answer the following questions.



(a) The labels I, II and III represent _____, _____ and _____ respectively.

(b) Name the secretion produced by organ IV and explain how does it help in fat digestion.

(c) What is the function of organ V in human digestive system?

Ans. (a) Oesophagus, stomach, pancreas

(b) Organ IV is liver which produces bile. Bile is sent to small intestine where it gets mixed with fats present in food and converts them into small fat droplets. The later are then digested and absorbed in small intestine.

(c) Organ V is gall bladder which stores the bile temporarily.

SE. 13

Name the different components i.e., nutrients present in food.

Ans. The different nutrients present in food are carbohydrates, fats, proteins, minerals, vitamins etc.

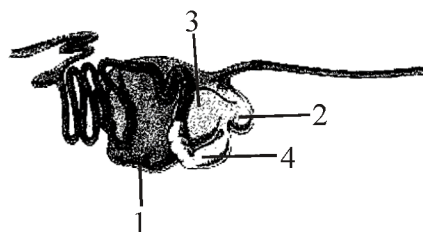
SE. 14

How does food move in the opposite direction during vomiting?

Ans. Food is pushed down by contraction and relaxation of the walls of the food pipe. This movement, called peristalsis takes place throughout the alimentary canal and pushes the food downwards. But when our stomach is completely full or even after eating stale food, the food is not accepted by our stomach, therefore, it is pushed in the opposite direction and vomited out. Direction of peristaltic movements is reversed during vomiting.

SE. 15

Refer the given diagram of a ruminant stomach and identify the parts labelled as 1, 2, 3 and 4.



Ans. 1 - Rumen,
2 - Reticulum,
3 - Omasum,
4 - Abomasum

EXERCISE – I

ONLY ONE CORRECT TYPE

1. The end product of fat digestion is -
(A) Glucose
(B) Fatty acids & glycerol
(C) Amino acids
(D) Alkaloids
2. The action of bile can be called -
(A) Oxidation (B) Emulsification
(C) Esterification (D) Dehydrogenation
3. Which set is mixed with the food in small intestine?
(A) Saliva, gastric juice, bile
(B) Gastric juice, bile, pancreatic juice
(C) Bile, pancreatic juice, succus entericus
(D) Bile, pancreatic juice and saliva
4. A good source of lipase is -
(A) Saliva (B) Gastric juice
(C) Bile (D) Pancreatic juice
5. Enzymes required for digestion of fat is -
(A) Amylase (B) Trypsin
(C) Pepsin (D) Lipase
6. Ptyalin is an enzyme present in -
(A) Gastric juice (B) Pancreatic juice
(C) Intestinal juice (D) Saliva
7. Which one does not produce any digestive enzyme?
(A) Pancreas (B) Liver
(C) Stomach (D) Duodenum
8. The number of salivary glands present in human beings is -
(A) 5 pairs (B) 4 pairs
(C) 3 pairs (D) 2 pairs
9. Largest gland in the body is -
(A) Liver (B) Pancreas
(C) Gastric gland (D) Adrenal
10. Which of the following has no digestive enzyme?
(A) Saliva (B) Bile
(C) Gastric juice (D) Intestinal juice
11. The main organ for digestion and absorption of food is -
(A) Large intestine (B) Small intestine
(C) Stomach (D) Liver
12. Liver helps in -
(A) Digestion of food
(B) Detoxification
(C) Secretion
(D) All of these
13. Food pipe is the another name of -
(A) Oesophagus (B) Bile duct
(C) Salivary gland (D) Pancreatic duct
14. Total number of canines in permanent dental set of human is -
(A) 4 (B) 6
(C) 2 (D) 12
15. Starch is digested by -
(A) Peptidase (B) Amylase
(C) Lipase (D) Proteinase
16. Bile is produced by -
(A) Stomach (B) Liver
(C) Gall bladder (D) Pancreas
17. The liver stores food in the form of
(A) Glucose (B) Glycogen
(C) Albumen (D) ATP
18. Vermiform appendix is a part of
(A) Alimentary canal
(B) Nervous system
(C) Vascular system
(D) Reproductive system
19. Absorption of food occurs in -
(A) Stomach (B) Large intestine
(C) Liver (D) Small intestine

20. Wisdom teeth in man are
 (A) Incisor (B) Canine
 (C) Last molars (D) All of these
21. Digestion is
 (A) Conversion of large food particles into small food particles
 (B) Conversion of small food particles into large food particles
 (C) Conversion of food into protoplasm
 (D) Conversion of non-diffusible food particles into diffusible food
22. Muscular contractions of alimentary canal are
 (A) Circulation (B) Deglutition
 (C) Peristalsis (D) Churning
23. Which of the following regions of the alimentary canal of man does not secrete a digestive enzyme?
 (A) Oesophagus (B) Stomach
 (C) Duodenum (D) Mouth
24. The incisor tooth is meant for
 (A) Biting and cutting
 (B) Chewing
 (C) Munching and chewing
 (D) Munching
25. A bolus is
 (A) A mass of crushed food moistened with saliva
 (B) The semisolid material resulting from partial digestion in the stomach
 (C) The milky emulsified fat absorbed from small intestine
 (D) Indigestible materials that helps in movement and absorption

ASSERTION & REASON TYPE

Directions :

- (A) Both A and R are true and R is the correct explanation of A.
 (B) Both A and R are true but R is not the correct explanation of A.
 (C) A is true but R is false.
 (D) A is false but R is true.

- Assertion :** Tongue is a fleshy muscular organ.
Reason : Tongue is used for talking.
- Assertion :** The small intestine is about 6m long and highly coiled.
Reason : It is smaller as compared to large intestine.
- Assertion :** Liver secretes a juice called bile juice.
Reason : Bile juice helps in digestion of fats.

PARAGRAPH

PARAGRAPH # 1

Jaya returned from school and found that grandmother was scolding her maid, Rani as she did not come yesterday. The maid told that his son was passing watery stools frequently that's why she didn't come. Jaya's mother who was listening the discussion came to them and told Rani not to come for coming 3-4 days. She also suggested her to give his son a solution of sugar and salt in clean water, many times a day for fast recovery. Jaya was surprised. She rushed to her mother and asked the scientific reason for it.

- Diarrhoea occurs due to :
 (A) Infection (B) Food poisoning
 (C) Indigestion (D) All of these
- Select the solution help in diarrhoea.
 (A) ORS (B) Cough syrup
 (C) Banana juice (D) All of these

3. Diarrohea is related to which system.

- (A) Respiration (B) Digestion
(C) Excretion (D) Nervous

PARAGRAPH # 2

Bile juice is stored in a sac called, gall bladder, located near its organ of secretion, liver. The gall bladder releases the bile juice into the small intestine whenever food reaches there, Though bile juice is devoid of any digestive enzymes, it is required for the digestion of fats. the fats cannot be digested easily because they are insoluble in water and are present as large globules.

1. Bile juice is stored in _____.
(A) Lungs (B) Gall bladder
(C) Kidney (D) Stomach
2. In which part of body fats are digested.
(A) Stomach (B) Small intestine
(C) Caecum (D) Rectum
3. Fats are _____.
(A) Soluble in water
(B) Insoluble in oil
(C) Insoluble in water
(D) None of these

MATCH THE COLUMN TYPE

1. **Column-A** **Column-B**
 (i) Starch (a) Rennin
 (ii) Milk (b) Liver
 (iii) Fats (c) Amylase
 (iv) HCl (d) Bile juice
 (v) Bile juice (e) Gastric gland
2. **Column-A** **Column-B**
 (i) Small intestine (a) For tearing of food
 (ii) Canines (b) Caecum
 (iii) Liver (c) for grinding of food
 (iv) Molar (d) Ileum
 (v) Large intestine (e) Largest gland

EXERCISE – II

VERY SHORT ANSWER TYPE

1. Name the organs that make the alimentary canal.
2. Mention the various steps involved in the process of nutrition.
3. Which type of carbohydrate cannot be digested by humans ?
4. What is the role of hydrochloric acid in the stomach ?
5. Why do we call animals heterotrophs ?
6. Name the type of nutrition in amoeba.
7. Which organs help to sense the different taste ?
8. Differentiate between ingestion and egestion.
9. What is the function of villi ?
10. What is Digestion ?

SHORT ANSWER TYPE

1. What happens to digested food after absorption ?
2. How does an amoeba capture its food ?
3. What are villi ? What is their location and function ?
4. What is the juice secreted by the liver called ? What does it do ?
5. What is pancreas and where is it located ?

LONG ANSWER TYPE

1. Draw a diagram of the tongue to show the location of various taste buds.
2. Give an account of the various modes in which animals obtain food.
3. Draw a labelled diagram of the alimentary canal of humans.

4. What are digestive glands ? Name three such glands that are present in the human body. What are their secretions called ?
5. What happens to the food in the small intestine ?

TRUE / FALSE TYPE

1. Villi are small projections in the inner wall of small intestine that help in absorption of food.
2. Bile juice is produced by gall bladder.
3. Tongue helps in mixing of saliva with food.
4. Mastication is the chewing of food to break it into smaller pieces.
5. Wisdom teeth in man are canines.

FILL IN THE BLANKS

1. Salivary amylase works on
2. Incisor teeth help in the food.
3. The liver and are used for procuring food.
4. In amoeba are used for procuring food.
5. There are number of teeth in a temporary set of teeth.

Answer Key

EXERCISE I

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B	B	C	D	D	D	D	C	A	B	B	D	A	A	B
16	17	18	19	20	21	22	23	24	25					
B	B	A	D	C	D	C	A	A	A					

ASSERTION & REASON

1. B 2. C 3. A

PSCQ-I

1. D 2. A 3. B

PSCQ-II

1. B 2. B 3. C

MATCH THE COLUMN

1. (i) → (c), (ii) → (a), (iii) → (d), (iv) → (e), (v) → (b)

2. (i) → (d), (ii) → (a), (iii) → (e), (iv) → (c), (v) → (b)

EXERCISE II

TRUE/FALSE FALSE

1. T 2. F 3. T 4. T 5. F

FILL IN THE BLANKS

1. Starch 2. Biting and cutting 3. Pancreas
4. Pseudopodia 5. 20

SELF PROGRESS ASSESSMENT FRAMEWORK

(CHAPTER : NUTRITION IN ANIMALS)

CONTENT	STATUS	DATE OF COMPLETION	SELF SIGNATURE
Theory			
In-Text Examples			
Solved Examples			
Exercise I			
Exercise II			
Short Note-1			
Revision - 1			
Revision - 2			
Revision - 3			
Remark			

NOTES :

1. In the status, put “completed” only when you have thoroughly worked through this particular section.
2. Always remember to put down the date of completion correctly. It will help you in future at the time of revision.



Space for Notes :

A series of horizontal dotted lines providing space for notes.



NUTRITION IN PLANTS

2

Concepts

Introduction

1. *Mode of Nutritions*

1.2 *Photosynthesis*

Solved Examples

Exercise – I (SCQ Type)

Exercise – II (Board Pattern Type)

Answer Key

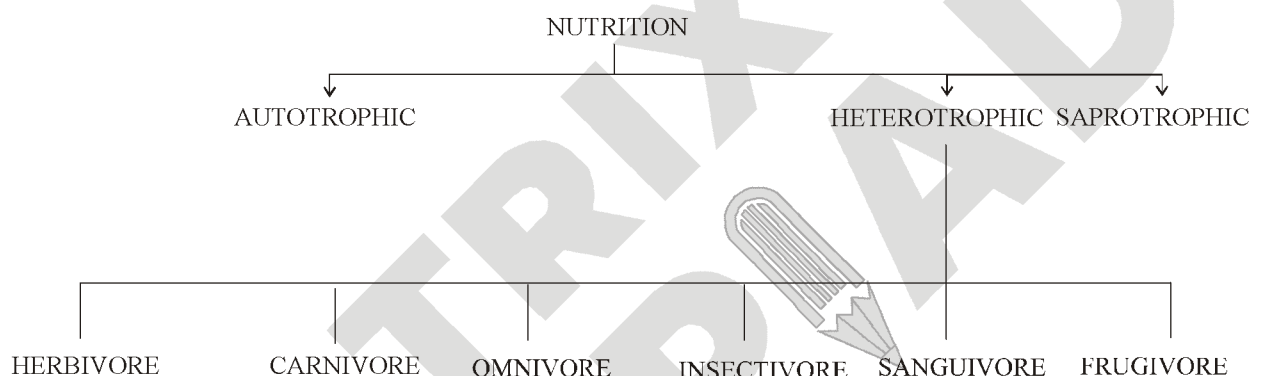


INTRODUCTION

- All organisms need food. They need food for obtaining energy and to get materials required for growth, development and repair of damaged cells and tissues. Though different organisms eat different kinds of food but one thing is common in all food types, that is, all food items contain nutrient.
- Nutrients are the substances that a body needs to live and grow. The energy from nutrients is the fuel that allows the body to carry out all functions — run, jump, walk and swim. Nutrients also provide material for the repair of tissues. They also keep the body healthy.

1. MODE OF NUTRITIONS

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



(a) Autotrophic : (Auto - self, trophic = food)

- It is a mode of nutrition in which organisms prepare their own food. Inorganic molecules like CO_2 & H_2O are converted into organic molecules like carbohydrates in the presence of sunlight & chlorophyll.
E.g :- Green plants.

(b) Heterotrophic (Hetero - different ; trophic - food)

- It is a mode of nutrition in which organisms derive their food from 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:

- **Herbivores** : Animals which eat only plants, e.g. Cow, goat.
- **Carnivores** : They feed on flesh of other animals, e.g. Lion, Tiger.
- **Omnivores**: They feed on both plants and animals, e.g. Dog, human.
- **Detritivores** : Feed on detritus or dead organic remains, e.g. Earthworm.
- **Sanguivorous**: Feed on blood, e.g. Leech, female mosquito.
- **Frugivorous**: Feed on fruits, e.g. Parrot.
- **Insectivores** : Feed on insects, e.g. Bats, House sparrow, Pitcher plant, Venus flytrap.



Figure : Pitcher plants



Figure : Venus flytrap



Focus Point

- Cuscuta (Dodder/ Amarbel) is a parasitic plant which grow on other plant (Host). It wraps itself around the host plant and get nutrition from it by using sucking apparatus
- **Symbiotic Association :** Two organism that live in close physical association and are of mutual benefit to each other, are called symbionts. This condition is known as symbiosis. The common example of symbionts are lichens (association between algae and fungi) and mycorrhiza (association between fungi and the roots of some higher plants).



Figure : Cuscuta



Figure : Lichen

1.2 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.

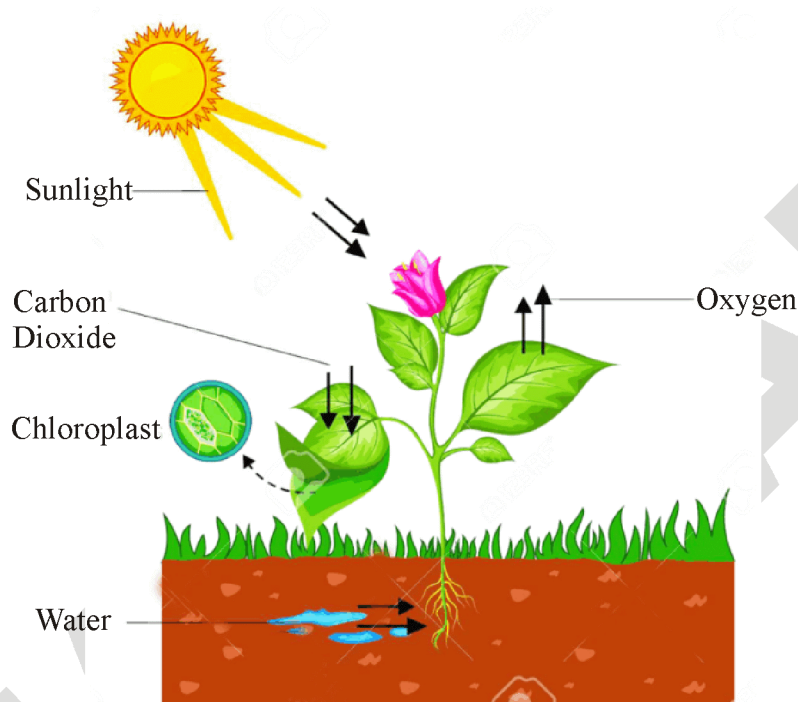
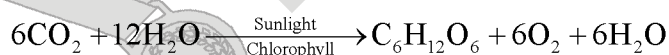


Figure : Photosynthesis

(ii) **Equation of photosynthesis :**



(iii) **Requirements for photosynthesis**

- **Sunlight:** Sun is the ultimate source of energy for all living organism.
- **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.

(iv) **Site of photosynthesis :** The site of photosynthesis is Chloroplast.

- Chloroplast is also called as green plastid.
- Chloroplast also have variable shapes, for example cup shaped, ribbon shaped etc. in algae while it is discoidal in higher plants.

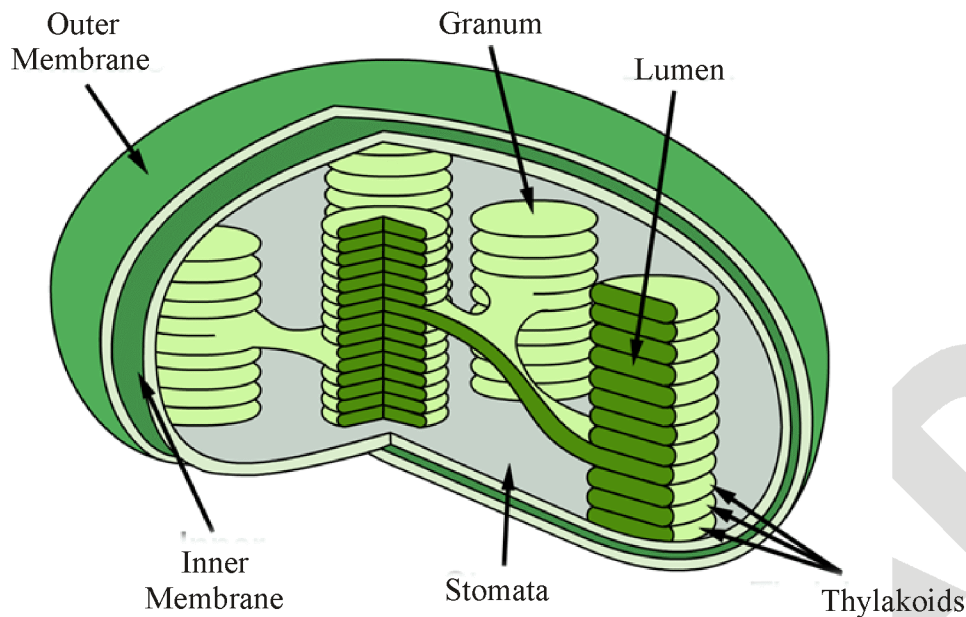


Figure : Ultra Structure of Chloroplast

Each chloroplast is double membranous cell organelle and consists of two parts :-

- (a) Grana:** It constitutes the lamellar system. These are bound layered on top of each other, these stacks are called as Grana.
 - Each granum of the chloroplast is formed by superimposed closed compartments called thylakoids.
- (b) Stroma:** It is a granular transparent substance present in chloroplast also called as matrix. Grana are embedded in it. Besides grana, they also contain lipid droplets, starch grains, ribosomes etc.
- (v) Raw Materials of Photosynthesis :**
 - **Carbon dioxide:** 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 vapour. Stomatal opening is guarded by the presence of guard cells (kidney shaped).

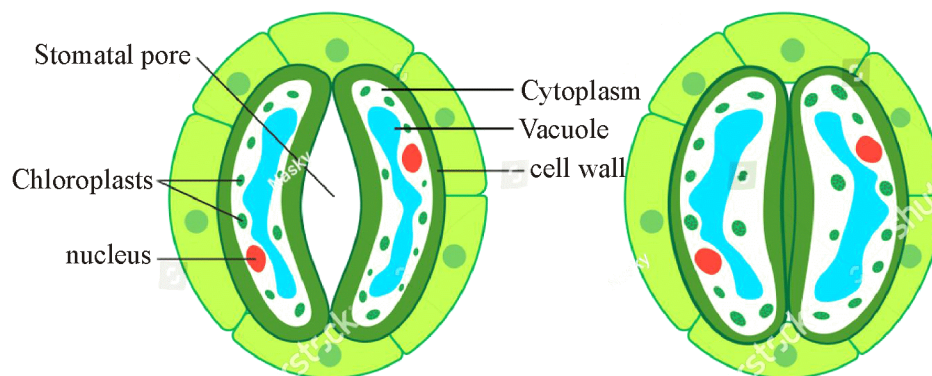


Figure : Structure of stomata

Aquatic plants obtain CO_2 dissolved in water through their general body surface so they perform more photosynthesis than terrestrial plants

- **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.

(vi) Factors affecting photosynthesis:

- **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.
- **Temperature:** Optimum range 25° to 30°C are used for photosynthesis.
- **Carbon dioxide:** Concentration of CO_2 also affects the rate of photosynthesis.
- **Chlorophyll:** Chlorophyll content is directly proportional to rate of photosynthesis.

(vii) Significance of Photosynthesis:

- Production of food material.
- Atmospheric control and purification of air.

LAB TIME

Let's Do & Learn



- **Aim:** Chlorophyll is necessary for photosynthesis.
- **Apparatus.** A destarched potted plant of Croton, Pathos (Money Plant) or coleus having variegated leaves, (with green and non-green parts), rice paper, Soft pencil, Beakers, Petridishes, Burner or spirit lamp, spirit (or 70% alcohol), iodine solution, water, forceps.
- **Procedure:** Destarch a potted plant of Croton or Pothos Green Part (Money Plant) having variegated leaves by keeping it in complete darkness for 2-3 days. Expose the destarched potted plant to sunlight for 2-6 hours. Pluck a variegated leaf. Place a rice paper over it. Draw the outline of green and non-green areas. The green areas contain chlorophyll. The non-green areas are pale in colour and devoid of chlorophyll. Place the leaf in boiling water for 5-10 minutes. Boiling kills the leaf. Dip the leaf in spirit or alcohol kept at 50°-60° C with the help of a water bath. After 30-45 minutes, the leaf will be decolourised completely. Take out the decolourised leaf, dip in hot water for softening the same. Spread the leaf in a petri dish. Pour dilute iodine solution over the leaf. After 4-5 minutes, rise off excess iodine and observed.

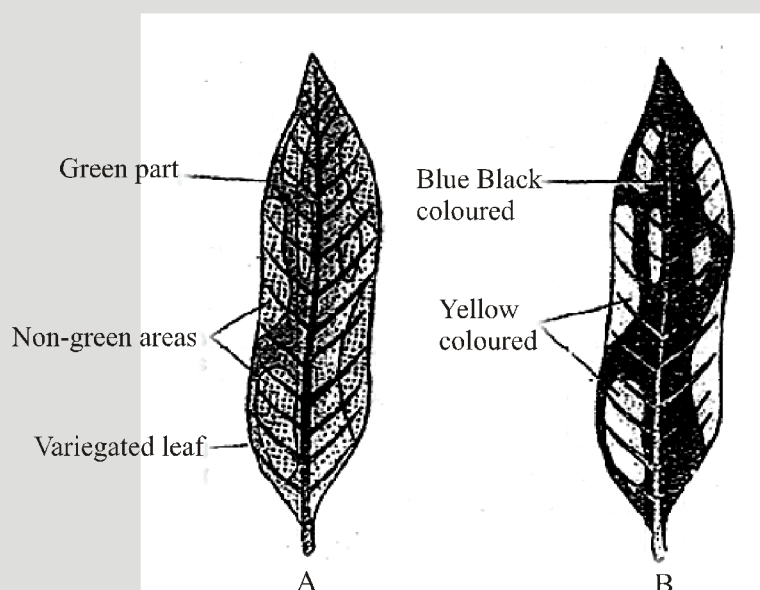


Figure : Chlorophyll is necessary for photosynthesis
Chlorophyll is necessary for photosynthesis.

- **Observation:** The leaf has two types of patches, bluish black and yellowish. The bluish black areas are the ones which have starch. The bluish black colour is due to reaction of iodine with starch. The yellow areas are without starch. Bluish black areas are the ones which were green previously while non-green areas remain pale coloured.

SOLVED EXAMPLES

SE. 1

Study the following table and select the correct words for A, B and C.

Name of the Plant	Presence/ Absence of Leaves	Mode of Nutrition
Mistletoe	A	Partially parasitic
Nepenthes	Present	B
Cuscuta	C	Completely parasitics

Ans. A = Present
B = Partially heterotrophic
C = Absent

SE. 2

If after putting iodine (I_2) solution over a leaf, colour of the leaf is yellow-brown, what can be interpreted about the leaf?

Ans. Yellow-brown colouration of leaf after putting I_2 -solution indicates that starch is not present in the leaf.

SE. 3

Sun is the ultimate source of energy for all living organisms. Justify this statement.

Ans. Green plants, through the process of photosynthesis, convert sunlight energy into chemical energy of food. Herbivorous animals depend directly on plants for their nutrition. Carnivorous animals depend on herbivores for their nutrition. Hence, all the living organisms depend upon plants directly or indirectly for their food requirement. As we know that green plants get the energy to prepare food from the sun. Thus, sun is the ultimate source of energy for all living organisms.

SE. 4

Can insectivorous plants such as pitcher plant be considered as parasites? Why or why not?

Ans. No, insectivorous plants cannot be considered as parasites. An insectivorous plant first kills an insect and then absorbs N_2 -nutrition from it. Thus, it acts as a predator for the insect. On the other hand, a parasitic plant does not at once kill its host organism. It derives its nutrition from a living host plant and deprives it of the valuable nutrients making it weaker.

SE. 5

Why our body cannot make food from carbon dioxide and water like plants do?

Ans. Our body cannot make food from carbon dioxide, and water like plants do because our body has no chlorophyll. Chlorophyll helps to capture the energy of the sunlight. This energy is used by plants to synthesize food from carbon dioxide and water through the process of photosynthesis.

SE. 6

How water and minerals absorbed by roots reach the leaves?

Ans. Water and minerals are transported to the leaves by the xylem vessels which run like pipes throughout the root, stem, branches and the leaves. They form a continuous path for the nutrients to reach the leaf.

SE. 7

What is the significance of boiling the leaf in ethanol while testing it for the presence of starch?

Ans. Ethanol dissolves the green coloured pigment, chlorophyll of the leaf so that the leaf becomes

colourless. This helps to observe the change in colour of the leaf when we pour iodine solution over it. If chlorophyll is not removed using ethanol, it will mask the change in colour of leaf after iodine test.

SE. 8

Differentiate between autotrophic nutrition and heterotrophic nutrition.

Ans. **Autotrophic Nutrition** **Heterotrophic Nutrition**

- | | |
|--|---|
| <p>(i) It is the mode of nutrition in which organisms prepare their own food by themselves using simple inorganic raw materials.</p> | <p>It is the mode of nutrition in which organisms obtain readymade food from plants or other animals.</p> |
| <p>(ii) Examples : Green plants prepare their food by photosynthesis</p> | <p>Examples : Animals, non green plants, fungi etc.</p> |

SE. 9

Fungi are both useful as well as harmful to human beings. Justify this statement.

Ans. Fungi have both useful and harmful effects on human beings. Uses of fungi :

- (i) Some fungi, e.g., mushrooms are edible and form nutritious food.
- (ii) Yeasts are used in baking industry and brewing industry for manufacturing of bread and alcohol respectively.
- (iii) Fungi, being saprotrophic, help in recycling of nutrients in the biosphere.
- (iv) Some fungi are used in the preparation of medicines e.g., Penicillium is used to prepare an antibiotic penicillin.

Harmful effects of fungi :

(i) Fungi (e.g., moulds) spoil our food, clothes, leather goods, wooden articles etc.

(ii) Fungi cause diseases in plants and spoil our food crops.

(iii) Fungi cause diseases in animals and human beings. Diseases caused by fungi are mostly communicable diseases.

SE. 10

In what form is the food prepared by plants during photosynthesis?

Ans. Food is prepared by plants in the form of simple carbohydrates i.e., glucose. After synthesis, glucose is converted into starch and stored in different plant parts.

SE. 11

How do the saprotrophic organisms such as fungi and many bacteria acquire nutrients?

Ans. These organisms secrete digestive juices on the dead and decaying organic matter and convert it into a solution. Then they absorb the nutrients from it.

SE. 12

Write a note on the symbiotic association between leguminous plants and Rhizobium bacteria.

Ans. Leguminous plants and Rhizobium bacteria share symbiotic relationship with each other. Rhizobium can take atmospheric nitrogen and convert it into a soluble form (soluble nitrogenous compounds) in the soil, that the plant can absorb. Rhizobium is a heterotroph and cannot make its own food. It therefore, lives in the roots of leguminous plants like beans, gram peas and moong where it gets food and shelter. In return, it provides the plant with nitrogen.

EXERCISE – I

ONLY ONE CORRECT TYPE

1. Raw materials for photosynthesis :
(A) Carbon dioxide (B) Water
(C) Sunlight (D) All of these
2. An example of an autotrophic plant is _____.
(A) Mushroom (B) Mould
(C) Dodder (D) Neem
3. An example of a saprophytic plant is _____.
(A) Dodder (B) Monotropa
(C) Mushroom (D) All of these
4. Which of these is not necessary for photosynthesis?
(A) Carbon dioxide (B) Chlorophyll
(C) Light (D) Nitrogen
5. Which of the following identify the carnivorous plant-
(A) Pitcher plant (B) Venus fly trap
(C) Both (A) & (B) (D) None of these
6. Grana refers to -
(A) Glucolysis of glucose
(B) By-product of photosynthesis
(C) Stacks of thylakoids
(D) Stacks of quantasomes
7. Autotrophic nutrition occurs in -
(A) Fungi
(B) Plants
(C) Some protists and prokaryotes
(D) Both B and C
8. Mushroom, Rhizopus and Yeast are-
(A) Chemosynthetic (B) Parasitic
(C) Holozoic (D) Saprophytic
9. Chlorophyll is present-
(A) In the grana of chloroplast
(B) On the surface of chloroplast
(C) In the stroma of chloroplast
(D) None of these
10. In bacterial photosynthesis, the hydrogen donor is -
(A) H_2O (B) H_2SO_4
(C) NH_3 (D) H_2S
11. Which of the following is the best equation representing photosynthesis?
(A) $6\text{O}_2 + \text{H}_2 \xrightarrow{\text{Chlorophyll}} \text{C}_5\text{HO}_{12} + 6\text{O}_2$
(B) $\text{CO}_2 + \text{H}_2\text{O} \longrightarrow \text{CH}_2\text{O} + \text{O}_2$
(C) $6\text{CO}_2 + 12\text{H}_2\text{O} \xrightarrow{\text{Chlorophyll / Light}} \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{H}_2\text{O} + 6\text{O}_2$
(D) $12\text{CO}_2 + 6\text{H}_2\text{O} \xrightarrow{\text{Light / chlorophyll}} \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{H}_2\text{O} + 6\text{O}_2$
12. The plant that feeds & traps on insects is -
(A) Drosera (B) Sunflower
(C) Cuscuta (D) Mango
13. The green pigment in the leaves is called -
(A) Chlorophyll (B) Anthocyanin
(C) Chloroplast (D) None
14. Which one of the following is a parasite ?
(A) Mushroom (B) Fungi
(C) Dodder (D) Pitcher's plant
15. Rhizobium is a good example of -
(A) Insectivorous (B) Symbiosis
(C) Parasitic (D) None of these
16. Cuscuta is an example of -
(A) Autotroph (B) Parasite
(C) Saprophyte (D) Host
17. Autotrophic nutrition found only in -
(A) Plants (B) Animals
(C) Both (A) & (B) (D) None of these
18. The plant that feeds and traps on insects is -
(A) Venus-fly trap (B) Cuscuta
(C) Sunflower (D) None of these

19. Association of two different organisms in which both are benefited is called -
(A) Symbiosis (B) Nutrition
(C) Saprophytic (D) Parasitic
20. Which of the following is a nutrient ?
(A) Protein (B) Fat
(C) Vitamin (D) All of these
21. Human beings can be categorised as :-
(A) Heterotrophs (B) Autotrophs
(C) Parasites (D) Saprotrophs
22. The food making process in plants is called as :-
(A) Glycolysis (B) Photosynthesis
(C) Photolysis (D) Chemosynthesis
23. Which part of the plant is called its food factory?
(A) Fruits (B) Seeds
(C) Leaves (D) Flowers
24. Green pigment present in the leaves is called.
(A) Haemoglobin (B) Globulin
(C) Albumin (D) Chlorophyll
25. The end products of photosynthesis are.
(A) Carbohydrates, oxygen
(B) Carbohydrates, hydrogen
(C) Carbohydrates, water vapours
(D) Carbohydrates, oxygen, water vapours

ASSERTION & REASON TYPE

Directions :

- (A) Both A and R are true and R is the correct explanation of A.
 - (B) Both A and R are true but R is not the correct explanation of A.
 - (C) A is true but R is false.
 - (D) A is false but R is true.
1. **Assertion :** All plants are not autotrophic.
Reason : Insectivorous plant cannot synthesise their own food.

2. **Assertion :** Lichens are symbiotic association of algae and fungi.
Reason : In symbiosis algae helping photosynthesis and fungi provides water.
3. **Assertion :** Amarbel is example of parasite.
Reason : Pitcher plant is insectivorous plant.

PASSAGE SINGLE CHOICE QUESTIONS

01. The process by which green plants can prepare their own food is called photosynthesis. Green plants possess chlorophyll in their leaf and utilise carbon dioxide (from air) water, minerals (from soil, through root) as raw material and sunlight as source of energy and convert light energy into chemical energy. The food thus synthesised is in the form of starch (carbohydrate).
1. The process by which green plants can prepare their own food is called :
(A) Photosynthesis (B) Chemosynthesis
(C) Autotrophs (D) Heterotrophs
2. Green plants possess _____ in their leaf.
(A) Magnesium (B) Chlorophyll
(C) Potassium (D) Phosphorous
3. What is final product of photosynthesis.
(A) Glucose (B) Carbohydrates
(B) Starch (D) Both (A) & (B)
02. Leguminous plants provide food and shelter to the bacteria as Rhizobium cannot prepare its food. They, thus have a symbiotic relationship. This association is very important for the farmers, as they do not need to add nitrogen fertilisers to the soil in which leguminous plants are grown.
1. Which element is required in crops to make proteins.
(A) Oxygen (B) Nitrogen
(C) Carbon dioxide (D) Zinc

2. _____ bacteria live in the roots of leguminous plants.

- (A) Rhizobium (B) Cyanobacteria
(C) Nostac (D) Spirullina

3. Which kind of plant provides food to Rhizobium bacteria.

- (A) Leguminous (B) Photosynthetic
(C) Both (A) & (B) (D) None of these

MATCH THE COLUMN

1. **Column A**

- (i) Amarbel
(ii) Rhizobium
(iii) Mushroom
(iv) Drosera
(v) Green plants

Column B

- (a) Saprophytes
(b) Insectivorous
(c) Autotrophs
(d) Stomata
(e) Symbiosis
(f) Parasite

2. **Column A**

- (i) Chloroplast
(ii) Photosynthesis
(iii) Carnivores
(iv) Frugivorous
(v) Parasite

Column B

- (a) Parrot
(b) Tiger
(c) Chlorophyll
(d) Cuscuta
(e) Stroma and Grana

Space for Notes :

EXERCISE – II

VERY SHORT ANSWER TYPE

1. What is the meaning of autotrophic nutrition ?
2. What is symbiotic relationship ?
3. What are producers ?
4. Which type of nutrition is found in Doddar ?
5. Write down the equation of photo synthesis ?
6. What is the meaning of 'nutrition' ?
7. How do algae & fungi benefit each other ?
8. What are insectivores ?
9. Write down the two examples of Sanguivorous ?
10. What are parasites ?

SHORT ANSWER TYPE

1. What is photosynthesis ?
2. What factors are essential for photosynthesis ?
3. How do plants exchange gases with the atmosphere ?
4. Name the 3 groups of animals on the basis of their eating habits ?
5. Write the meaning of following terms- herbivores, carnivores & omnivores.

LONG ANSWER TYPE

1. How do you show that chlorophyll is necessary for photosynthesis ?
2. Describe symbiotic mode of nutrition with an example.
3. How dodder takes their nutrients from the host?
4. Describe the methods of nutrition in non green plants ?
5. Draw the diagram of chloroplast and describe its parts ?

TRUE / FALSE TYPE

1. The air generally contains fungal spores which germinate under cold and dry conditions.
2. Certain N_2 -fixing bacteria present in soil convert atmospheric nitrogen into soluble nitrogenous compounds.
3. Bean, moong, peas, etc., are the crops which are grown to replenish nitrogen content of the soil.
4. The white cottony mass of fine threads that grows on stale bread, pickles, leather goods etc., is of fungus called mould.
5. Rafflesia has the largest flower and is a partial parasitic plant.

FILL IN THE BLANKS

1. _____ & _____ are insectivorous plants.
2. Green plants use _____, _____ & _____ to make food.
3. Lichen is the mutual combination of _____ & _____.
4. Doddar is an example of _____.
5. Chlorophyll is present in _____ of the plant.

Answer Key

EXERCISE I

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
D	D	C	D	C	C	D	D	A	D	C	A	A	C	B
16	17	18	19	20	21	22	23	24	25					
B	A	A	A	D	A	B	C	D	A					

Assertion & Reason

1. C 2. A 3. B

PSCQ-I

1. A 2. B 3. C

PSCQ-II

1. B 2. A 3. A

MATCH THE COLUMN

1. (i) → (f), (ii) → (d), (iii) → (f), (iv) → (b), (v) → (c)
 2. (i) → (e), (ii) → (c), (iii) → (b), (iv) → (a), (v) → (d)

EXERCISE II

TRUE/FALSE FALSE

1. False 2. True 3. True 4. True 5. False

FILL IN THE BLANKS

1. pitcher plant, venus fly trap 2. CO₂, H₂O, Sunlight
 3. fungi, algae 4. parasitic plant
 5. Leaves

SELF PROGRESS ASSESSMENT FRAMEWORK

(CHAPTER : NUTRITION IN PLANTS)

CONTENT	STATUS	DATE OF COMPLETION	SELF SIGNATURE
Theory			
In-Text Examples			
Solved Examples			
Exercise I			
Exercise II			
Short Note-1			
Revision - 1			
Revision - 2			
Revision - 3			
Remark			

NOTES :

1. In the status, put “completed” only when you have thoroughly worked through this particular section.
2. Always remember to put down the date of completion correctly. It will help you in future at the time of revision.



Space for Notes :

20 horizontal dotted lines for writing notes.



WEATHER, CLIMATE & ADAPTATIONS OF ANIMALS

3

Concepts

Introduction

1. *Climate*

2. *Adaptation*

2.1 *Adaptation in Aquatic Habitat*

2.2 *Amphibious Adaptations*

2.3 *Aerial Adaptations*

2.4 *Terrestrial Adaptations*

3. *Tropical Rainforest Plants*

4. *Environment*

Solved Examples

Exercise – I (SCQ Type)

Exercise – II (Board Pattern Type)

Answer Key



INTRODUCTION

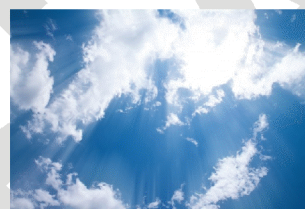
- The day to day condition of the atmosphere at a place with respect to temperature, humidity, rainfall, wind speed etc. is called the weather at that place. The temperature, humidity, rainfall, wind speed etc. are called the elements of the weather. The weather at a place changes every day. Sometimes it is more warm, more humid, more cloudy or more windy. Sometimes it is less warm, less humid, less cloudy or less windy. The weather is generally not the same on any two days and week after week.
- The maximum temperature of the day occurs generally in the afternoon while the minimum temperature occurs in the early morning.
- All changes in the weather are caused by the sun. The sun is a huge sphere of hot gases at a very high temperature. The distance of the sun from us is very large. Even then the energy sent out by the sun is so huge that it is the source of all heat and light on the earth. So, the sun is the primary source of energy that causes changes in the weather.



Windy



Rainy



Cloudy



Sunny

Figure : Changes in weather

1. CLIMATE

- The average weather pattern taken over a long period of time (about 25 years) is called the climate of the place. If the temperature of a place is hot for most of the days and If there is more rainfall, then we say that the climate of the place is hot and wet eg - Kerala. If the temperature at a place is hot for most of the days and if there is less rainfall, then we say that the climate of the place is hot and dry. eg. - Rajasthan.
- The average weather pattern taken over a long time, is called the climate of the place. The tropical and the polar regions are the two regions of the earth, which have severe climatic conditions.
- Temperature and rainfall are two most important factors which effect the climate of an area.
- Micro climate represents the climatic conditions which are present at local scale.
- Macro climate represents the climatic conditions which are present at large scale. Forest is an example of macro climate.

2. ADAPTATION

- Adaptations may be defined as the characteristics of living forms to develop, over a period of time certain morphological, anatomical, physiological, and ecological features which enable them to survive and reproduce within the limits of a particular environment. E.g. fish, whales, aquatic plants are adapted to live in water, birds and bats in air and cacti, insects, camels in deserts.
- Animals are adapted to the conditions in which they live.

2.1 ADAPTATION IN AQUATIC HABITAT

- There are different types of aquatic adaptation present in aquatic plants and animals.

→ IN ANIMALS

- Animals that live in water are called aquatic animals.
- They have a streamlined body that makes it easier for them to move in water.
- They have gills for breathing in water. Fins and the tail help them to swim,
- The scales on their body provide protection.
- Bony fishes have air spaces in their bodies to help them float. Common aquatic animals are fishes, whales, crabs, octopus, etc.
- Certain aquatic fly and beetle larva have a novel adaptation which allows them to take unusual advantage of this. A sharp appendage on the end of their abdomen is used to pierce into submerged plants, giving them access to the internal air-filled cavities as their own personal oxygen source.



Figure : Rainbow trout

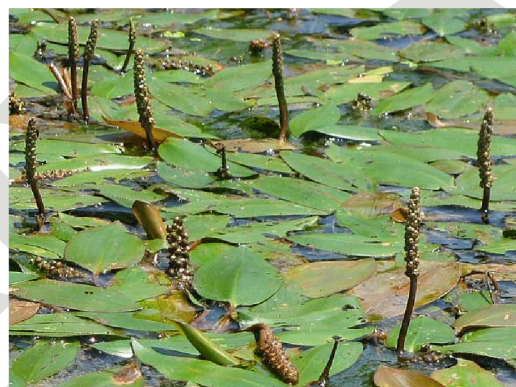
→ IN PLANTS

- Submerged plants lack the external protective tissues required by land plants to limit water loss. The epidermal (outermost) layer shows very little sign of cuticle formation. All the surface cells appear to be able to absorb water, nutrients and dissolved gases directly from the surrounding water. As a result, the internal system of tubes (xylem) which normally transports water from the roots to all parts of the plant is often greatly reduced, if not absent. There are also no stomata (breathing pores) on the leaves.
- Roots, which normally play a very important role in the absorption of nutrients and water from soil, are often also reduced and their main function is anchorage. The root hairs which function in absorption are often absent.

- (c) Many species have very specialised leaf shapes. The submerged leaves are often highly dissected or divided. This has the advantage of creating a very large surface area for absorption and photosynthesis. It also minimises water resistance and hence potential damage to the leaves.
- (d) Heterophylly where leaves of different shapes are produced depending on where they are growing, in many cases, the submerged leaves are totally different to floating or emergent leaves on the same plant. The emergent leaves are usually much less divided, if not entire and have a more similar internal structure to those of land plants. Air-filled cavities often extend throughout the leaves and stems of aquatic plants, providing an internal atmosphere.



Hydrilla



Potamogeton

Figure : Submerged Hydrophytes

2.2 AMPHIBIOUS ADAPTATIONS

→ IN ANIMALS:

- (a) Animals which live both on land and water are called amphibious animals.
- (b) These animals have moist and slimy skin, which helps in breathing. They can also breathe through their lungs.
- (c) The feet of these animals serve as paddles for swimming.
- (d) They are cold blooded animals. Frogs, toads and salamanders are examples of amphibians. These organisms show hibernation i.e. deep long winter sleep to escape from harsh cold condition.



Figure : Frog

2.3 AERIAL ADAPTATIONS

- Aerial animals are adapted for the aerial mode of life. They have a streamlined body covered with feathers.
- Forelimbs are modified into wings. Chest muscle are well developed for fly.
- The bones are light, hollow, spongy and contain many air cavities.
- They have lungs for breathing. Nervous system and sense organs are well developed. Examples: bat, eagle, sparrow, penguin.



Figure : Sparrow

2.4 TERRESTRIAL ADAPTATIONS

- Plants and animals that live on land are called terrestrial plants and terrestrial animals respectively.
- Terrestrial plants are usually divided into root, stem and leaves and well adapted for water absorption & photosynthesis.
- While terrestrial animals have lungs for breathing. The body is covered with scales or hairs. They have a well developed nervous system with sense organs for responding to the various environmental changes. Examples : dog, cat, horse, deer etc.

ADAPTATION IN DESERT:

→ IN ANIMALS

- Deserts are areas that receive very little rainfall. Sahara, Kalahari and Thar are some examples. Though deserts are mostly considered to be hot but some are very cold (e.g. The Gobi desert in China). Organisms such as cactus, camel, rattlesnake, Gila monster and kangaroo rat are found in deserts.



Figure : Camel

- Desert is a water deplete area so basically plants and animals are adapted for little less of water.
- To stay away from the intense heat during the day, rats and snakes stay in burrows deep in the sand. They come out only during the night, when it is cooler.

→ **IN PLANTS**

- (a) Desert plants lose very little amount of water through transpiration.
- (b) Desert plants either have no leaves or they have small or spine shaped leaves to reduce transpiration.
- (c) Photosynthesis is usually carried out by stems.
- (d) The stem is covered with a thick waxy layer which helps it to retain water.
- (e) They have deep roots for absorbing water.

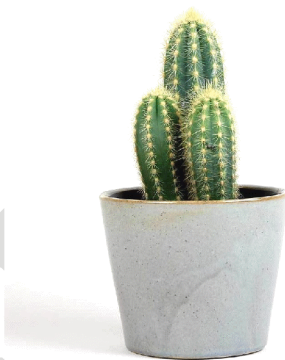


Figure : Cactus

POLAR REGIONS ADAPTATION

- Polar regions are characterized by heavy and snowy winters,
- The Polar Regions are very cold for most parts of the year and the temperatures as low as -37°C . For six months the sun does not rise and for six months the sun does not set. Some of the animals found in the Polar Regions are polar bear, penguins, musk oxen, reindeers, foxes, seals, whales, Siberian crane etc.

→ **IN ANIMALS :** The animals seen here are white or light in colour. This enables them to match the colour of the background (camouflage) and also to regulate the temperature of the body (thermal regulation).

- **Polar bear :**

- (a) They have white fur so that they are not easily visible in the snow and helps in catching their prey.
- (b) They have two layers of fur to protect them from extreme cold.
- (c) They have a layer of fat under the skin which also protect them from cold.
- (d) Their paws are wide and large which help them to walk on snow and to swim in water.
- (v) They have a strong sense of smell which helps them to catch their prey.

- **Penguins**

- They have white coloured body so that they are not easily visible in the snow.
- They have thick skin and a lot of fat to protect them from cold.
- They cuddle together to keep them warm.
- They have streamlined body and webbed feet which help them to swim in water
- They have brood pouches for incubation of egg.



Polar bear



Penguins

Figure : Polar Regions Adaptions

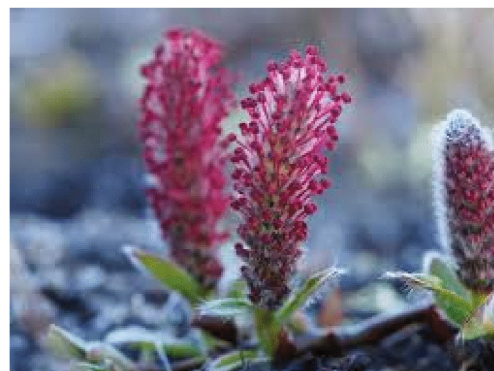
→ **IN PLANTS :**

- Most of the plants are small, they grow close together and close to the ground. This protects them from the cold temperatures and the strong winds. fuzzy coverings on the stems, leaves and buds to provide protection from the wind. Some have woolly seed covers. Some plants have cup-shaped flowers that face up to the sun, so the sun's rays are directed to it. For certain plants only the top layer of soil thaws out so plants have shallow roots.

Eg. Arctic Grass, Arctic Willow, Arctic Poppy



Arctic grass



Arctic willow

Figure : Polar region plants



Focus Point

- **Adaptations of the elephant :-** The elephant has a long trunk which it uses as nose and for picking up food. It has a strong sense of smell. The tusks are modified teeth which helps it to tear barks of trees to eat. Its large ears help it to hear even soft sounds. It also helps it to cool itself in hot climate.



Figure : Elephant

3. TROPICAL RAINFOREST PLANTS

- (a) Plants in tropical rainforests receive 12 hours of sunlight daily, less than 2% of that sunlight reaches the ground. The tropical rainforest has dense vegetation often form three different layers--the canopy, the understory, and the ground layer. Frequently, people think of the tropical rainforest as a "jungle" where plant growth is dense even at ground level. However, the canopy created by the tall trees (100-120 feet) and the understory, prevents sunlight from reaching the ground.
- (b) The soil is always shaded and very little vegetation is able to survive at ground level. Vegetation can become dense at ground level near riverbanks and on hillsides. Hillsides have more plant growth because the angle of the growing surface allows sunlight to reach lower layers of the forest. Riverbeds break up the forest canopy so that smaller plants can get the needed sunlight.

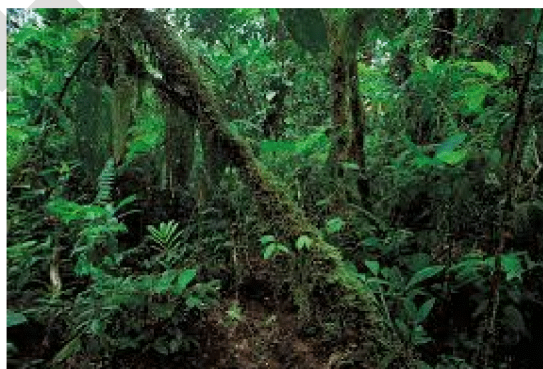


Figure : Tropical rain forest



BUILD THE CONCEPT

- Plant survival in tropical rainforest depends on the plant's ability to tolerate constant shade or to adapt strategies to reach sunlight. Competition for sunlight by plants is sometimes deadly. The strangler fig needs sunlight to grow and reproduce. Seeds falling to the ground quickly die in the deep shade and infertile soil of the tropical rainforest.

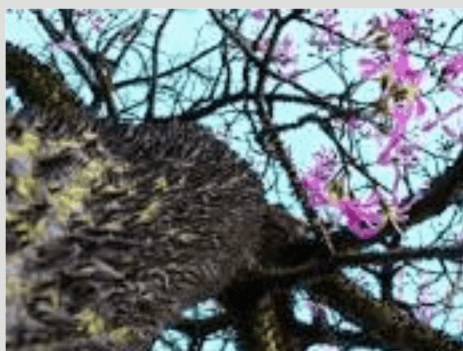


Figure : Epiphytes

4. ENVIRONMENT

- It is the sum total of biotic and abiotic components, substances and conditions that surround & influence the organisms. The various components of environment are interlinked as well as interdependent. The place where an organism is found is called habitat. Organisms are influenced by specific habitat.

COMPONENTS OF ENVIRONMENT

It consists of 2 major components:

(a) Non living Components :

Non living components are also called as abiotic components

- | | |
|-------------------|------------|
| (i) Climate | (ii) Light |
| (iii) Temperature | (iv) Water |
| (v) Soil | |

(b) Biotic or Living Components :

The living components consist of three types of organisms

- (i) **Producers:** Organisms which can prepare their own food from simple inorganic substances like CO_2 and H_2O in presence of sunlight, e.g. Green plants, photosynthetic algae, photosynthetic bacteria etc.
- (ii) **Consumers :** Those organisms which consume food prepared by producers are called as consumers.
Consumers can be of three types :
- **Herbivores :** Which eat only plants and their products. Also called as primary consumers.
 - **Carnivores:** Which eat only other animals also called as secondary consumers.
 - **Omnivores:** Which eat both producer (plants) & consumers (animals).
- (iii) **Decomposers:** The organisms which breakdown the complex organic compounds present in dead organisms (plants and animals) e.g. fungi, bacteria etc.



Focus Point

♦ **Characteristics of living beings.**

- All the living beings can do respiration.
- They need food to do their life process, e.g. Plants can synthesize their food by photosynthesis while animals are directly or indirectly depend on plants for nutrition.
- They can do growth.
- They can respond to stimuli (any change in environment which affect them.)
- They can do excretion.
- They can do reproduction.
- They can do movement.

SOLVED EXAMPLES

SE. 1

Complete the following table:

S.No.	Adaptation	Name of the animal	Region (Tropical rainforest/Polar)	Reason for the adaptation
1.	White fur			
2.	Densely packed feathers			
3.	Long trunk			
4.	Prehensile tail			

Ans.

S.No.	Adaptation	Name of the animal	Region (Tropical rainforest/Polar)	Reason for the adaptation
1.	White fur	Polar bear	Polar region	To camouflage with the snow background
2.	Densely packed feathers	Penguin	Polar region	To provide insulation against cold
3.	Long trunk	Elephant	Tropical rainforest	For strong sense of smell, for picking up the food
4.	Prehensile tail	Monkey	Tropical rainforest	To grasp the tree branches

SE. 2

Different places in the world have different types of climate. Enlist the factors that determine the climate of a place.

Ans. The different factors that determine the climate of a place are:

(i) Latitude (distance from the equator) : Earth has been divided into different climatic zones on the basis of latitude. As we move away from equator, temperature falls. Thus the places near the equator are hotter than the places away from it.

(ii) Altitude (height above the sea level) : As we go higher up from sea level, the temperature falls. Due to this, hilly areas are colder than plains.

(iii) Distance from the sea : If a place is near the sea, the climate is moderate (the weather is uniform throughout the year), but as we move further from the sea, the climate of the place becomes extreme (hot during summer and cold during winter).

(iv) Humidity (amount of water vapour present in air) : Humidity affects rainfall and hence has a strong influence on climate of a place.

(v) Winds : The climate of a place depends on whether the winds are cold, hot, humid or dry. Winds are also responsible for bringing rain.

(vi) Human activities: Human activities also affect the climate of a place.

SE. 3

How do the penguins adapt themselves to survive in extreme cold conditions of regions?

Ans. Various adaptations shown by penguins to survive in extreme cold conditions are:

- (i) Thick layer of subcutaneous fat, thick skin and a dense feather cover provide insulation against cold.
- (ii) Penguins live in groups and get huddled together to keep themselves warm.
- (iii) Streamlined body, paddle-like webbed feet and wings shaped like flippers help them to swim through water at a great speed.

- (iv) Heavy and solid bones make them heavier, so they cannot fly, but dive under water for food,
- (v) Penguins possess short, thick and waterproof feathers which protect them from cold water.

SE. 4

Name one animal that lives on trees in rainforests and rarely comes down. What kind of food does it feed on?

Ans. Lion-tailed macaque (Beard ape) lives on the trees in rainforests. Since it is able to get sufficient food on the trees, it rarely comes down on the ground. It is a good climber and feeds mainly on fruits. It also eats seeds, young leaves, stems, flowers, buds and insects from under the bark of trees.

SE. 5

What do you understand by the term migration? Give an example of a migratory bird which has been killed in large numbers during its migratory flight.

Ans. The seasonal movement of the complete population of animals from one area to another is termed as migration. It is usually a response to the changes in temperature, food supply, or the amount of day light, and is usually undertaken for the purpose of breeding. Siberian crane is a migratory bird which has been killed in larger numbers during its migratory flight.

SE. 6

List three adaptations shown by animals living in polar regions to prevent heat loss from the body. Give example in each case.

Ans. 1. Presence of subcutaneous fat and thick layer of fur or feathers on the body acts as an insulating coat and prevents heat loss from the body.

Examples : polar bear, penguin.

2. Mammals living in colder climates generally have shorter ears and limbs. This helps them to retain body heat e.g. polar bears have very short ears.
3. Another way to reduce heat loss is to reduce body activity. Some animals e.g. polar bears undergo hibernation i.e. winter sleep during which they minimise their metabolic rate.

SE. 7

Give reasons for the following:

- (a) Polar bear has large paws with long, curved and sharp claws
- (b) Siberian cranes visit Asian countries during extreme winter seasons
- (c) Elephants in tropical rainforests possess large ears

Ans. (a) Polar bear has wide and large paws having long, curved and sharp claws. These features help the animal to walk on ice with ease, and to swim well in water. The sharp, curved claws also help the polar bear in digging the snow, holding the prey and for self defence.

(b) Siberian cranes undergo migration from Siberia to India to escape the extreme cold conditions and shortage of food supply during winter season.

(c) Elephants have large ears due to which they have a keen sense of hearing. The large ears also help them to lose heat from the body and to keep them cool in the hot and humid climate of the rainforest.

SE. 8

How does the sun affect climate of a particular region?

Ans. The angle at which sun's rays strike the surface of earth is a major factor that determines the climate of a particular place. Near the equator, sun rays fall vertically. This results in more heating of the areas near the equator than the areas away from it, in a given time. As the distance from the equator (i.e. latitude) increases, the rays become more and more slanting. Slanting rays spread over a larger area than vertical rays. Also, they pass through a thicker layer of the atmosphere which absorbs a large part of their heat and so these areas are less hot. In this way, sun has a direct effect on the climate of a particular place.

SE. 9

Mention the two ways by which fur of a polar bear helps it to adapt to its surroundings.

Ans. 1. White fur of a polar bear camouflages it with the white snowy background so that it can not be easily seen. This protects the polar bear against predators and also helps it to catch its prey.

2. The dense, fine fur of polar bear traps air and thus acts as an insulating coat to keep the bear warm.

SE. 10

Read the following statements with 1-2 blanks in each one of them. Fill in the blanks with appropriate words.

(a) The average weather pattern of a place taken over a long time, say 25 years, is called the _____ of that place.

(b) Scientists who study and predict weather are known as _____.

(c) In India, rain is mainly brought by two kinds of humidity laden winds these are the _____ monsoon which brings heavy rain to most parts of the country, and the _____ monsoon which brings relatively lighter rain.

(d) In most parts of Rajasthan, it is hot for most parts of the year, with very little rainfall thus the climate of Rajasthan is said to be _____.

Ans. (a) climate
(b) meteorologists
(c) southwest, northeast
(d) hot and dry

SE. 11

The weather data in a week has been summarised below:

Day	Maximum Temperature	Minimum Temperature	Weather
Sunday	35°C	25°C	Sunny and hot
Monday	33°C	22°C	Sunny
Tuesday	29°C	20°C	Dry and Cloudy
Wednesday	31°C	21°C	Cloudy
Thursday	26°C	16°C	Rainy
Friday	29°C	20°C	Light showers
Saturday	31°C	21°C	Cloudy

(a) Which day has the highest temperature?
(b) Which day has the least temperature?
(c) Sonal wants to play in the rain with paper boats. On which day she would be able to fulfil her wish?
(d) On which day will the clothes dry faster?

- Ans.** (a) Sunday has the maximum temperature of about 35°C.
- (b) Thursday has the least temperature of about 16°C.
- (c) On thursday, the weather is rainy. Hence, Sonal can play on this day with paper boats.
- (d) On Sunday, weather is sunny and hot. Hence, on Sunday, clothes with dry faster.

SE. 12

Indicate the type of climate in following areas :

- (a) Darjeeling _____
- (b) Chennai _____
- (c) Bikaner _____
- (d) Kerala _____

- Ans.** (a) Darjeeling – Cold
- (b) Chennai – Warm and humid
- (c) Bikaner – Hot and dry
- (d) Kerala – Hot and wet

Space for Notes :

EXERCISE – I

ONLY ONE CORRECT TYPE

1. The characteristic weather pattern over a long period of time is called -
(A) Weather (B) Climate
(C) Season (D) Atmosphere
2. The climate of a place depends on its –
(A) Latitude
(B) Altitude
(C) Distance from the sea
(D) All of these
3. The cause for the occurrence of seasons on the earth is
(A) The inclination of the earth's axis with the plane of its orbit
(B) Its distance from the sun
(C) Latitude
(D) All of these
4. 'Albedo' refers to
(A) The carbon dioxide content of the atmosphere
(B) The constitution of the atmosphere
(C) The percentage of radiation reflected by a planet
(D) The temperature differences on a planet
5. Camels adapt to the desert climate with the help of
(A) Long eyelashes
(B) Hump
(C) Body temperature changes
(D) All of these
6. The hump of the camel is a reservoir of –
(A) Fatty tissue (B) Water
(C) Milk (D) All of these
7. Which of these animals possesses blubber under its skin?
(A) Camel (B) African elephant
(C) Fennec (D) Polar bear
8. During extreme aridity, Desert rat
(A) Stores water
(B) Uses metabolic water
(C) Saves water
(D) Does not use water
9. Which trait is not helpful to a fish in adaptation?
(A) Streamlined body
(B) Large pupils of the eyes
(C) Gills
(D) Beautiful colour of the body
10. Hibernation, migration of suitable places and insulation of the body by fur or feathers are characteristics of
(A) Polar animals
(B) Animals of temperate regions
(C) Animals of tropical regions
(D) Animals of equatorial regions
11. The organism that lives on land but requires aquatic habitat to lay eggs is -
(A) Frog (B) Camel
(C) Hydra (D) Snake
12. Camel is best adapted to desert habitat as
(A) It can drink 50 liters of water at a time which is evenly distributed in all its tissues
(B) It excretes very small amount of water during urination
(C) It can regulate its body temperature at a wider range
(D) All are correct
13. Change in colour of some organisms according to the background, to protect themselves is called
(A) Mimicry (B) Moulting
(C) Camouflage (D) None of these

14. In aerial animals the forelimbs are modified into-
(A) Wings (B) Hind limbs
(C) Body (D) Air chambers
15. Which features adapt polar bears to live in extremely cold climate?
(A) A white fur, fat below skin, keen sense of smell
(B) Thin skin, large eyes, a white fur
(C) A long tail, strong claws, white large paws
(D) White body, paws for swimming, gills for respiration
16. Xeric environment is characterised by
(A) Precipitation
(B) Low atmospheric humidity
(C) Extremes of temperature
(D) High rate of vapourisation
17. Hibernation occurring in certain animals is
(A) Occasional (B) Intermittent
(C) Rhythmic (D) Periodic
18. Seasons occur due to the earth's _____ to the plane of its orbit around the sun
(A) Movement (B) Tilt
(C) Axis (D) Surface
19. The percentage of radiation reflected by a planet is called
(A) Albedo (B) Albedo
(C) Albedo (D) Climatic
20. The study of the climate over thousands of years is called
(A) Ecology
(B) Dendroclimatology
(C) Weather forecasting
(D) Paleoclimatology
21. Animals have certain special characteristics that enable them to live in a particular climate successfully, which are called -
(A) Adaptations (B) Adoptions
(C) Habit (D) Albedo
22. In dry and hot climates, animals need modifications to _____ water.
(A) Evaporate (B) Conserve
(C) Waste (D) Absorb
23. Some animals in extremely hot climates go off to a state of dormancy called _____ during the summer season.
(A) Hibernation (B) Blubber
(C) Aestivation (D) Acclimatization
24. Fungi and bacteria is example of-
(A) Decomposers (B) Herbivores
(C) Carnivores (D) Omnivores
25. Select the odd one out :-
(A) Climate (B) Light
(C) Water (D) Plants

ASSERTION & REASON TYPE

- (A) Both A and R are true and R is the correct explanation of A.
(B) Both A and R are true but R is not the correct explanation of A.
(C) A is true but R is false.
(D) A is false but R is true.

- Assertion :** Penguins are good swimmers.
Reason : Penguins have webbed feet and streamlined body.
- Assertion :** A leaf insect looks like leaves and polar bear has white fur.
Reason : They use their bodies to attack enemies.
- Assertion :** The lion tailed macaques lies in deserts.
Reason : Macaques are good climbers.

PASSAGE SINGLE CHOICE QUESTIONS

01. The tropical region has generally a hot climate because of its location around the equator. Even in the coldest month, the temperature is generally higher than about 15°C. Tropical rainforests are found in Western Ghats and Assam in India, Southeast Asia, Central America and Central Africa. Red-eyed frog has developed sticky pads on its feet to help it climb trees on which it lives.

1. Tropical region has which _____ kind of climate.

- (A) Hot (B) Cold
(C) Snow fall (D) Rainy

2. Tropical rainforests are found in.

- (A) Western Shats (B) Assam
(C) Southeast Aisa (D) All of these

3. Which animal develops sticky pads on its feet.

- (A) Monkey (B) Tigers
(C) Red-eyed frog (D) Apes

02. Migration is physical movement of birds or animals from one area to another for food, space, breeding, escaping harsh condition, etc. Migration is commoly seen in birds living in extreme cold climate to lomng distances for warmer palces during the winter season. Siberian crane and Arctic tern are some of the migratory birds.

1. Physical movement of animals for food and shelter is known as :

- (A) Migration (B) Evolution
(C) Locomotion (D) Both (A) & (B)

2. Siberian Bird migrates to India during.

- (A) Summer (B) Winter
(C) Rainy (D) None of these

3. Which national park is famous for siberain Bird.

- (A) Keoladeo National Park
(B) Kanha National Park
(C) Betla National Park
(D) Gir National Park

MATCH THE COLUMN TYPE

1. Column-A

(i) Frog

(ii) Camel

(iii) Siberian

(iv) Polar bear

(v) Elephant

Column-B

(a) Keep moving big ears to keep body cool

(b) Cold blooded animals

(c) Ship of desert

(d) migration

(e) thick coat of white fur.

2. Column-A

(i) Abiotic

(ii) Polar Region

(iii) Transpiration

(iv) Tropical rainforest

(v) Biotic

Column-B

(a) Human

(b) Cactus

(c) Monkey

(d) Climate

(e) Penguin

EXERCISE – II

VERY SHORT ANSWER TYPE

1. Define adaptation?
2. Name any four terrestrial animals.
3. Why do birds migrate?
4. How has the red-eyed frog adapted to the tropical rainforests?
5. What adaptation helps the tiger in catching the prey?
6. What is weather ?
7. What is omnivores ?
8. Write two examples of adaption in desert ?
9. What is climate ?
10. What is environment ?

SHORT ANSWER TYPE

1. What is the difference between climate and weathers? Which of these two changes frequently?
2. Explain the aquatic adaptation.
3. Explain with examples why we find animals of certain kind living in particular climatic conditions.
4. Explain the aquatic adaptation.
5. Which features adapt polar bear to live in extremely cold climate?

LONG ANSWER TYPE

1. Explain how sun affects weather & climate of a region.
2. Explain how polar bear is adapted to its climate.
3. Explain the adaptation of the Indian elephant to its climate.

4. Explain:-
 - (i) Aquatic Adaptations
 - (ii) Terrestrial Adaptations
 - (iii) Amphibious Adaptations
5. What is environment and its components ?

TRUE / FALSE TYPE

1. Plant body is also covered by mucus layer to reduce friction and having inactive stomata in submerged plant.
2. Weather can vary over very short period time.
3. All the changes are driven by moon.
4. Lion tailed macaque feeds mainly fruits.
5. Penguin is example of amphibious adaptations.

FILL IN THE BLANKS

1. Fur keeps an animal warm by trapping_____.
2. Many birds living in polar regions _____ to warmer regions in winters.
3. Camel's skin does not possess _____ glands.
4. Animals that become active at night are called as _____ animals.
5. The animals which eat other animals is called as _____.

Answer Key

EXERCISE-I

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B	D	A	C	D	A	D	B	D	A	A	D	C	A	A
16	17	18	19	20	21	22	23	24	25					
C	D	A	C	D	A	B	C	A	B					

ASSERTION & REASON

1. A 2. C 3. D

PSCQ-I

1. A 2. D 3. C

PSCQ-II

1. A 2. B 3. A

MATCH THE COLUMN TYPE

1. (i) → (b), (ii) → (c), (iii) → (d), (iv) → (e), (v) → (a).
 2. (i) → (d), (ii) → (e), (iii) → (b), (iv) → (c), (v) → (a).

EXERCISE II

TRUE/FALSE TYPE

1. True 2. True 3. False 4. True 5. False

FILL IN THE BLANKS TYPE

1. Heat 2. Hibernation 3. Sweat 4. Nocturnal 5. Carnivores

SELF PROGRESS ASSESSMENT FRAMEWORK

(CHAPTER : WEATHER, CLIMATE & ADAPTATIONS OF ANIMALS)

CONTENT	STATUS	DATE OF COMPLETION	SELF SIGNATURE
Theory			
In-Text Examples			
Solved Examples			
Exercise I			
Exercise II			
Short Note-1			
Revision - 1			
Revision - 2			
Revision - 3			
Remark			

NOTES :

1. In the status, put “completed” only when you have thoroughly worked through this particular section.
2. Always remember to put down the date of completion correctly. It will help you in future at the time of revision.



Space for Notes :

Handwriting practice lines consisting of 20 horizontal dotted lines.





JEE Division | NEET Division

📍 Piprali Road, Sikar, Rajasthan 332001 | 📞 01572-241911, 01572-243911



MATRIX HIGH SCHOOL
Pre-foundation & Schooling Division

📍 Piprali Road, Sikar, (Raj.) 332001 | Bikaner Bypass Road, Near Gokulpura Village, Sikar (Raj.) 332021 | 📞 01572-242911

Scan QR to Register



Visit us www.mof.matrixedu.in

📱 @matrixsikir 📺 @matrix_sikar 🐦 @MatrixSikar 📺 /c/matrixacademy