Lesson 2. Nutrition in Animals.

Grade : VII

Basic concepts – A Flow Chart

Nutrition in Animals

Classification Based on Eating Habits

Herbivorous

- Animals that obtain their food only from plants.
- Example: cow, sheep, Goat, deer, elephant, Kangaroo, giraffe, etc.

Carnivorous

- Animals that obtain their food by killing other animals.
- They never eat plants.
- Example: Tiger, lizard, lion, etc.

Omnivorous

- Animlas that consume plats as well as other animals as their food.
- Example : bear, dog, human beings, etc.

Parasites

- Organisms that obtain their food from other animals either by living inside (**endoparasites)** or outside (**Ectoparasites)** their body.
- Example: tapeworm and roundworm (inside body), tick and lice (outside body).

Scavengers

- Animals which feed on the remains of dead animals preyed by predators.
- Example: Vulture, crows, jackal etc.

Utilisation/Digestion in Body

Digestion is the breakdown of complex components of food into simpler substances.

In Humans

The food passes through the following parts

- Mouth and Buccal Cavity : Food is ingested and chewed with teeth; tongue mixes saliva with food and help in swallowing.
- **Food Pipe/Oesophagus**: Food moves downwards to the stomach.
- **Stomach:** inner lining secretes mucous, hydrochloric acid and digestive juices which break down proteins into simpler forms.
- **Small intestine.** Receives secretions from liver, pancreas and its own wall; pancreatic juice breaks down carbohydrates into glucose and proteins into amino acids, bile juice breaks down fats into fatty acids and glycerol; inner walls have villi which absorb digested food and pass it into blood vessels,
- **Large intestine:** Absorb water and some salts from undigested food material and rest is egested through rectum.

In Grass- eating Animals

- Plant is chewed and swallowed into first compartment of stomach (rumen) where food is partly digested.
- Food is then passed to reticulum where it forms cud.
- It then passes through abomasums, duodenum and small intestine for complete digestion and absorption.

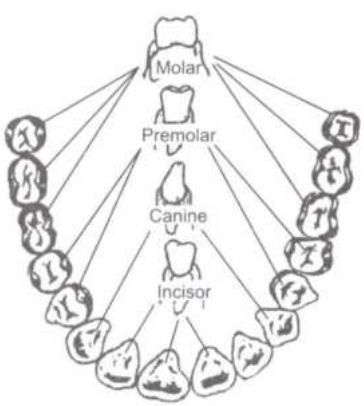
In Amoeba

- It pushes out finger-like pseudopodia which engulf the prey.
- Lysosome secretes digestive enzymes in the food vacuole.
- Prey is digested and the indigested material is expelled outside by the vacuole.

Know the Terms

- **Buccal cavity** : The cavity of mouth, with all its internal parts like cheeks, teeth, tongue and salivary glands to called buccal cavity.
- **Cellulose** : A type of carbohydrate. Many animals including human cannot digest cellulose.
- **Glycerol** : It is one of the constituent of fat. It combines with fatty acid to from fats.
- **Fatty Acids** : One of the main constituent of fats.
- **Ingestion** : Process of taking food into the body.
- **Digestion** : The breakdown of complex components of food (which cannot be utilised by our body) into simpler and absorbable substances is called digestion.
- **Absorption** : The passage of digested food into the blood vessels is called absorption of food. This process takes place in the small intestine in case of human beings.
- **Assimilation** : The process in which the absorbed food is used for producing energy and growth is called assimilation.
- **Egestion** : The removal of undigested and unabsorbed food material, called faecal matter through the anus from time to time is called egestion .

Arrangements of different types of teeth :



Types of teeth with functions:

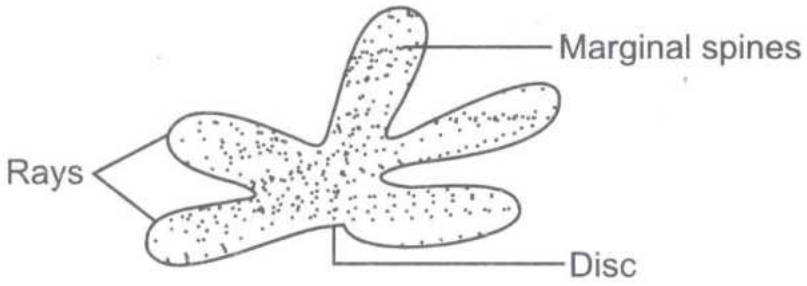
Types of Teeth	Number in each half of the jaw	Structure	Function
Incisors (Front teeth)	1	Have flat, sharp edges	Cutting and biting the food.
Canines	2	Sharp and conical	Tearing and piercing
Premolars	3	Bicuspids and have one or two roots	Crushing and grinding

Molars	4	Four or five cusps, have more than one root	Crushing, grinding and mastication

Number and types of teeth in man

Types of Teeth	Milk teeth	Permanent teeth
Incisor	**4**	**4**
Canine	**8**	**8**
Premolar	**8**	**8**
Molar	**0**	**12**
Total number of teeth	**20**	**32**

- **Tooth decay** : After eating food, especially sweets, chocolates, cold drink and other sugars, if mouth not washed properly, then some leftover food and sugars remain attached to teeth. The harmful bacteria breakdown the sugars and release acids. The acids gradually damage the teeth. This is called tooth decay which may lead to toothache and even loss of tooth.
- **Amazing fact**: Star fish feeds on animals covered by hard shells of calcium carbonate.



- **ORS (Oral Rehydration Solution)** : It is prepared by dissolving a pinch of salt and sugar in boiled and cooled water. It prevents dehydration of the body due to diarrhoea and vomiting.

Objective Type Questions

(1 Mark each)

I. Multiple choice questions

1. Animals are not

a. Autotrophs b. Parasites c. Saprotrophs d. Holozoic

2. The digestive food is absorbed in

a. Large intestine b. Stomach c. Liver d. Small intestine

3. Saliva converts starch into

a. fats b. Sugar c. Proteins d. Minerals

4. Which one of the following is not secreted by the walls of stomach?

a. Hydrochloric acid b. Mucous c. Digestive juice d. Bile juice

5. The Bile juice is stored in

a. Gall bladder b. Liver c. Pancreas d. Small intestine

6. Which one of the following is not a step of nutrition?

a. Ingestion b. Digestion c. Absorption d. Excretion

7. Given below from (i) to (iv) are some food items. **[NCERT Exemplar]**

i. Boiled and mashed potato

ii. Glucose solution

iii. A slice of bread

iv. Mustard oil

Which of the above will give blue-black colour when tested with iodine?

8. Which of the following pair of teeth differ in structure but are similar in function?

[NCERT Exemplar]

a. Canines and incisors b. Molars and premolars

c. Incisors and molars d. Premolars and canine

9. Read carefully the terms given below. Which of the following set is the correct combination of the following set is the correct combination of organs that do not carry out any digestive functions? **[NCERT Exemplar]**

a. Oesophagus, Large Intestine, Rectum

b. Buccal cavity, Oesophagus, Rectum

c. Buccal cavity, Oesophagus, Large Intestine

d. Small Intestine, large Intestine, rectum

10. The swallowed food moves downwards in the alimentary canal because of. **[NCERT Exemplar]**

a. Force provided by the muscular tongue b. The flow of water taken with the food

c. Gravitational pull d. The contraction of muscles in the wall of food pipe

11. The acid present in the stomach. **[NCERT Exemplar]**

a. Kills the harmful bacteria that may enter along with the food.

b. Protects the stomach lining from harmful substances

c. Digests starch into simpler sugars

d. Makes the medium alkaline

12. The finger-like outgrowths of Amoeba helps to ingest food. However, the finger-like outgrowths of human intestine help to **[NCERT Exemplar]**

a. Digest the fatty food substance b. Make the food soluble

c. Absorb the digested food d. Absorb the undigested food

13. Read the following statements with reference to the villi of small intestine. **[NCERT Exemplar]**

i. They have very thin walls

ii. They have a network of thin and small blood vessels close to the surface.

iii. They have small pores through which food can easily pass

iv. They are finger-like projections

14. The false feet of Amoeba are used for **[NCERT Exemplar]**

a. Movement only b. Capture of food only

c. Capture of food and movement d. Exchange of gases only

15. The enzymes present in the saliva convert. **[NCERT Exemplar]**

a. Fats into fatty acids and glycerol b. Starch into simple sugars

c. Proteins into amino acids d. Complex sugars into simple sugars

16. Cud is the name given to the food of ruminants which is **[NCERT Exemplar]**

a. Swallowed and undigested b. Swallowed and partially digested

c. Properly chewed and partially digested d. Properly chewed and completely digested

17. Choose the correct order of terms that describes the process of nutrition in ruminants. **[NCERT Exemplar]**

a. Swallowing → partial digestion → chewing of cud – complete digestion

b. Chewing of cud → swallowing → partial digestion → complete digestion

c. Chewing of cud → swallowing → mixing with digestive juices → digestion

d. Swallowing → chewing and mixing → partial digestion → complete digestion.

18. Cellulose-rich food substances are good source of roughage in human beings because.

[NCERT Exemplar]

a. Human beings do not have cellulose-digesting enzymes

b. Cellulose gets absorbed in the human blood and converts into fibres

c. The cellulose – digesting bacteria convert cellulose into fibres.

d. Cellulose breaks down into smaller components which are egested as roughage.

1. a	2. d	3. b	4. b	5. a	6. d	7. b	8. b	9. a
10. d	11. a	12. c	13. a	14. c	15. b	16. b	17. a	18. a

II. Multiple choice questions

1. Villi are located in the:

(a) Small intestine (b) Large intestine (c) Stomach (d) None of these

2. Animals are not:

(a) Autotrophs (b) Parasites (c) Saprotrophs (d) Holozoic

3. The digestive food is absorbed in:

(a) Large intestine (b) Stomach (c) Liver (d) Small intestine

4. Ruminants can:

(a) Digest the cellulose (b) Not digest the cellulose

(c) Sometimes digest and sometimes cannot (d) All of these

5. The simplest form of carbohydrates is:

(a) Fatty acids (b) Amino acids (c) Glucose (d) Sugar

1. a	2. a	3. d	4. a	5. c

I. Fill in the blanks

1. Egestion is to _____ the undigested food through anus.

2. Cud chewing animals are called _____ .

3. Four kinds of teethe present in human are _____, _____, _____ and _____ .

4. The digestion of all food components is completed by the _____ juice. **[NCERT Exemplar]**

5. Large intestine absorbs _____ and some _____ from the undigested food. **[NCERT Exemplar]**

6. Tongue is attached at the _____ to the floor of the mouth cavity and is free at the _____. **[NCERT Exemplar]**

7. Amoeba pushes out _____ around the food and traps it in a food _____. **[NCERT Exemplar]**

8. Glucose is the simplest form of _____.

9. Trypsin acts on proteins to convert them in the _____.

10. Animals are _____.

11. The breakdown of complex components of food into simpler substances is called _____.

12. There are _____ types of permanent teeth.

13. Bile juice is secreted by the gland _____.

1. remove	2. ruminants	3. Incisor, Canine, Premolar, Molar
4. Intestinal	5. Water, salts	6. back, front
7. Pseudopodia, vacuole	8. Carbohydrates	9. Aminoacids
10. Heterotrophs	11. Digestion	12. Four
13. Liver		

II. Fill in the blanks

1. The alimentary canal stretches from _____ to _____.

2. Teeth are rooted in separate _____ in between the _____.

3. Digestion of food starts in _____ and gets completed in _____.

4. _____ is the largest gland in the human body.

a. mouth, anus	b. sockets, gums
c. buccal cavity, small intestine	d. liver

III. Fill in the blanks

1. Egestion is to _____ the undigested food through anus.

2. Digestion is the process to break the complex food materials into _____.

3. Source of energy for living organisms is _____.

1. remove	2. simpler form	3. food

I. Match the following

Column I	Column II
a. Saliva	i. Fatty acids
b. Heterotrophs	ii. Ptyalin
c. Fats	iii. Digestion of cellulose
d. Tripsin	iv. Human beings
e. Ruminants	v. Proteins

a. ii	b. iv	c. i	d. v	e. iii

II. Match the following

1. Column A	Column B
a. Bile juice	i. False feet
b. ORS	ii. Digestion of cellulose
c. Fats	iii. Diarrhoea
d. Trypsin	iv. Heterotrophs
e. Pseudopodia	v. Ptyalin
f. Ruminants	vi. Liver
g. Saliva	vii. Fatty acid
h. Animals	viii. Protein

a. vi	b. iii	c. vii	d. viii	e. i	f. ii	g. v	h. iv

2. Column A Animals	Column B Mode of Feeding
a. House fly	i. Biting and chewing
b. Cockroach	ii. Suckling
c. Moquito	iii. Sponging
d. Infants	iv. Sucking

a. vi	b. iii	c. vii	d. viii

3. Column A	Column B
a. Rectum	i. Musous
b. Gall bladder	ii. Villi
c. Stomach	iii. Taste buds
d. Tongue	iv. Faeces
e. Small intestine	v. Bile juice

a. iv	b. v	c. i	d. iii	e. ii

III. Match the following

1. Column I	Column II
a. Salivary gland	i. Bile juice secretion
b. Stomach	ii. Storage of undigested food
c. Liver	iii. Saliva secretion
d. Rectum	iv. Acid release
e. Small intestine	v. Digestion is completed
f. Large intestine	vi. Absorption of water
g. Carbohydrates	vii. Fatty acids and glycerol
h. Proteins	viii. Sugar
i. Fats	ix. Taste buds
j. Tongue	x. Amino acids

a. iii	b. iv	c. i	d. ii	e. v	f. vi	g. viii	h. x	i. vii	j. ix

I. True or False

1. Tongue is attached to the roof of the mouth cavity at the back.
2. The large intestine is larger and wider than the small intestine of the human alimentary canal.
3. Mucus protects the stomach lining from damage.
4. All heterotrophs have a similar basic process of nutrition.

a. False	b. False	c. True	d. True

II. True or False

1. Hydrochloric acid is produced by the lining of stomach walls which is used to kill the bacteria.
2. Oesophagus is also called large intestine.
3. The simplest form of proteins is the glucose.
4. The food is the main source of energy for living organisms.
5. Absorption is the step of nutrition.

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

Quiz Time

1. Name the animal which pops out its stomach through its mouth to eat the soft animal present inside the shell.
2. What is the approximate length of small intestine?
3. How many cutting and biting teeth are present in lower jaw?
4. Which chemical you would select to test the presence of starch in the food item?
5. Why you get hiccups when you talk or laugh while eating?
6. What mode of feeding found in ant?
7. What was the name of the doctor who found the stomach performs churning of food?
8. What is the full form of ORS?
9. In which part of alimentary canal a cow digests cellulose?
10. Which structure of Amoeba help in capturing food?

1. Starfish	2. 7.5 metre
3. 4	4. Iodine solution
5. This happens when food particles enter the windpipe	6. Chewing
7. William Beaumont	8. Oral Rehydration Solution
9. Rumen	10. Pseudopodia

NCERT Corner

Intext Question

1. You have studied in Class VI that food consists of many components. Try to recall and list them.

1. Carbohydrates
2. Proteins
3. Fat
4. Vitamins
5. Minerals
6. Roughage

2. What is the type of food and mode of feeding of the following animals ? Write down your observations in the given table.

(Scraping, chewing, brewing, capturing, swallowing, sucking etc.)

Name of Animal	Kind of food	Mode of Feeding
Snail	lower plants	sucking
Ant	sugar, food particles	scraping
Eagle	lower animals, small birds	capturing and swallowing
Humming-bird	small insects	capturing
Lice	blood	sucking
Mosquito	blood	sucking
Butterfly	nectar	sucking
House fly	sugar	sucking

3. How many kinds of teeth do you find ?

Four.

4. Which teeth do you use for biting and cutting ?

The incisors.

5. Which ones for piercing and tearing ?

Canine.

6. Which one for chewing and grinding ?

Premolars and molars.

7. Record your observations in Table 2.2

Type of teeth	Number of teeth		Total
	Lower jaw	Upper jaw	
Cutting and biting teeth	2	2	4
Piercing and tearing teeth	4	4	8
Chewing and grinding teeth	10	10	20

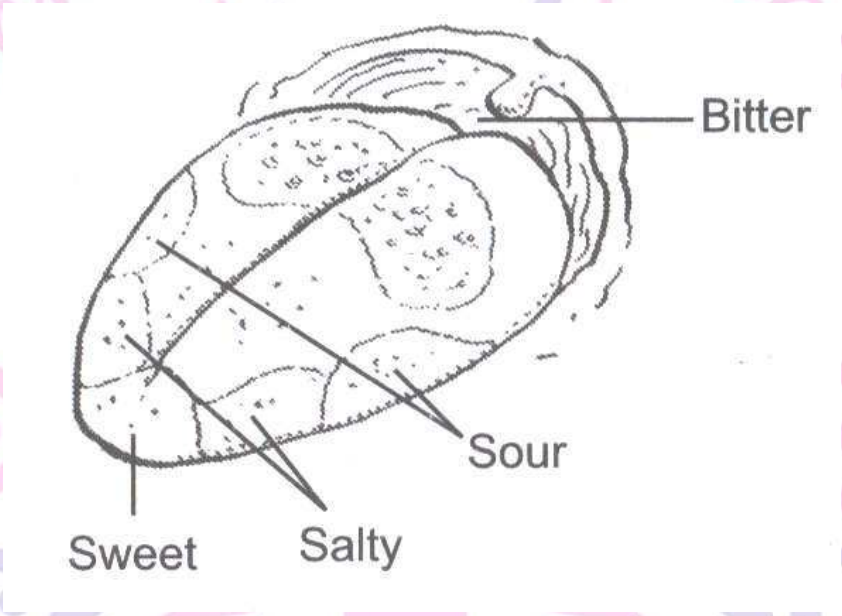
8. Why is there a change in colour in the test tubes ?

Because iodine solution when comes in contact with starch turns blue-black.

9. Do you know the functions of the tongue ?

We use our tongue for talking and taste. Besides, it mixes saliva with the food during chewing and aids in swallowing food. We also taste food with our tongue. It has taste buds that detect different tastes of food.

10. Now write down your observations and label Fig.



11. Can you guess what the role of villi could be in the intestine ?

The villi increase the surface area for absorption of the digested food. Each villus has a network of thin and small blood vessels near to its surface. The surface of the villi absorbs the digested food materials.

12. Paheli wants to know why these animals cannot chew food properly at the time they take it in ?

The ruminants mainly live on grass and bush which always contain cellulose or roughage. For the splitting of cellulose a lot of chewing and saliva, both are necessary. So, the ruminants need to chew the grass for a long time. So, they chew it twice. If they chew for long while eating, they will get less time to eat.

13. Boojho wants to know why we cannot digest cellulose like the cattle do ?

Ruminants have a large sac-like structure known as rumen which is located in between the small intestine and large intestine. The cellulose of the food is digested here by the action of certain bacteria which are not present in humans.

Textbook Question

1. Fill in the blanks :

(a) The main steps of nutrition in humans are _____and_____.

(b) The largest gland in the human body is _____

(c) The stomach releases hydrochloric acid and _____ juices which act on food.

(d) The inner wall of the' small intestine has many finger-like outgrowths called_____.

(e) Amoeba digests its food in the_____.

(a) ingestion, digestion, absorption, assimilation and egestion.

(b) liver,

(c) digestive,

(d) villi,

(e) food vacuole.

2. Mark 'T' if the statement is true and 'F' if it false :

(a) Digestion of starch starts in the stomach. (T / F)

(b) The tongue helps in mixing food with saliva. (T/F)

(c) The gall bladder temporarily stores bile. (T / F)

(d) The remnants bring back swallowed grass into their mouth and chew it for some time. (T / F)

Ans. (a) F, (b) T, (c) T, (d) T.

3. Tick (✓) mark the correct answer in each of the following :

(a) Fat is completely digested in the

(i) stomach (ii) mouth (iii) small intestine (iv) large intestine

(b) Water from the undigested food is absorbed mainly in the

(i) stomach (ii) food pipe (iii) small intestine (iv) large intestine

(a) (iii) small intestine, (b) (iv) large intestine

4. Match the item of Column I with those given in Column II.

Column I Food components	Column II Product(s) of digestion
(a) Carbohydrates	(i) Fatty acids and glycerol
(b) Proteins	(ii) Sugar
(c) Fats	(iii) Amino acids

a. ii	b. iii	c. i

5. What are villi? What is their location and function?

The inner walls of the small intestine have a very large number of finger like outgrowths. These are known as villi which are located in the small intestine. The villi enlarge the surface area for absorption of the digested food. Each villus has a network of thin and small blood vessels close to its surface. The surface of the villi absorbs the digested food stuff.

6. Where is the bile produced? Which components of the food does it help to digest?

Bile is produced by liver and gets stored in gall bladder. Bile juice digests fat.

7. Name the type of carbohydrate that can be digested by ruminants but not by humans. Give the reason also.

Cellulose is a type of carbohydrate which can be digested by ruminants but not by human. Ruminants have a large sac-like structure known as rumen which is present in between the small intestine and large intestine. The cellulose is digested here by the action of certain bacteria which are not present in humans.

8. Why do we get instant energy from glucose?

Glucose is the simplest form of carbohydrate which can be broken down by oxygen, during respiration, easily to give energy. So, glucose is called instant energizer.

9. Which part of the digestive canal is involved in :

(i) absorption of food _____.

(ii) chewing of food _____.

(iii) killing of bacteria _____.

(iv) complete digestion of food _____.

(v) formation of faeces _____.

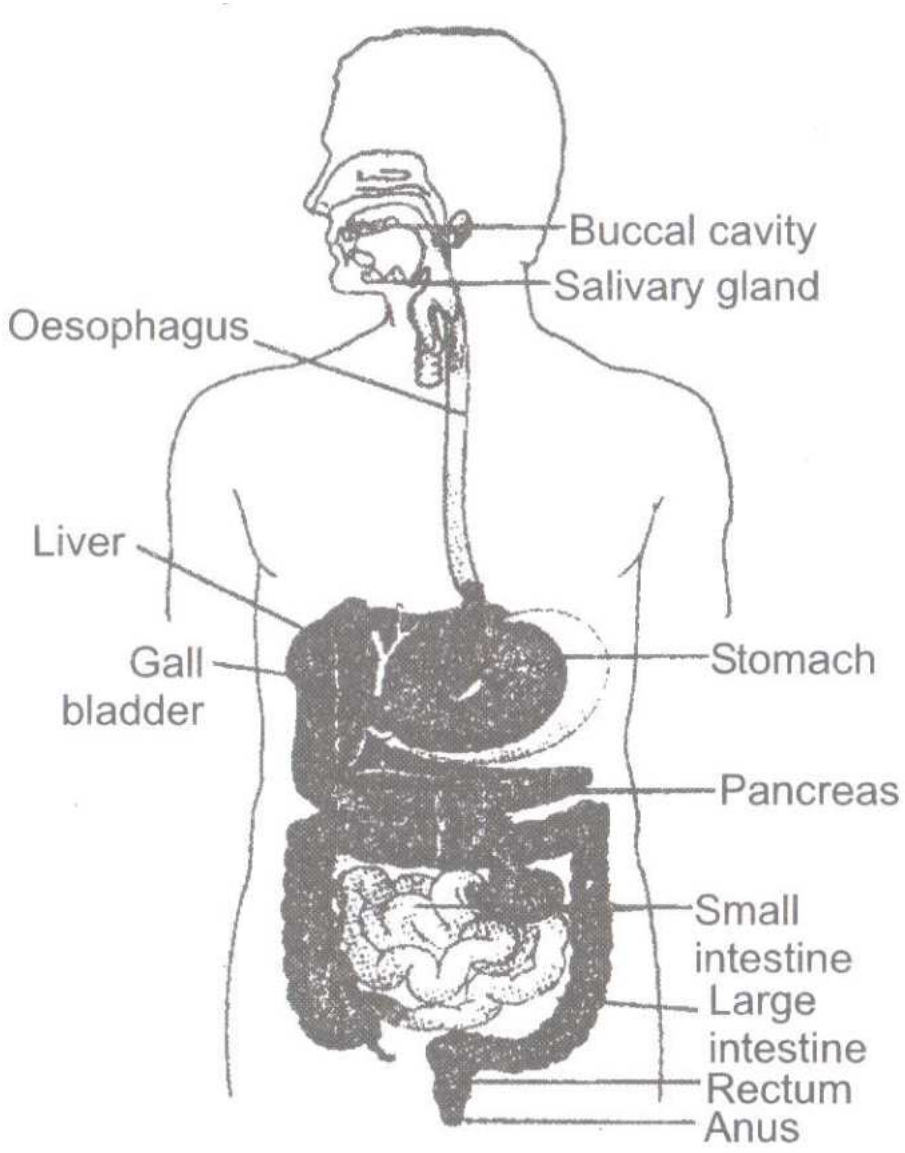
(i) small intestine	(ii) buccal cavity	(iii) stomach
(iv) small intestine	(v) large intestine.	

10. Write one similarity and one difference between the nutrition in amoeba and human beings.

Similarity : Both amoeba and human use digestive juices to digest food.

Difference : Human needs to chew food, whereas in amoeba, there is no chewing.

11. Label the given figure of the digestive system.



12. Can we survive only on raw, leafy vegetable / grass ? Discuss.

No, Because to live a healthy life we need a complete balance of all nutrients. Raw green vegetables may have cellulose which cannot be digested by us. So, only green leafy vegetables will not solve the purpose.

I. Very Short Answer Type Questions.

1 . What is nutrition?

The process of intaking and utilization of food by an organism is called nutrition.

2. What is digestion?

The process in which complex food materials are broken into simpler and absorbable substances is called digestion.

3. Do all animals nutrition?

No, all the animals do not have same mode of nutrition but different animals take food by different ways.

4. Where does the digestion start?

The digestion starts from the mouth and is completed in the small intestine.

5. Name the mode of nutrition of the organisms which synthesize their own food.

Autotrophic mode of nutrition.

6. Name the carbohydrate which is the instant source of energy.

Glucose

7. What is the other name of the digestive tract of human beings?

Alimentary canal

8. Write the name of the largest gland found in the human body which is essential for digestion of food but it does not secrete any digestive enzyme.

Liver.

9. What is the function of digestive juices?

The digestive juices convert complex substances of food into simpler, soluble and absorbable form.

10. What makes the digestive tract and glands when associated together?

Digestive system

11. Define the term ingestion.

The process of taking food into the body is called ingestion.

12. What are milk teeth?

The set of teeth that grows during infancy and fall at the age between 6 to 8 years are called milk teeth.

13. What are permanent teeth?

The set of teeth that replaces the milk teeth is called permanent teeth. These teeth may last throughout life or fall off during old age.

14. Name the various types of teeth.

(i) Molar (ii) Premolar (iii) Canine (iv) Incisor

15. Which type of teeth are used to cut and bite the food?

Incisor teeth

16. Name the teeth that are used for piercing and tearing the food items.

Canine

17. What are the functions of molar and premolar teeth?

Molar and premolar teeth are used for chewing and grinding the ingested food.

18. Name the juice secreted by salivary glands.

Saliva

19. Write the other name of food pipe.

The other name of food pipe is oesophagus.

20. What is the function of oesophagus?

The walls of oesophagus pushes the food towards the stomach.

21. Name the organ which identifies the taste of various food materials.

Tongue

22. What is stomach?

The thick walled and U-shaped bag like structure in the alimentary canal is called stomach.

23. Name the widest part of the alimentary canal.

Stomach

24. Name the secretions of stomach glands present in stomach wall.

(i) Mucous (ii) Hydrochloric acid (iii) Digestive juice containing pepsin enzyme

25. Write the name of the largest gland in our body.

Liver

26. What is the length of small intestine?

bout 7.5 metres

27. Name the secretion of liver and where is it stored?

Liver secretes bile juice which is stored in a sac like structure called gall bladder.

28. What is absorption?

The process by which digestive food pass into the blood vessels through the walls of small intestine is called absorption.

29. Name the finger like projections on the inner walls of small intestine.

Villi

30. What is the function of Villi?

Villi increase the surface area for absorption of digested food.

31. Define the term assimilation.

The process by which absorbed food is utilised to build complex substances like proteins and to give energy is called assimilation.

32. Define the term egestion.

The process of removal of faecal matter through anus time to time is called egestion.

33. What are ruminants?

The animals in which semi-digestive food returns back into mouth and the animal chews it are called ruminants.

34. What is the main component of animal food?

Cellulose

35. What are finger like projections in amoeba called?

The finger like projections in amoeba are called pseudopodia. These projections are not permanent. They are formed in any direction where they are needed.

36. What are food vacuoles?

In amoeba the food becomes trapped in some vacuoles called food vacuoles.

37. Is the basic process of digestion of food same in all animals?

Yes, the basic process of digestion of food in all animals is same.

38. Write extended form of ORS.

Oral Rehydration Solution.

39. Name partially digested grass stored in rumen.

Cud.

40. What is cellulose?

Cellulose is form of carbohydrate.

41. What is the location of pancreas?

Pancreas is located just below the stomach.

42. What is the simplest form of carbohydrate?

Glucose.

43. Name the juice secreted by liver.

Bile juice.

44. What is the nature of Bile juice?

Alkaline.

II. Very Short Answer Type Questions.

1. Name the parts of alimentary canal where digested food gets absorbed.

[NCERT Exemplar]

Small intestine.

2. Name the two components of digestive system..

Carbohydrates and fat.

3. Name the two parts of digestive system.

Digestive track and associated glands.

4. What is Bile?

Bile is a secretion secreted by liver.

5. What is Villi?

The finger like outgrowth in the inner walls of small intestine are called villi.

6. Name the parts of the alimentary canal where taste of the food is perceived.

[NCERT Exemplar]

Tongue.

7. Name the part of the alimentary canal where water gets absorbed from undigested food. **[NCERT Exemplar]**

Large Intestine.

8. You were blind folded and asked to identify the drinks provided in two different glasses. You could identify drink A as lime juice and B as bitter gourd juice. How could you do it inspite of being blindfolded? **[NCERT Exemplar]**

With the help of different types of taste buds present in the tongue.

9. In which structure bile juice is stored?

Gall-bladder.

10. Name the part of the alimentary canal where bile juice is produced.[NCERT Exemplar]

Liver.

III. Very Short Answer Type Questions.

1. Name the parts of the alimentary canal where

(a) water gets absorbed from undigested food.

(b) digested food gets absorbed.

(c) taste of the food is perceived.

(d) bile juice is produced.

(a) Large intestine (b) Small intestine (c) Tongue (d) Liver

2. Choose the odd one out from each group and give reasons.

(a) Liver, salivary gland, starch, gall bladder

(b) Stomach, liver, pancreas, salivary gland

(c) Tongue, absorption, taste, swallow

(d) Oesophagus, small intestine, large intestine, rectum

(a) Starch; others are glands.

(b) Stomach; others are digestive glands.

(c) Absorption; others are parts of the mouth.

(d) Small intestine; no juices are released by other parts/no digestion in other parts.

3. What is mastication?

The process of chewing the food is called mastication.

4. What is peristalsis?

The wave-like action by which food is gently pushed from mouth to the stomach via oesophagus is called peristalsis.

I. Short Answer Type Questions.

1. Boojho took some grains of boiled rice in test tube 'A' and Paheli took boiled and chewed rice in test tube Both of them poured 1-2 drops of iodine solution into the test tube and observed the colour change. What colour change would they have observed? Give reasons for your answer. [NCERT Exemplar]

Blue—black colour in test tube 'A because of presence of starch. In test tube 'B', colour of iodine will not change because of digestion of starch into sugars.

2. 'A' got her gall bladder removed surgically as she was diagnosed with stones in her gall bladder. After the surgery, she faced problems in digestion of certain food items when consumed in bulk. Can you tell which kind of food items would they be and why? [NCERT Exemplar]

The food items would be fat because bile juice of the gall bladder helps in the digestion of fat. Removal of gall bladder leads to difficulty in digestion of fatty substances.

3. Ruminants such as cows and buffaloes swallow their food hurriedly and then sit restfully and chew their food. Can you reason why? [NCERT Exemplar]

This is done for complete digestion of the food. When the food is swallowed by ruminants, it is only partially digested. It is then again chewed for its complete digestion.

4. Name the organs involved in the digestion of food in humans.

The organs involved in digestion are mouth, oesophagus, stomach, liver, small intestine, gall bladder and large intestine.

5. In which part of the human digestive system are bacteria present in the food killed? Explain how.

Bacteria in food are killed in stomach. The inner lining of stomach secretes hydrochloric acid and digestive juices which kill the bacteria in food.

II. Short Answer Type Questions.

1. Write the name of various components of food.

Components of food are following:

(i) Carbohydrates (ii) Fats Proteins

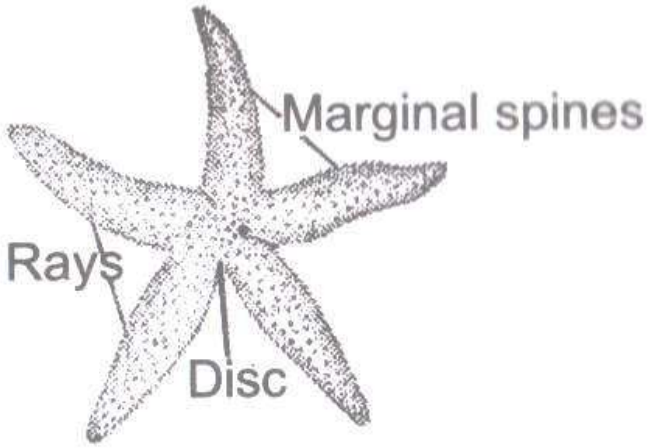
(iii) Proteins (iv) Vitamins

(v) Minerals (vi) Water and Roughage

2. What happens with the carbohydrates like starch in our body which are taken by us?

Carbohydrates are complex substances. These complex substances can not be utilised as such as we eat. They are broken down into simpler substances like glucose. This process is called digestion of carbohydrates.

3. Explain the mode of feeding of starfish.



Starfish feeds on aquatic 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. After eating the animal, the stomach goes back into the body and the food is slowly digested.

4. What do you mean by salivary digestion?

The food enters into the buccal cavity through mouth. It is chewed by the teeth and mixed with saliva. Saliva contains an enzyme called ptyaline (salivary amylase) which converts complex carbohydrates like starch into sugar. That is why the bread tastes sweet after chewing. This type of digestion is called salivary digestion.

5. What is tongue? Write its function.

Tongue is a fleshy muscular organ attached at the back to the floor of the buccal cavity and free at the front. It can move in all directions. It mixes the saliva with the food during chewing. It helps in swallowing the food. It has various taste buds which help to detect different tastes of food.

6. What happens when we do not clean our teeth after eating the food?

If we do not clean our teeth after eating the food, then various harmful bacteria begin to live and grow in it. These bacteria breakdown the sugar present in the food into acids and remain attached with teeth. The acid formed gradually damages the teeth. This is called tooth decay.

7. Explain the process of digestion in the stomach.

The inner lining of the stomach secretes the following things:

(i) **Mucous:** It protects the lining of stomach.

(ii) **Hydrochloric acid:** It kills the bacteria and makes food acidic.

(iii) **Digestive juices:** They breakdown the proteins into simpler substances.

8. What are digestive enzymes?

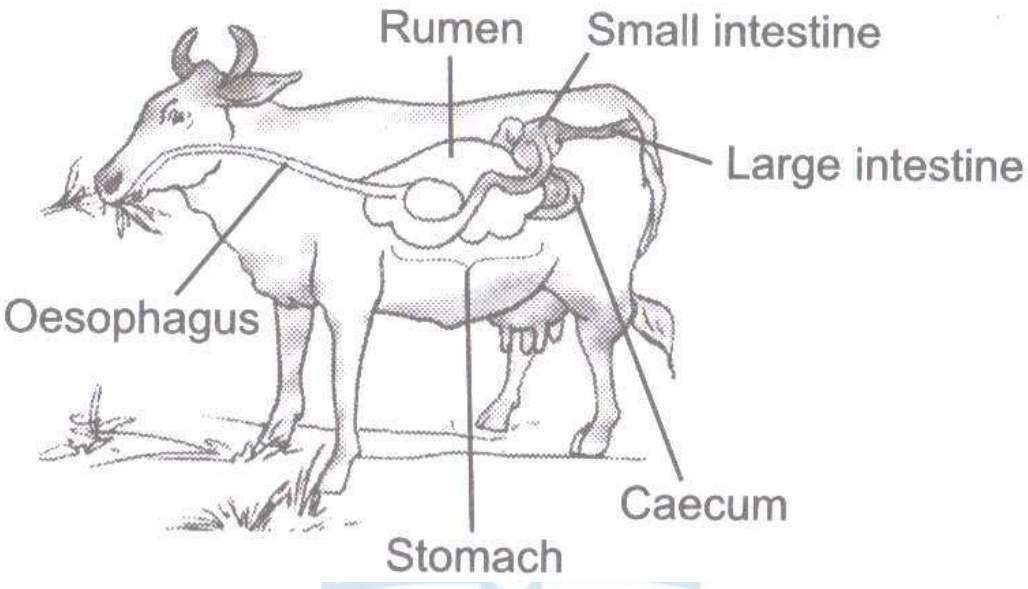
Enzymes are the secretions of various glands. These enzymes help in the digestion of various food components like carbohydrates, fats and proteins. These enzymes are catalytic in nature. They help in the breakdown of complex food materials. Some important enzymes are amylase, pepsin, tripsin and lipase. These enzymes are specific and act on specific food materials, e.g., salivary amylase on starch, lipase on fats and pepsin on proteins.

9. Explain the process of rumination.

The grass eating animals chew continuously even when they are not eating grass. They store the grass in a separate part of the stomach. This part is called rumen. Here the food gets partially digested to form cud. Later the cud returns to the mouth and animal chews it. This process is called rumination and the animals are called ruminants.

10. Explain the digestion of cellulose in the animals.

Many animals including humans cannot digest cellulose. But ruminants can digest it. They have a large sac like structure called caecum between the small intestine and large intestine. The cellulose of the food is digested in this part by the action of certain bacteria which are not present in the humans.



11. What are the various steps of nutrition?

Various steps of nutrition are:

(i) Ingestion (ii) Digestion (iii) Absorption

(iv) Assimilation (v) Egestion

12. What happens to undigested food?

The digested food is utilised by body while undigested food is stored in large intestine. Water and some salts are absorbed in large intestine from the undigested food. Remaining food wastes are removed away from the body through anus from time to time.

III. Short Answer Type Questions – I (2 marks each)

1. What do you understand by animal nutrition?

Animal nutrition includes nutrients, mode of intake of food and its utilisation in the body.

2. Name the various digestive organs of human.

The organs which are used to intake, to digest and to absorb the food are called digestive organs. The various digestive organs are mouth, buccal cavity, oesophagus, stomach, small intestine, large intestine. liver. gall bladder and pancreas.

3. What do you mean by the absorption ?

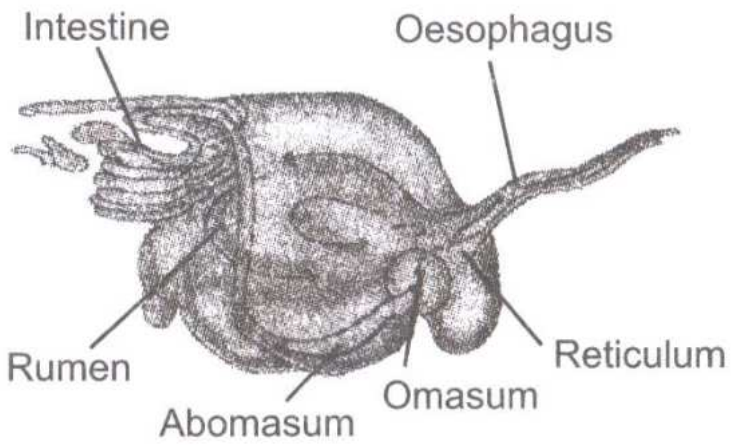
The digested food pass into the blood.vessels in the wall of the small intestine. This process is called absorption.

4. What is large intestine? Write its function.

Large intestine is the part of a alimentary canal which is wider and shorter than small intestine. 1 Its main function is to absorb water and some salts from the undigested food. It also helps in the egestion of undigested food.

5. What do you understand by rumen?

The grass eating animals quickly swallow the grass and store it in a separate part of the stomach. This part is called rumen.



6. What are milk teeth and permanent teeth?

Ans. The first set of teeth grows during infancy and they fall off at the age between six to eight years. 1 This set of teeth is called milk teeth. The second set of teeth that replaces them are the permanent teeth which may last throughout life

7. Explain the digestion of cellulose in the animals.

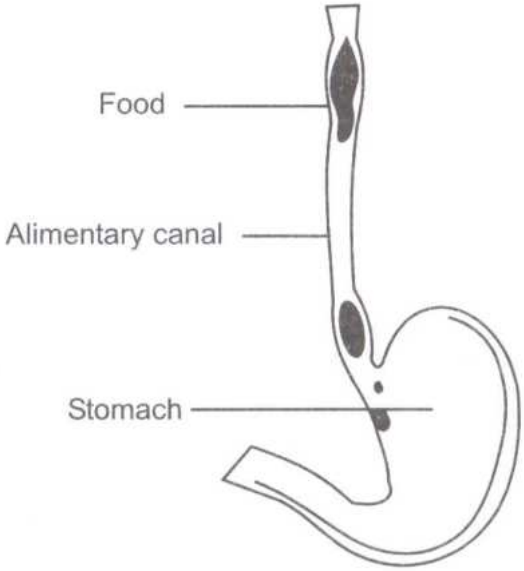
Many animals including humans cannot digest cellulose. But ruminants can digest it. They have a large sac like structure called caecum between the small intestine and large intestine. The cellulose of the food is digested in this part by the action of certain bacteria which are not present in the humans.

8. What are digestive enzymes ?

Enzymes are the secretions secreted by the various glands. These enzymes help in the digestion of various food components like carbohydrates, fats and proteins. These enzymes are catalytic in nature. They help in the breakdown of complete food materials. Some important enzymes are amylase, pepsin, trypsin and lipase, These enzymes are specific and act on specific food material, e.s., salivary amylase on starch, lipase on fats and pepsin on proteins.

9. What is a food pipe ? Write its functions.

A long tube along the neck and the chest is called a food pipe or oesophagus. The swallowed food passes into the food pipe. Food is pushed down by the movement of the wall of the food pipe. It pushed the food towards stomach.

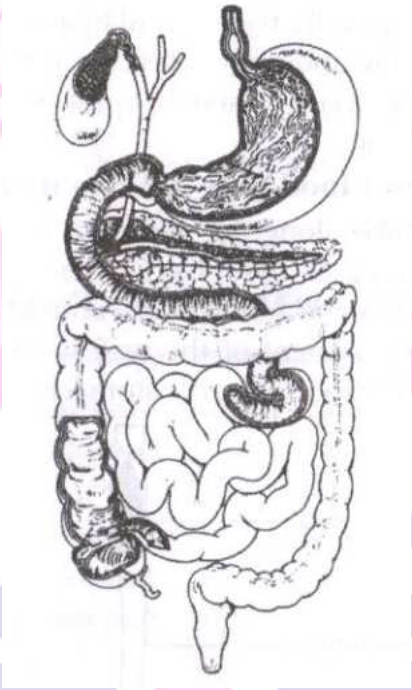


10. What happens when the food pushed by the food pipe is not accepted by the stomach?

When the food is not accepted by the stomach then it is vomited out.

11. Ruminants such as cows and buffaloes swallow their food hurriedly and then sit restfully and chew their food. Can you reason why ? (NCERT Exemplar)

To digest their food completely.



Label the following parts in Figure 2.2 and name them.

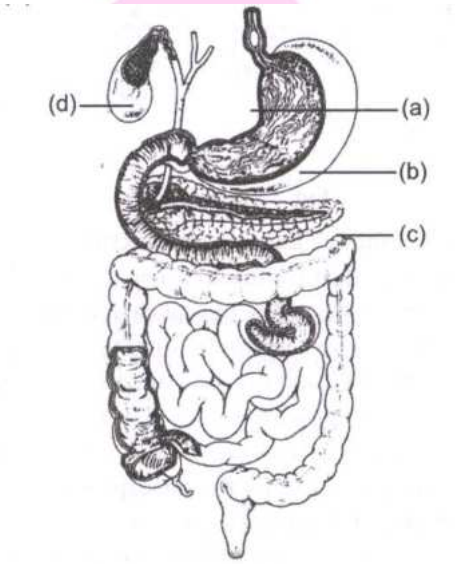
(a) The largest gland in our body.

(b) The organ where protein digestion starts.

(c) The organ that releases digestive juice into the small intestine.

(d) The organ where bile juice gets stored.

(a) Liver (b) Stomach (c) Pancreas (d) Gall bladder



III. Short Answer Type Questions – II (2 marks each)

1. Write three functions of tongue.

(i) It helps in talking.

(ii) It helps to mix saliva with the food.

(iii) It also helps in swallowing food.

2. What do you mean by tooth decay? Explain its process.

Or

What happens when we do not clean our teeth after eating food ?

If we do not clean our teeth and mouth after eating, many harmful bacteria start to live in it. These bacteria breakdown the sugars present from the leftover food and release acids. The acids gradually damage the teeth. This is called tooth decay. It causes tooth loss in many cases.

3. Write the three components and their functions of juice secreted by the inner wall of the stomach.

The inner lining of stomach secretes the following component :

(i) Mucous : It protects the lining of stomach.

(ii) Hydrochloric acid : It kills the germs and makes the food acidic.

(iii) Digestive juices : They help to break the proteins into simple substances.

4. Explain the process of rumination in the ruminant animals.

The animals which have a separate part of stomach (rumen) are called ruminants. In this part the food is partially digested and is called cud. But later the cud returns to mouth in small lumps and the animal chews it. This process is called rumination or chewing cud. These animals are called ruminants.

5. Explain the various types of teeth in human beings.

There are four kinds of teeth in human beings situated in each jaw :

Incisor : They are two in number and help to cut and bite food.

Canine : They are four in number and help in piercing and tearing of food.

Premolar : They are four in number and help in chewing and grinding the food.

Molar : They are six in number and also help in chewing and grinding the food like premolar teeth.

6. What happens with the carbohydrates like starch in our body which are taken by us?

Carbohydrates are complex substances. These complex substances cannot be utilised as such as we eat. They are broken down into simpler substances like glucose. This process is called digestion of carbohydrates.

7. Write various components of food.

The various components of food are as following :

(i) Carbohydrates

(ii) Fats

(iii) Proteins

(iv) Vitamins

(v) Minerals

(vi) Water and Roughage.

8. What do you mean by salivary digestion ?

The food enters into the buccal cavity through mouth. It is chewed by the teeth and mixed with saliva. Saliva contains an enzyme called ptyalin (salivary amylase) which converts complex carbohydrates like starch into sugar. That is why the bread taste becomes sweet after chewing . This type of digestion is called salivary digestion.

9. Boojho and Paheli were eating their food hurriedly so that they could go out and play during the recess. Suddenly, Boojho started coughing violently. Think of the reasons why he was coughing and discuss with your friends. (NCERT Exemplar)

Sometimes, when one eats hurriedly, talks or laughs while eating, the flap like valve, epiglottis closing the passage of windpipe remains open. The food may enter the wind pipe and coughing helps to clear it.

I. Long Answer Type Questions.

1. Explain the human digestive system with the help of labelled diagram.

When the ingest food in our mouth, salivary glands of the mouth secrete saliva which moistens the food. It also converts the starch into sugar. The tongue helps in chewing by moving the food in various directions. Saliva contains enzyme called salivary amylase which converts starch into sugar. From mouth, food goes into food pipe called oesophagus. As food enters into the food pipe, muscles of its wall starts contraction and relaxation movement. This

movement is called peristaltic movement that pushes the food into the stomach. The peristaltic movement occurs throughout the alimentary canal. The oesophagus leads the food to a saclike structure called stomach. The food is churned and partly digested in the stomach. The semi-solid food passes from the stomach to much coiled tube-like structure called the small intestine. The small intestine serves two purposes—digestion and absorption of the digested food. It is about 20 feet long. The inner surface of the small intestine has a large number of finger-like projections called villi. The villi increase the surface area for the absorption of digested food. The absorbed food enters into the blood stream and carried away to various parts of the body for assimilation. The undigested food moves from the small intestine to the large intestine where mainly absorption of water from the undigestion takes place. From the large intestine the undigested food passes to the rectum which pushes it out of the body through the opening called the anus as faeces.

2. How do ruminants digest the cellulose ?

The food of ruminants like grass is rich in cellulose (a type of carbohydrate). Ruminants have a large sac-like structure between the small intestine and large intestine. The cellulose of the food is digested here by the action of certain bacteria which are not present in humans. In this way ruminants can digest the cellulose but many animals including human can not digest cellulose.

3. Following statements describe the five steps in animal nutrition. Read each statement and give one word for each statement. Write the terms that describe each process.

(a) Transportation of absorbed food in different parts of body and their utilisation.

(b) Breaking of complex food substance into simpler and soluble substances.

(c) Removal of undigested and unabsorbed solid residues of food from the body.

(d) Taking food into the body.

(e) Transport of digested and soluble food from the intestine to blood vessels.

(NCERT Exemplar)

(a) Assimilation

(b) Digestion

(c) Ingestion

(d) Absorption

4. Read the following passage carefully and answer the question that follows it. 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. Bile juice breaks down big fat droplets into smaller droplets. These are then easily digested by the enzymes released from the pancreas.

a. Which organ secretes the bile juice?

b. Why is digestion of fats difficult as compared to that of other nutrients?

c. How does bile juice help in digestion of fat?

d. Where is the digestion of fat completed?

e. Does bile juice digest fat completely?

a. Liver

b. Insolubility of fat in water.

c. Breaks down big fat droplets into smaller droplets.

d. Small intestine

e. No

5. Open your mouth, look into a mirror and try to count the different types of teeth in your mouth. Compare them with Figure 2.3 on page 13 of your NCERT textbook. Record your observation in the table below.

Type of Teeth	Number of Teeth	
	In my mouth	In the figure
Incisors		
Canines		
Premolar		
Molar		

a. Did you observe any difference in the number of teeth? If yes, could you identify which type of teeth showed the difference?

b. Compare the number and type of teeth in an adult (Say your parents or cousins who have reached the age of 25-30 or more). Note your observation.

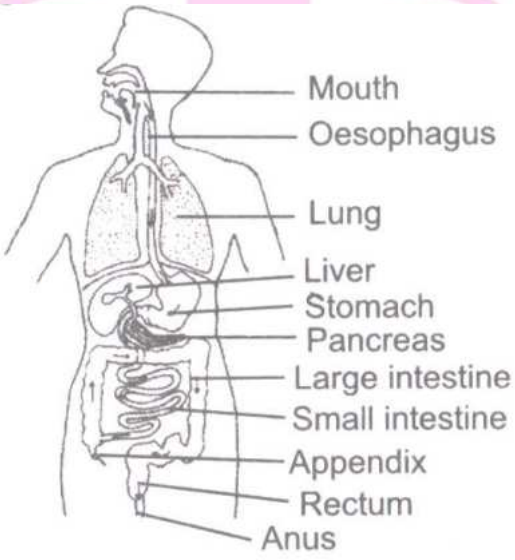
Children have 28 teeth in their mouth. There are only four molars in each jaw and not six. Adults have six molars in each jaw.

Type of Teeth	Number of Teeth	
	In my mouth	In the figure
Incisors	4	4
Canines	8	8
Premolar	8	8
Molar	8	12

II. Long Answer Type Questions.

1. Explain the human digestive system with the help of a labelled diagram.

When we ingest food in our mouth, salivary glands of the mouth secrete saliva which moistens the food. It also converts the starch into sugar. The tongue helps in chewing by moving the food in various directions. Saliva contains enzyme called salivary amylase which converts starch into sugar.



From mouth food goes into foodpipe called oesophagus. As food enters into the foodpipe, muscles of its wall start contraction and relaxation movement. This movement is called peristaltic movement that pushes the food into the stomach. The peristaltic movement occurs throughout the alimentary canal. The oesophagus leads the food to a sac like structure called stomach. The food is churned and partly digested in the stomach. The semi-solid food passes from the stomach to much coiled tube-like structure called the small intestine. The small

intestine serves two purposes—digestion and absorption of the digested food. It is about 20 feet long. The inner surface of the small intestine has a large number of finger-like projections called villi. The villi increase the surface area for the absorption of digested food. The absorbed food enters into the blood stream and carried away to various parts of the body for assimilation. The undigested food moves from the small intestine to the large intestine where mainly absorption of water from the undigested food takes place. From the large intestine the undigested food passes to the rectum which pushes it out of the body through the opening called the anus as faeces.

2. Suggest an experiment to explain the effect of saliva on starch.

Take 10 g of boiled rice in a 100 mL beaker and add 30 mL of water in it. Stir the mixture with a glass rod. Take some amount of this mixture in a test tube and add few drops of iodine solution to it. The colour of the solution becomes blue. It shows that rice contains starch. Take the remaining solution in the two test tubes. Add some amount of fresh saliva from your mouth in the test tube. Keep the test tube at 37°C to get better results. Observe the impact of enzyme present in the saliva on starch solution. Test the solution in the test tube for starch and sugar by adding iodine solution and Benedict's solution respectively. We observe that starch has been converted into sugar by saliva because it gives positive effect with Benedict's solution.

3. What is diarrhoea? How is it caused? How it can be prevented (cured)?

Diarrhoea: Sometimes you may have experienced the need to pass watery stool frequently. This condition is called diarrhoea.

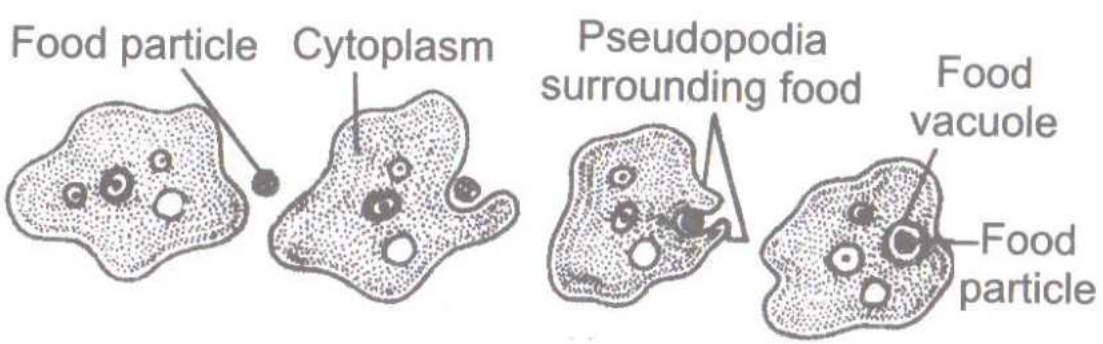
Causes: Diarrhoea may be caused by an infection, food poisoning or indigestion. It is most common in India. It can be fatal. This is because of the excessive loss of water and salts from the body. It should not be neglected.

Prevention: It can be prevented or cured by taking plenty of boiled and cooled water with a pinch of salt and sugar dissolved in it. This mixture is called ORS (Oral Rehydration Solution).

4. Explain the digestion in amoeba.

Amoeba is a microscopic unicellular organism. It is found in pond water. It has one or more finger like projections called pseudopodia or false feet for movement and for capturing of food.

Amoeba feeds on some microscopic organisms when it senses food, it pushes out pseudopodia around the food particle and engulfs it. The food becomes trapped in a food vacuole. Digestive juices are secreted into the food vacuole. They act on the food and break it down into simpler substances. Gradually digested food is absorbed. The absorbed substances are used for growth maintenance and multiplication. The undigested food (residue) is expelled outside by the vacuole.



5. Name some animals and write their mode of feeding.

S.No.	Name of Animal	Kind of Food	Mode of Feeding
1	Snail	Vegetation – lower plants	Scraping
2	Ant	Small particles of sugar, flour, etc	Chewing
3	Eagle	Small animals like rat, birds	Capturing, tearing and swallowing
4.	Humming-bird	Small insect and nectar	Capturing, swallowing and sucking
5	Lice	Blood	Sucking
6	Mosquito	Blood	Sucking
7	Butterfly	Nectar	Sucking
8	Housefly	Rubbish and many types of liquids and solids	Sucking

6. What are the various types of teeth? Write their functions.

Types of teeth	Number in each half of the jaw	Structure	Function
Incisors (Front teeth)	2	Have flat, sharp	Cutting and biting the

		edges	food
Canines	1	Sharp and conical	Tearing and piercing
Premolars	2	Bicuspid and have one or two roots	Crushing and grinding
Molars	3	Four or five cusps, have more than on root	Crushing, grinding and mastication.

III. Long Answer Type Questions.

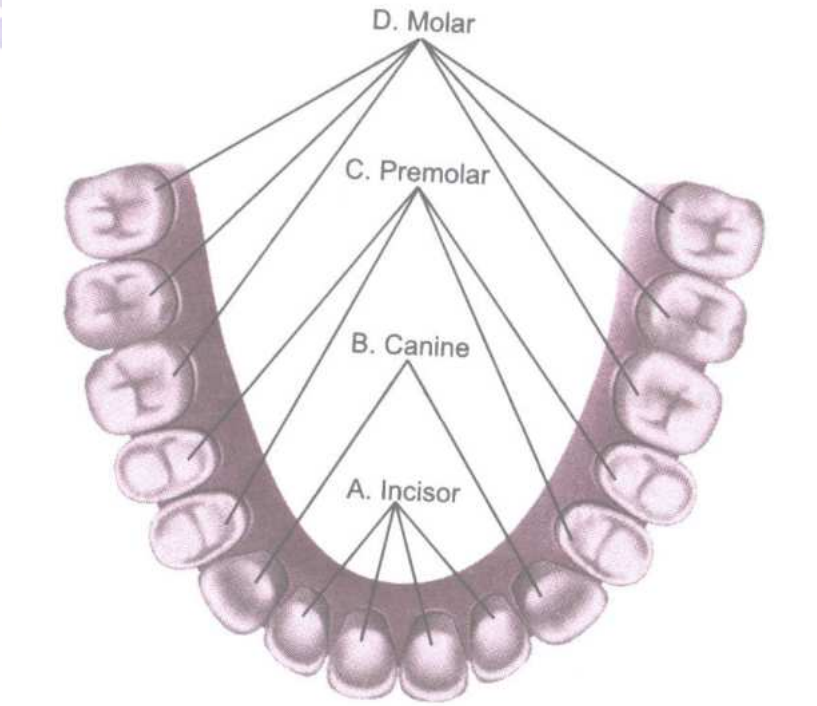
1. Draw a diagram of the buccal cavity and label the given types of teeth.

(a) The cutting and biting teeth as 'A'

(b) The piercing and tearing teeth as 'B'

(c) The grinding and chewing teeth as 'C'

(d) The grinding teeth present only in adults as 'D' D. Molar



2. (a) Draw a labelled diagram of the digestive system.

(b) Identify the following parts in the human body.

(i) The largest gland in our body.

(ii) The organ where protein digestion starts.

(iii) The organ that releases digestive juice into the small intestine.

(iv) The organ where bile juice gets stored. **[NCERT Exemplar]**

3. Write one similarity and one difference between the nutrition in Amoeba and human beings. [NCERT]

Similarity: Both Amoeba and human beings are heterotrophs and derive from other organisms. Dissimilarity: Human beings have a complex digestive system and different nutrients are digested in separate regions. Amoeba does not have a digestive system and all the nutrients are digested in the food vacuole.

4. What are villi? What is their location and function? [NCERT]

Villi are finger-like outgrowths on the inner walls of small intestine. The villi increase the surface area for absorption of the digested food. Each villus has a network of thin and small blood vessels close to its surface. The surface of the villi absorbs the digested food materials. The absorbed substances are transported via the blood vessels to different organs of the body.

5. Distinguish between the following.

(a) Milk teeth and Permanent teeth **(b) Ingestion and Egestion**

(a)

S.No	Milk teeth	Permanent teeth
i	These are first set of teeth that grow during infancy.	Milk teeth are replaced by a second set of teeth called permanent teeth.
ii	They fall off at the age of 6-8 years.	They are never replaced.

(b)

S.No	Ingestion	Egestion
i	The process of taking in of food inside the body.	The process of throwing out of undigested food materials from the body.
ii	It occurs through mouth.	It occurs through rectum.

6. Write the function of the following:

(a) Tongue

(b) Stomach

(c) Small intestine

(d) Large intestine

(a) Tongue: It moves the food around the mouth and mixes with saliva into a ball. It also helps in tasting the food.

(b) Stomach: It secretes digestive secretions containing enzymes that digests the food.

(c) Small intestine: Digestion of food completes in the small intestine and the villi on its wall help in complete absorption of digested food.

(d) Large intestine: It absorbs water and salts from the undigested food material.

7. List the five steps food undergoes during digestion.

a. Ingestion
b. Digestion
c. Absorption
d. Assimilation, and
e. Egestion

I. High Order Thinking Skills (HOTS) Questions.

1. How does food move in opposite direction during vomiting?

Food is pushed into the stomach by the peristaltic movement of the walls of oesophagus. Sometimes the food is not accepted by stomach and then the walls of food pipe move the food in opposite direction and food comes out as vomiting.

2. Why does a doctor put a glucose drip to a patient who has just been operated?

This is because the patient cannot digest the food and glucose needs no digestion.

3. Label the below given figure as directed below in (i) to iv) and give the name of each type of teeth.

[NCERT Exemplar]

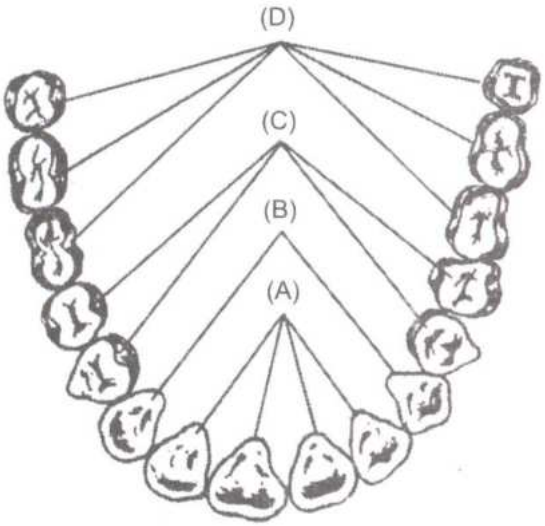
i. The cutting and biting teeth as 'A'

ii. The piercing and tearing teeth as 'B'

iii. The grinding and chewing teeth as 'C'

iv. The grinding teeth present only in adult as 'D'

A. Incisors B. Canines C. Premolars D. Molars



II. High Order Thinking Skills (HOTS) Questions.

1. Can we survive only on raw, leafy vegetables /grass? Discuss.

No, we cannot survive only on raw, leafy vegetable/grass. This is because grass is rich in cellulose which is not possible for us to digest.

2. How does food move in opposite direction during vomiting?

Food is pushed into the stomach by the peristaltic movement of the walls of oesophagus (food pipe). Sometimes, the food is not accepted by stomach, then the movement of walls of food pipe moves the food in opposite direction and food comes out as vomiting.

3. Why does a doctor put a glucose drip to a patient who has just been operated?

This is because the patient cannot digest the food and glucose being the simplest form, get easily absorbed and provide necessary energy to patient.

Value Based Questions

1. Rajesh wants to build up his body very quickly without following right exercise regime and balanced diet. Instead he started eating readymade food supplement. In your opinion was the step taken by Rajesh is right? Justify your answer.

i. No, the step taken by Rajesh was not right.

ii. It can lead to addiction and can affect the health adversely.

iii. We should not be influenced from others of taking any food supplements that might harm our health.

2. As Rishab is fond of eating chocolates, his mother always discusses about the importance of teeth in our life and to take care of it. Rishab is reluctant to follow the instruction given by his mother. One day while biting guava he saw blood patch on it. He became afraid and asked his mother the following questions.

i. Which is the problem coming in my teeth which cause toothache?

ii. How can I get rid of it?

iii. Which value is promoted by Rishab's mother?

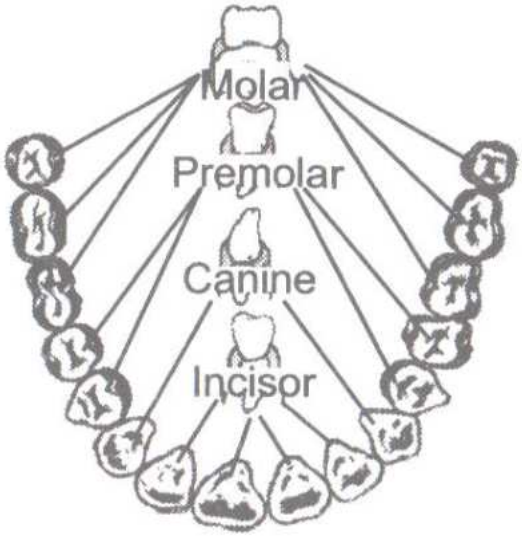
i. The problem is of tooth decay which causes toothache.

ii. One should clean the teeth with a tooth brush twice a day. Chocolates should be avoided.

iii. She is aware and concerned about the problems arising in the teeth especially of younger children.

Skill Based Questions

1. Draw a diagram of arrangement of teeth in human being and label various types of teeth.

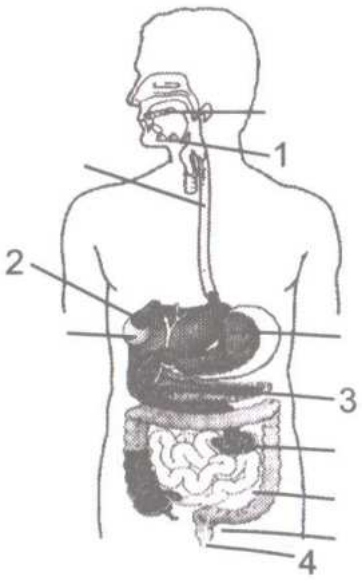


2. Refer the diagram of human digestive system and answer the following questions.

a. Label the part marked as 1, 2, 3 and 4.

b. Name the largest gland found in our body.

c. Name the digestive enzymes and their functions.



a. 1. Salivary gland 2. Liver 3. Pancreas 4. Anus

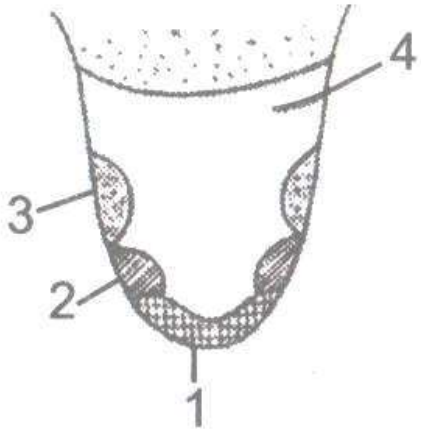
b. Liver is the largest gland.

c. 1. Amylase: digest carbohydrates.

2. Lipase; digest fats.

3. Tripsin : digest proteins

3. Identify the following figure and label the regions of salt, bitter, sweet and sour sensation on the given figure.



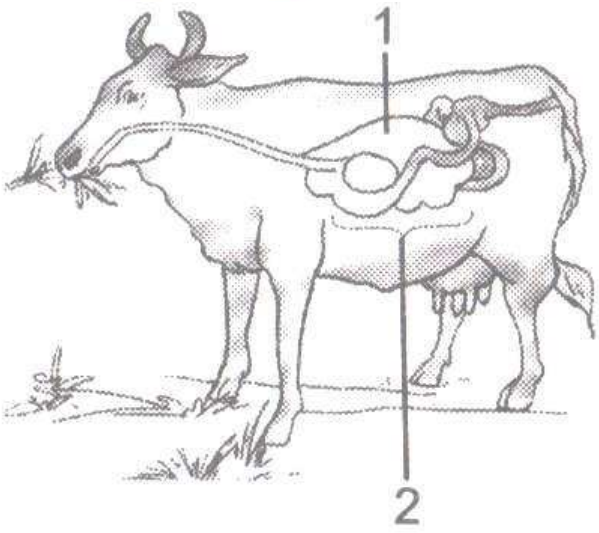
The given figure is the human tongue.

Regions are as under:

1. Salt 2. Sour 3. Sweet 4. Bitter

4. a. **Refer the diagram of digestive system of ruminant animal and label the parts marked as 1 and 2.**

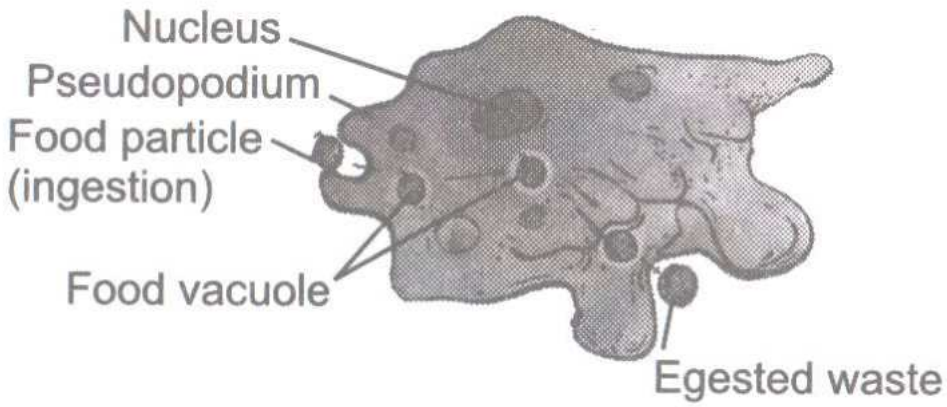
   b. **Name the partially digested food in rumen.**



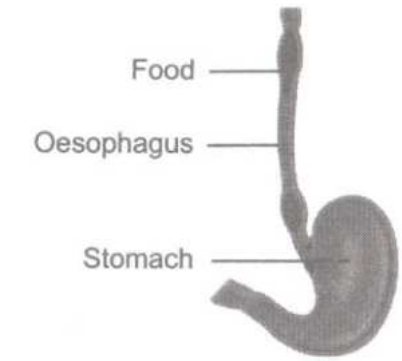
a. Ruminant Labelling: 1. Rumen 2. Stomach

b. Partially digested food in rumen is called cud.

5. **Draw a labelled diagram of amoeba.**

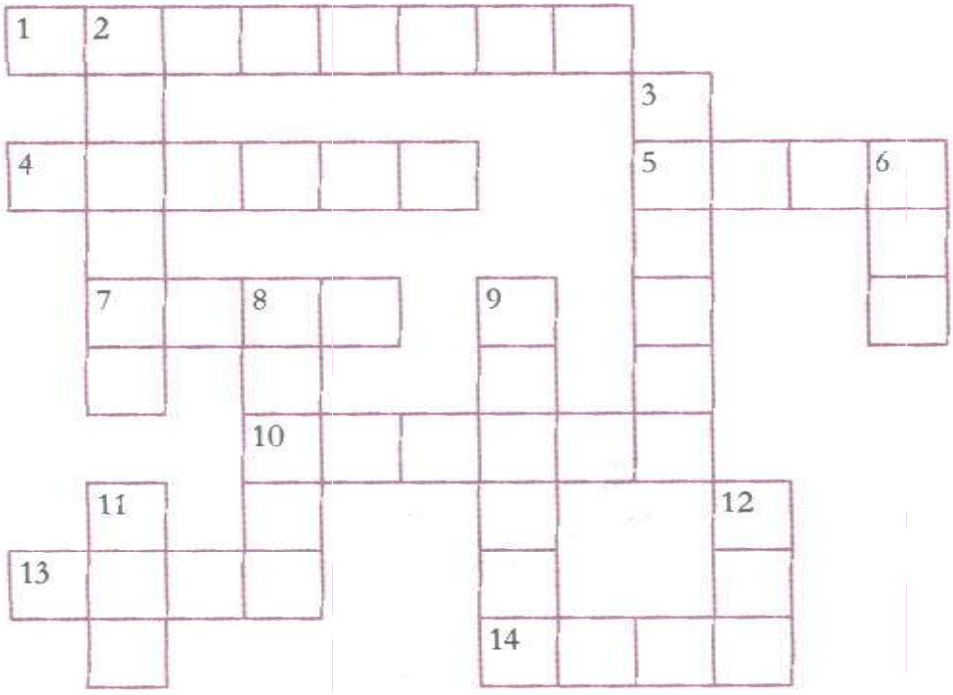


6. **Draw a diagram of oesophagus and stomach to show the movement of food in oesophagus of the alimentary canal.**



Cross the Puzzle

1.



Across

1. Cream-coloured digestive gland
4. Organ that mixes saliva with the food
5. Point of defecation
7. Stored in gall bladder
10. Finger like outgrowth in the small intestine
13. Kind of taste buds
14. Kills bacteria in the stomach.

Down

2. Feeds with the help of pseudopodia
3. Undigested excretory solid residues
6. Total number of molars in one jaw of an adult.
8. Largest gland
9. Watery secretion in the mouth.
11. A ruminant
12. Form of food chewed by ruminants

Across

1. Pancreas

4. Tongue

5. Anus

7. Bile

10. Villus

13. Sour

14. Acid

Down

2. Amoeba

3. Faeces

6. Six

8. Liver

9. Saliva

11. Cow

12. Cud