Question Bank
Digestive System

1. Define digestion. Why is it necessary ?

Ans. Digestion is the process by which insoluble complex food substances are broken down into soluble and simpler form having smaller molecules, which can easily be absorbed by blood.

It is through this process of digestion that food is converted into simpler diffusible molecules which can easily pass through membranes and enter blood. Food is thus carried to all parts of the body.

2. State the importance of hydrochloric acid in stomach.

Ans. Hydrochloric acid in stomach performs two functions :

(i) It kills bacteria swallowed along with the food.

(ii) It provides an acidic medium for pepsin to act upon proteins.

3. Give the end products of digestion of protein, fats and carbohydrates.

Ans. Proteins → Amino acids

Fats → Fatty acids and glycerol

Carbohydrates → Simple sugars

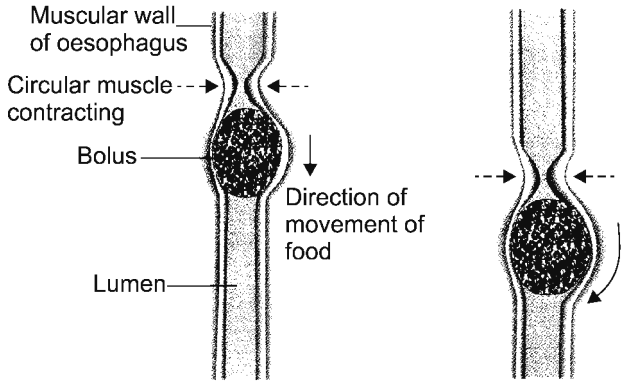
Starch → Maltose → Glucose

Sucrose → Glucose and fructose

Lactose → Glucose and galactose.

4. Define peristalsis. Mention its role in digestion.

Ans. The movement of food along the oesophagus and rest of the alimentary canal is brought about by the rhythmic contraction and relaxation of the muscular walls. The rhythmic waves of contractions and relaxation by which food moves down the alimentary canal is called peristalsis. Peristalsis thus help in the movement of food downwords in the alimentary canal.



Movement of Bolus in oesophagus by peristalsis

5. What are villi ? How are they adapted for the absorption of food ?

Ans. Villi are finger-like projections on the inner surface of small intestine. Each villus is covered by a single layer of epithelium and contains blood capillaries and lymph vessel.
Villi increase the surface area for absorption. The epithelium of villi helps in easy diffusion of digested food.

6. What is the fate of food after it is digested and absorbed ?

Ans. The food after digestion and absorption is assimilated into body substances and protoplasm of the cells. This takes place in following ways :

(i) The final products of fat digestion — fatty acids and glycerol — are absorbed in the blood stream through the lacteals. In the body, they are again converted into fats and excess fats are stored in adipose tissue. This stored fat can be utilized by the body in times of need.

(ii) The simple sugars absorbed through the intestinal villi are used for generating energy for various life activities. The excess sugars are converted in man into a complex polysaccharide, **glycogen**, in the liver. It can be reutilized during stress conditions.

(iii) The amino acids are utilized to synthesize different proteins required by the body. Amino acids are not stored in the body, but excess amino acids may be converted into glucose and stored for future use.

7. What are enzymes ? Give three characteristics of enzymes.

Ans. Enzymes are chemical compounds, proteinaceous in nature, produced in the cells of living organisms.

Characteristics of Enzymes : Enzymes show the following characteristics :

(a) Enzymes are **proteins** in nature. Being proteinaceous, they are destroyed by heating.

(b) Enzymes are **biocatalysts;** they accelerate the rate of chemical reactions.

(c) Enzymes are **specific** in their action. A particular enzyme acts only on one substrate.

(d) Enzymes always produce the **same end-product.**

(e) Enzymes work within a **narrow temperature range** of 35°C to 40°C. At higher or lower temperatures, enzyme activity is reduced. At very high or very low temperatures, enzymes become ineffective as they get destroyed.

(f) Enzymes are sensitive to changes in **acidity or alkalinity** (pH). They act most rapidly in a particular degree of acidity or alkalinity. For example, the enzyme – pepsin requires an acidic medium, while trypsin requires an alkaline pH.

8. Name the enzymes present in the succus entericus.

Ans. Peptidase, lipase, maltase, sucrase and lactase.

9. State three conditions under which the enzymes become inactive.

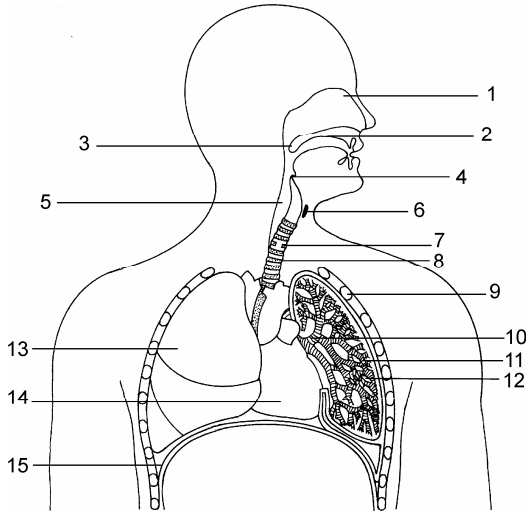
Ans. **(i)** At very high or very low temperatures, enzymes become inactive.

(ii) Since enzymes require a specific pH to act upon, any change in acidity or alkalinity of the medium affects the enzyme activity or even inactivates them.

(iii) Some chemicals inactivate the enzymes.

10. Draw a labelled diagram to show the alimentary canal of man.

Ans.



Digestive System of Human

11. Name the enzymes present in pancreatic juice and state their functions.

Ans. **Pancreatic juice** contains a number of enzymes which act in alkaline medium. The enzymes are

(i) **Trypsin :** converts remaining proteins into peptones and the peptones into peptides and amino acids,

(ii) **Amylase :** converts the undigested starch into maltose (continues the process begun in mouth), and

(iii) **Steapsin (Lipase) :** converts fats into fatty acids and glycerol.

12. What is bile ? Give its function.

Ans. (i) Bile : It is a yellowish fluid produced in liver and stored in gall bladder. It contains

(a) Sodium salts : These reduce the acidity of chyme (making the medium alkaline) and emulsify fats (breaks them into smaller globules and lowers the surface tension), and

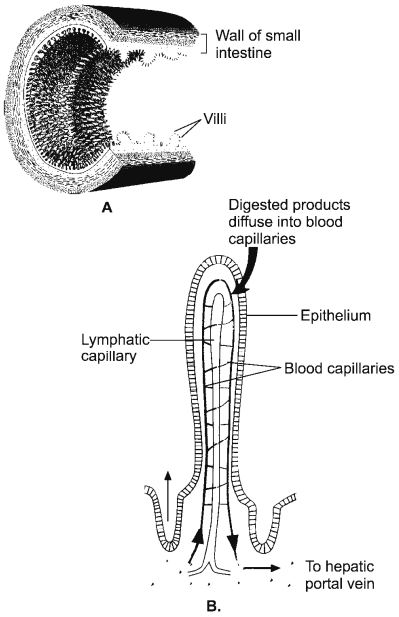
(b) The pigments which are the excretory products resulting from desintegration of red blood cells (this gives yellow colour to the bile). Bile contains no enzymes.

13. How is ileum adapted for the absorption of food?

Ans. The ileum is well adapted for the process of digestion. It is long so that food is retained in it for a longer period, and shows following characters:

(a) The inner lining of small intestine has millions of finger-like projections called villi throughout its length. These increase the surface area for absorption.

(b) The epithelium of villi has mucus lining throughout its length for easy diffusion of digested food.



(A.) Section through small intestine showing villi on the inner surface; B. Single villus (enlarged.)

14. One should not talk during swallowing. Give reasons.

Ans. During swallowing, the food has to pass over the windpipe (trachea) to enter the oesophagus. To avoid the entry of food into the trachea and choking, one should not talk during swallowing.

15. What is dentition? Give dental formula of man, dog and rabbit.

Ans. Dentition

The arrangement of different types of teeth on the jaws is called **dentition.**

Dental formula of man $I = \frac{2}{2}, C = \frac{1}{1}, Pm = \frac{2}{2}, M = \frac{3}{3} = \frac{8}{8} 2 = 32$

Dental formula of dog $I = \frac{3}{3}, C = \frac{1}{1}, Pm = \frac{4}{4}, M = \frac{2}{3} = \frac{10}{11} 2 = 42$

Dental formula of rabbit $I = \frac{2}{1}, C = \frac{0}{0}, Pm = \frac{3}{2}, M = \frac{3}{3} = \frac{8}{6} 2 = 28$

16. Distinguish between the following :

(i) Homodont and Heterodont teeth.

(ii) Milk teeth and Permanent teeth.

(iii) Dentine and Enamel.

Ans. (i) Differences between Homodont and Heterodont teeth

Homodont teeth	Heterodont teeth
All the teeth are of same kind. **Examples** - Reptiles, fish.	More than one type of teeth differing in shape, size and function present. Example - Mammals

(ii) Differences between Milk teeth and Permanent teeth

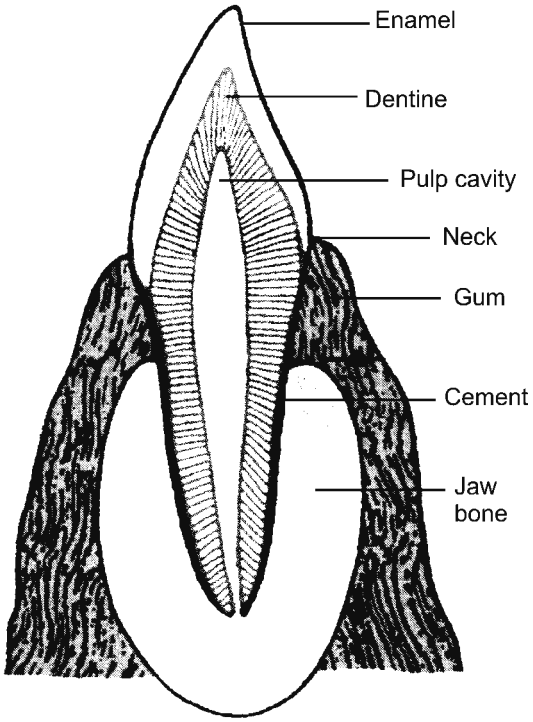
Milk teeth	Permanent teeth
1. These are temporary or deciduous teeth, as they fall off. 2. Present in children. 3. Full milk dentition consists of 20 teeth.	They do not fall, and replace milk teeth. Present in adults. Full permanent dentition consists of 32 teeth.

(iii) Differences between Dentine and Enamel.

Dentine	Enamel
1. It is present below the enamel.	It is the outer white covering of the crown of teeth.
2. It is not as hard as the enamel.	It consists of the hardest substance in the body.
3. It is supplied with blood Capillaries and nerves in the pulp cavity.	It is not supplied with blood capillaries and nerves.
4. It contains living cells.	No living cells present.

17. Draw a labelled diagram to show the internal structure of a tooth.

Ans.



L.S. of an incisor tooth to show the internal structure.

18. Write the functions of the following parts :
(i) Enamel **(ii)** Pulp cavity **(iii)** Cement

Ans. (i) Enamel — Being hard, it helps in biting, crushing and grinding food.
(ii) Pulp cavity — It supplies the tooth blood vessels and nerves. Blood nourishes the tooth, while the nerves receive and transmit sensations of pain to the brain.
(iii) Cement — It holds the tooth firmly in the sockets of the jaw.

19. Name the different kinds of teeth in mammals and state their functions.

Ans. Different kinds of Mammalian teeth and their functions

Type of tooth	Number of each kind in half of each of jaw in man	Structure	Function
Incisors	2 Front teeth	Have flat, sharp edges.	Cutting and biting the food.
Canines	1	Pointed edge	Tearing and piercing.
Premolars	2	Bicuspid (two cusps) and have one or two roots.	Crushing and grinding.
Molars	3	Four or five cusps. Have more than one root.	Crushing, grinding and mastication.

20. Explain the following terms:
(i) Diastema **(ii)** Dentine.

Ans. (i) Diastema : In herbivores like rabbit, canines are absent and a gap is present between the incisors and the premolars. This gap is called diastema.
(ii) Dentine : Dentine is the hard yellowish bone-like tissue below the enamel in a tooth. It is not as hard as the enamel.

21. Mention whether the following statements are True (T) or False (F) :

(i) In an adult human, there are 4 molar teeth in each jaw.
(ii) Cats and dogs are carnivorous animals.
(iii) Teeth in fish are of one type only (homodont).
(iv) The last molar tooth is called wisdom tooth.
(v) The part of the tooth lying above the gum is called the neck.
(vi) Blood capillaries and nerves are present in the pulp cavity of the teeth.

Ans. **(i)** F **(ii)** T **(iii)** T **(iv)** T **(v)** F **(vi)** T