

- The components of the normal diet include carbohydrates, lipids, proteins, vitamins, minerals and water.
- Complex food materials are broken down by digestive enzymes to form simple substances which are digestible and these substances then absorbed in the alimentary canal and this biochemical process is called digestion.
- Digestive tract is muscular, which has mouth, (buccal/oral cavity-teeth), Pharynx, oesophagus, Stomach, duodenum, Small intestine, large intestine, rectum and anus aperture.
- In addition accessory digestive glands are - Liver, Gall bladder and pancreas are included in the digestive system.
- Alimentary tract - Ingestion of food, Digestion and absorption and ejection like process are associated with this tract.

Mouth (Oral cavity -Teeth)

- The mouth leads to the buccal cavity/oral cavity. It is bounded by the maxillary bones, cheeks, chin and the lips.
- Mouth is connected at posteriorly with pharynx.
- Roof of mouth is made up of (1) Hard palate and (2) Soft palate.
- Tongue is present in the basal side of mouth.
- In oral cavity, in jaw tooth is embedded in socket it is called thecodont.
- Dentition of teeth is dichyodont type (Milky teeth and permanent teeth)
- Wjem 20 milky teeth fall, upto 32 number permanent teeth develop.
- In human, all teeth are not identical (Heterodont).
- Four types of teeth are found : (1) Incisor (I), (2) Canine (C), (3) Premolar (PM), (4) Molar (M)
- Each tooth has a crown, root and neck region.
- Crown is made of strong enamel which composed of calcium and phosphate as a dentine metal.
- Dentine / tooth pulp has connective tissue, blood vessels and nerves.
- The tongue is attached to the hyoid bone, at the base of mouth, through frenulum.
- On tongue taste buds are present - on the papillae, which are small projections.

Four types of papillae : (i) Vallate papillae (ii) fungiform papillae (iii) Filiform papillae (iv) Simple papillae

- In humans three pairs of salivary glands open in the oral cavity.
 - The parotid glands are the main salivary gland which comes to lie below the ear.
 - The sub mandibular glands lie on each side beneath the jaw bone.
 - The sublingual glands lie beneath the tongue.
- (1) What is responsible for converting food components in digestive tract into simple structural forms ?
(A) Hormones (B) Enzymes (C) Vitamins (D) Mineral elements
 - (2) Which types of enzymes are found in digestive tract ?
(A) Oxido reductase (B) Transferase (C) Hydrolases (D) Synthetases

- (3) Which of the following is not a function of the digestive tract ?
 (A) Synthesis of food (B) Churning and swallowing food
 (C) Digestion of food (D) Egestion of undigested food
- (4) It forms the roof of buccal cavity.
 (A) Lips (B) Mandible (C) Hyoid bone (D) Palate
- (5) What is the location of uvula ?
 (A) Anterior side of hard palate (B) Middle region of hard palate
 (C) Middle region of soft palate (D) Anterior region of soft palate
- (6) Tongue, is attached to which bone to form floor of oral cavity ?
 (A) Mandible (B) Hyoid (C) Maxilla (D) Palatine
- (7) What is not correct for oral cavity ?
 (A) Muscular tongue (B) Salivary gland
 (C) Many teeth (D) Bifid tongue
- (8) What is the Dental Formula for adult man ?
 (A) $\frac{2123}{2122}$ (B) $\frac{2132}{2132}$ (C) $\frac{2123}{2124}$ (D) $\frac{2123}{2123}$
- (9) Number of teeth formed only once in human.
 (A) 4 (B) 22 (C) 12 (D) 32
- (10) What is the type of human teeth ?
 (A) Thecodont (B) Diphydont (C) Heterodont (D) All of above
- (11) What is the number of teeth growing twice in human ?
 (A) 12 (B) 32 (C) 30 (D) 28
- (12) Which is the hardest region of tooth ?
 (A) Dentine (B) Bone (C) Enamel (D) Pulp
- (13) Select proper pair from the following.
 (A) Crown-Bony region (B) Enamel-Calcium Phosphate
 (C) Neck-Covered by crown (D) Dentine-Pulp
- (14) Which part of the tongue is connected with frenulum in oral cavity ?
 (A) Posterior (B) Anterior (C) Dorsal (D) Lateral
- (15) Which Structures are found on the tongue besides papillae ?
 (A) Mucous glands (B) Lymph glands (C) Lymph nodules (D) A and C both

Answers : (1-B), (2-C), (3-A), (4-D), (5-C), (6-B), (7-D), (8-D), (9-C), (10-D), (11-C), (12-C), (13-B), (14-A), (15-C)

Digestive tract :

Pharynx : It lies behind the nose, mouth and larynx.

- It is a cone shaped Muscular membranous passage.
- It is about 12.5 cm long.
- It is divided into three portions (1) Nasopharynx (2) oral pharynx and (3) Laryngeal pharynx.
- **Oesophagus :** Pharynx opens from distal end in the Oesophagus.

Which has muscular tube like structure. Its length is 23 to 25 cm.

It extends posteriorly passing through neck, thorax and diaphragm and leads to stomach.

- **Stomach :** It is the most dilatable portion of alimentary canal. It is divided in three portions. Cardiac stomach, fundus and pyloric stomach.

Pyloric stomach opens in duodenum by pyloric valve.

- **Small intestine :** In man length of small intestine is 6.5 m.

Duodenum : Initial part of it is 25 cm long and it is U-shaped portion in which common Hepeto-pancreatic duet opens.

- Jejunum - long convoluted area, which have digestive glands.
- Small intestine open in large intestine by ilio - coecal valve.
- **Large intestine :** It is called colon. It is 1.5 m. in length. It starts from close bay like structure is caecum. It has three areas. (1) Ascending colon (2) Transverse colon and (3) Descending colon which opens into the rectum which opens out through anus.

(16) Pharynx is behind which part ?

- (A) Mouth (B) Nose (C) Larynx (D) all of above

(17) Pharynx is which type of muscular passage ?

- (A) Cone shaped without serosa (B) Cone shaped with serosa
(C) Oblong without serosa (D) Tubular with serosa

(18) What is the length of pharynx ?

- (A) 125 mm (B) 125 cm (C) 100 mm (D) 110 mm

(19) Oesophagus is how long ?

- (A) 23 to 25 Meter (B) 23 to 25 feet
(C) 2.3 to 2.5 cm (D) 230 to 250 mm

(20) Part of digestive tract, which has sphincter muscle

- (A) Duodenum (B) Pyloric stomach (C) Oesophagus (D) B and C both

(21) Which part of stomach is situated beneath diaphragm in human ?

- (A) Cardiac stomach (B) Fundus (C) Pyloric stomach (D) Pyloric mouth

(22) What is the length of small intestine ?

- (A) 6.25 cm (B) 6.25 meter (C) 6.25 mm (D) 625 meter

(23) Small intestine ends in which region ?

- (A) At the region of pyloric valve (B) At the region of ilio-coecal valve
(C) At the region of 'u' bend of duodenum (D) Region, where Rectum opens

- (24) What is the location of small intestine in human body ?
 (A) In the Navel region of abdomen surrounded by duodenum.
 (B) In the navel region of abdomen surrounded by ribs.
 (C) In the Navel region of abdomen surrounded by large intestine.
 (D) In the navel region of abdomen surrounded by pancreas and spleen.
- (25) What is involved in the formation of common bile duct ?
 (A) Cystic duct and hepatic duct. (B) Hepatic duct and salivary duct.
 (C) Pancreatic duct and hepatic duct. (D) Bile ducts and pancreatic duct
- (26) Caecum opens into which part of digestive tract in human ?
 (A) Midgut (B) Colon (C) Fore gut (D) Hind gut
- (27) Descending part of colon opens into
 (A) Urinary bladder (B) Appendix (C) Caecum (D) Cloaca
- (28) Finger like projection of caecum is called
 (A) Colon (B) Intestinal nodes (C) Caecum tail (D) Intestinal tail
- (29) Which organ of digestive tract glands are present in submucosal layer ?
 (A) Duodenum (B) Rectum (C) Mid gut (D) Pancreas
- (30) What is proper for arrangement of muscles in muscularis layer ?
 (A) Circular muscles outside, longitudinal muscles inside.
 (B) Longitudinal muscles outside, circular muscles inside.
 (C) Sphincter muscle outside, voluntary muscles inside.
 (D) Voluntary muscles outside, Cardiac muscles inside.
- (31) What is involved in the formation of submucosal layer ?
 (A) cells, nerves, blood vessels, Bones
 (B) bones, nerves, blood vessels and digestive glands
 (C) tissues, nerves, blood vessels, and lymph vessels
 (D) tissues, digestive glands, blood vessels and lymph glands
- (32) What is present in papillae ?
 (A) Blood vessels or large lymph vessels
 (B) Only lymph glands
 (C) Network of blood capillaries
 (D) Network of blood capillaries and large lymph vessels.
- (33) What is the function of papillae in digestive tract ?
 (A) Increases absorptive surface area
 (B) Storage of food
 (C) Absorption of food
 (D) A and C both
- (34) Which cells secrete mucous in mucosal layer ?
 (A) Oxyntic cells (B) Goblet cells (C) Peptic Cells (D) Gall bladder cells

Answers : (16-D), (17-B), (18-A), (19-D), (20-D), (21-B), (22-B), (23-B), (24-C), (25-A), (26-B), (27-D), (28-C), (29-A), (30-B), (31-C), (32-D), (33-D), (34-B)

Accessory digestive glands and functions of Alimentary canal :

- The wall of alimentary canal possesses four layers : from outside (1) Serosa (2) Muscularis (3) Submucosa and (4) Mucosa.
- Glands are present in submucosa of duodenum.
- In stomach, in mucosa small irregular folds are present and small finger like foldings called villi, in small intestine.
- Globlet cells of mucosa secrete mucus.
- Gastric glands are present in mucosa of stomach, which secretes the various digestive juices.

Liver :

- It is largest gland in the body. It weighs 1.2 to 1.5 kg.
- It is wedge-shaped and reddish brown in colour. Bile juice is secreted by hepatic cells. Liver is made up of two lobes.

Gall bladder :

- The duct of gall bladder (cystic duct) along with the hepatic duct forms the common bile duct. The bile duct and the pancreatic duct open together into the duodenum as the common hepatopancreatic duct.

Pancreas : It is situated between the loop of the 'U' shaped duodenum. It is an exocrine and as well as endocrine gland (endocrine - secretion of Insulin and glucagon, exocrine = secretion of pancreatic juice)

Functions of alimentary canal :

- **Mouth :** Mastication (biting and grinding of food), to soften the food, form the bolus and swallowing.
- **Pharynx :** Passes food to oesophagus.
- **Oesophagus :** Food passes to stomach.
- **Stomach :** Temporary storage of food, partial digestion of food by the gastric juice.
- **Small intestine :** Digestion of chyme, absorption of digested substances.
- **Large intestine :** Absorption of water, salt and glucose.
- **Rectum :** Stores semi-solid stool.
- **Liver :** Largest chemical factory of body prepares waste components for excretion.
- **Pancreas :** Its exocrine part secretes pancreatic juice and endocrine part secretes insulin and glucagon.

Functions of digestive system : Ingestion of food, digestion, absorption and ejection of stool.

(35) Which is largest gland in human ?

- (A) Pancreas (B) Gall bladder (C) Liver (D) Spleen

(36) What is weight of liver in human ?

- (A) 12 to 15 kg (B) 12 to 15 gm (C) 1200 to 1500 gm (D) 1.2 to 1.5 mg.

(37) Pancreas structure is similar to which gland ?

- (A) Salivary gland (B) Sebaceous gland (C) Pineal gland (D) Spleen

(38) Which gland is with duct and without duct in digestive tract ?

- (A) Gall bladder (B) Liver (C) Pancreas (D) Salivary gland

- (39) Which hormones are secreted by pancreas ?
 (A) Insulin (B) Glucagon
 (C) Insulin or glucagon (D) Insulin and glucagon
- (40) Absorption of water, minerals and glucose in large quantity, is by
 (A) Stomach (B) Oesophagus (C) Duodenum (D) Colon
- (41) reacts with sugar and digested starch.
 (A) Triglyceride (B) Tyrosine (C) Transferases (D) Ptylin
- (42) Which organ absorbs water, mineral elements and glucose in less quantity ?
 (A) Stomach (B) Large intestine (C) Oral cavity (D) A and B Both
- (43) Which organ converts chyme into chyle ?
 (A) Stomach (B) Large intestine (C) Small intestine (D) B and C Both
- (44) Which organ converts poisonous and useless substances into excretory product ?
 (A) Kidney (B) Liver (C) Gall bladder (D) Colon
- (45) Which of the following digestive juice is acidic ?
 (A) Intestinal juice (B) Salivary juice (C) Gastric juice (D) Pancreatic juice
- (46) Which digestive juice contains solid 0.5% substances ?
 (A) Gastric juice (B) Saliva (C) Pancreatic juice (D) Bile juice
- (47) Which digestive juice contains 0.55 % solid substances ?
 (A) Intestinal juice (B) Bile juice (C) Gastric juice (D) Pancreatic juice
- (48) Which digestive juice does not contain enzymes ?
 (A) Pancreatic juice (B) Bile juice (C) Salivary juice (D) Intestinal juice
- (49) Which digestive juice contain lipase ?
 (A) Gastric juice (B) Pancreatic juice (C) Intestinal juice (D) All of above
- (50) digestive juice, digests all types of components of food.
 (A) Salivary juice (B) Pancreatic juice (C) Intestinal juice (D) Gastric juice
- (51) Which digestive juice is associated with digestion of milk ?
 (A) Salivary juice (B) Gastric juice (C) Pancreatic juice (D) Bile juice

Answers : (35-C), (36-C), (37-A), (38-C), (39-D), (40-D), (41-D), (42-A), (43-C), (44-B), (45-C), (46-B), (47-C), (48-B), (49-D), (50-C), (51-B)

Digestion :

- The process of biochemical transformation of complex food into a simple form suitable for absorption with the help of digestive enzymes is called digestion.

Digestion in Mouth :

- Saliva : Amylase (ptylin), Water (99.5%) Lysozymes also there.
 Carbohydrates disaccharides
 (Starch) —————> (maltose)
- Lysozyme acts as a anti bacterial substance.

Digestion in stomach :

- Gastric juice : Water (99.45%) , Dilute HCl, Pepsinogen, Renin, Lipase and mucin also there.
- Cells of pyloric stomach secretes gastrin, which induces the secretion of gastric juice.
- Dilute HCl, converts pepsinogen to pepsin, which digests the protein.

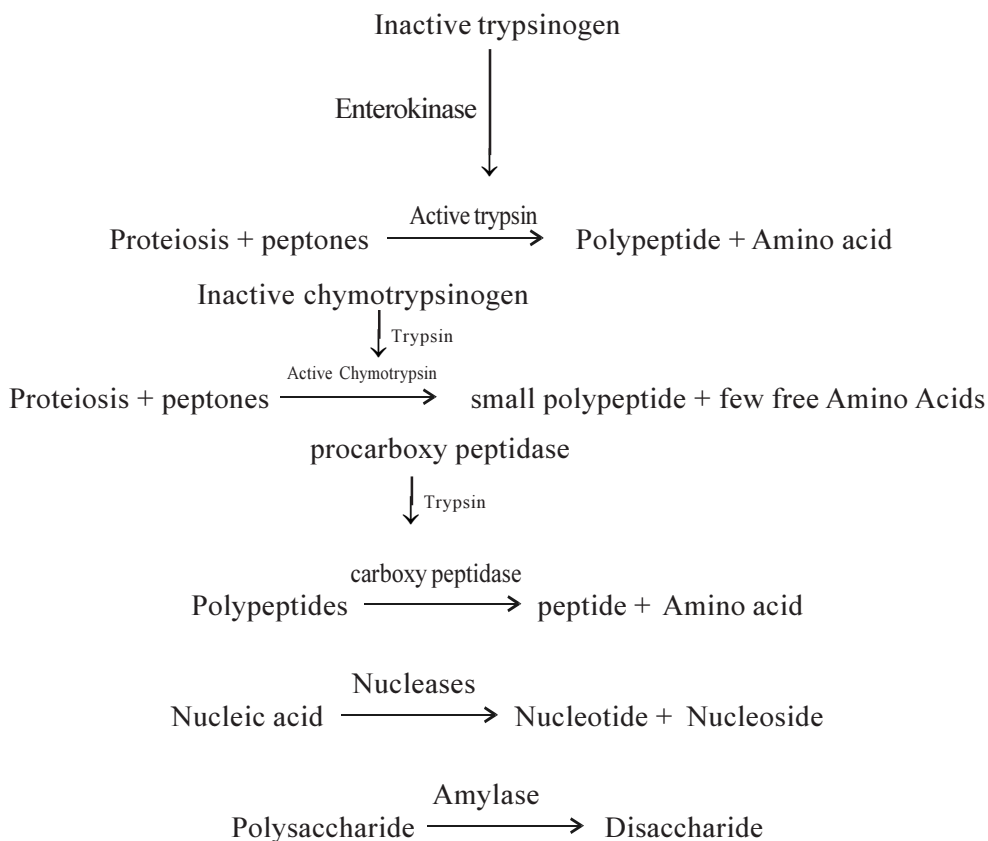
- Protein $\xrightarrow{\text{pepsin}}$ Proteiosis peptones.
- Renin in human babies hydrolyses (a milk protein) into paracasein.
- Lipase catalyses hydrolysis of fats.
- After the digestion in stomach, the acidic food so formed is called chyme.

Digestion in small intestine :

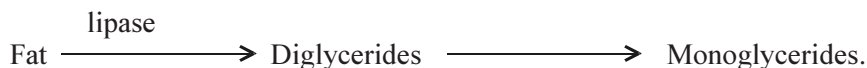
- By the pyloric valve the partially digested chyme enters the small intestine.
- Chyme is digested by bile juice, pancreatic juice and intestinal juice.

Digestion by pancereatic juice :

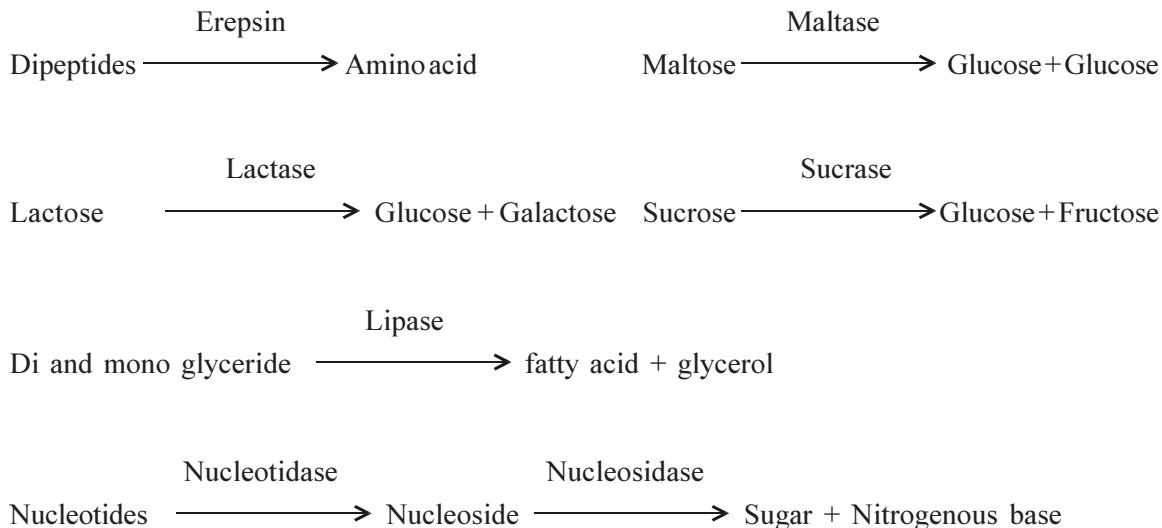
Enterokinase of intestinal juice act on trypsinogen and digestion starts here.



Digestion by bile juice :



Digestion by intestinal juice :



- In small intestine complete digestion can occurs. It is alkaline fluid, which is called chyle.
- Huge Mass of water absorption takes place in large intestine.

Role of Hormones in digestion :

No.	Hormone	Secretory part	Function
1.	Gastrin	Wall of stomach	Stimulates gastric gland to release gastric juice.
2.	Pancreozymin (Pz)	Wall of duodenum	Stimulates pancreas to release pancreatic juice and helps in secretion of intestinal juice.
3.	Secretin	Wall of duodenum	Secretion along with pancreozymin stimulates secretion of pancreatic juice and intestinal juice.
4.	Cholecystokinin (cck)	Wall of Duodenum	Stimulates gall bladder to release bile juice.
5.	Enterogastrone Or gastric inhibitory Peptide (GUP)	Wall of duodenum	Inhibits gastric juice secretion and stops stomach churning.

(52) Ptylin enzyme present in salivary juice is responsible for digestion of

- (A) Carbohydrate (B) Lipid (C) Protein (D) Nucleic acid

(53) Ptylin enzyme of salivary juice acts in which medium ?

- (A) Neutral medium (B) Alkaline medium (C) Acidic medium (D) None of above

- (54) Peristaltic movement is observed in various parts of digestive tract. It is slowest in which organ ?
 (A) Duodenum (B) Rectum (C) Stomach (D) Oesophagus
- (55) Casein present in milk is
 (A) Sugar (B) Protein (C) Lipid (D) Vitamin
- (56) Protein of milk is converted into paracasein by
 (A) Renin (B) Pepsin (C) dil. HCl (D) Trypsin
- (57) Ptyalin in stomach is
 (A) Inactivated by pepsin (B) Inactivated by Renin
 (C) Inactivated by HCl (D) Inactivated by trypsin
- (58) Stomach is the main location for digestion of
 (A) Lipid (B) Carbohydrate (C) Protein (D) all of above
- (59) What is called muscle contraction in digestive tract ?
 (A) Contraction (B) Transportation (C) Relaxation (D) Peristalsis
- (60) Regulation of digestive juice in stomach is by
 (A) Gastrin (B) Enterogastrone (C) A and B both (D) None
- (61) What is function of HCl in Stomach ?
 (A) Enzymes become soluble
 (B) Pepsinogen is activated into pepsin
 (C) Facilitate absorption of food
 (D) Protection of stomach wall
- (62) Which Digestive enzyme functions only in acidic medium ?
 (A) Ptyalin (B) Pepsin (C) Trypsin (D) Amylase
- (63) Digestion of Carbohydrate initiated in which organ ?
 (A) Stomach (B) Intestine (C) Mouth (D) Oesophagus
- (64) Which is different, in given below ? Find out the odd one out.
 (A) Secretin (B) Renin (C) Calcitonin (D) Oxytonin
- (65) Which of the following is stimulated by enterokinase ?
 (A) Pepsin (B) Pepsinogen (C) Trypsin (D) Trypsinogen
- (66) Digestion of lipid is not possible in absence of
 (A) Pigments (B) Bile salts (C) Cholesterol (D) Calcium
- (67) stimulates production of intestinal juice by cells of intestinal wall ?
 (A) Bile juice (B) Gastrin (C) HCl (D) Secretin
- (68) Which enzyme is responsible for the digestion of emulsified lipid ?
 (A) Sucrase (B) Lipase (C) Pepsin (D) Trypsin
- (69) Find the odd one out.
 (A) Glucagon (B) Gastrin (C) Ptyalin (D) Secretin

- (70) Cells of pancreas are not auto digested by its enzymes
 (A) Enzymes are produced only when required.
 (B) Cells are covered by mucous.
 (C) Enzymes are produced in inactive form.
 (D) Enzymes do not have coenzymes.
- (71) Induces contraction of gall bladder :
 (A) Enterogastrone (B) CCK (C) Gastrin (D) Secretin
- (72) Enterokinase is associated with transformation of
 (A) Trypsinogen → trypsin (B) Pepsinogen → pepsin
 (C) Caesin → paracaesin (D) Protein → polysaccharide
- (73) Pyloric valve prevents back flow of food into
 (A) Stomach to oesophagus (B) oesophagus to mouth
 (C) Duodenum to stomach (D) Stomach to duodenum
- (74) Oxyntic cells are present in which part of digestive tract ?
 (A) Ileum (B) Rectum (C) Duodenum (D) Stomach
- (75) Fully digested, liquid alkaline food is
 (A) Chyme (B) Chyle (C) Semidigested (D) Bile juice
- (76) Which biological catalysts are responsible for the digestion of protein ?
 (A) Amylase, pepsin, peptidase
 (B) Enterogastrone, peptidase, pepsin
 (C) Dipeptides, pepsin, protease
 (D) Pepsin, protease, peptidase
- (77) What is responsible for converting polysaccharide into disaccharide ?
 (A) Protease (B) Amylase (C) Invertase (D) Amylose

Answers : (52-A), (53-B), (54-B), (55-B), (56-A), (57-C), (58-C), (59-D), (60-C), (61-B), (62-B), (63-C), (64-B), (65-D), (66-B), (67-D), (68-B), (69-C), (70-C), (71-B), (72-A), (73-C), (74-D), (75-B), (76-D), (77-B)

Absorption and Disorders of Digestive systems

- Complex molecules of food with very high molecular weight and large molecular size so absorption of those can not be possible.
- Active transport, osmosis and diffusion like processes are included in absorption.
- Glucose, several amino acid are absorbed by simple diffusion.
- Some of the amino acid, fructose absorbed Na^+ carrier.
- Water and dissolved substances absorbed by osmotic gradient.
- Fatty acid and bile salts react and form chylomicrons and then are absorbed by lymphatic vessels ● Maximum absorption takes place in small intestine.

DISORDERS OF ALIMENTARY CANAL :

- Starvation and malnutrition causes kwashiorkor.
- Inflammation in gastric portion causes gastritis.
- In acute gastritis, burning sensation is due to food poisoning.
- Due to effect of gastric juice peptic ulcer can occur.

Ulcerative colitis : Ulceration and dilation of colons with passing of watery stools containing blood and mucus.

- When the liver is affected, skin and eyes turn yellow due to the deposition of bile pigments.
- It may be due to the production of too much bile pigments and due to failure of the liver cells to modify or excrete the bile or due to obstruction of the common bile duct.

(78) Amino acid is assimilated in ?

- (A) Wall of rectum (B) Papillae of Ileum
(C) Lymph duct of Ileum (D) Lacteals of Ileum

(79) Completely digested food is mainly absorbed by

- (A) Colon (B) Stomach (C) Small intestine (D) Large intestine

(80) Which components are absorbed by simple diffusion ?

- (A) Disaccharides (B) Monosaccharides
(C) Polysaccharides (D) Protein

(81) Which components are absorbed by process of osmosis ?

- (A) Lipid (B) Protein (C) Water (D) Minerals

(82) Which components are absorbed by lymph vessels ?

- (A) Chyme (B) Chyme granules (C) Pigments (D) Water

(83) What are chyme granules ?

- (A) Granules of chyme (B) Alkaline food with gastric juice
(C) Oil droplets of fatty acids (D) Oil droplets of glycerols

(84) What happens in a gastric disorder ?

- (A) Reduction in digestion (B) Nausea and Vomiting
(C) Increase in digestion (D) Both A and B

(85) Peptic ulcer is formed due to / Peptic ulcer is formed due to :

- (A) Chyme (B) Intestinal juice (C) Gastric juice (D) Saliva

(86) What are symptoms of ulceritis colitis ?

- (A) Ulcers of colon (B) Distention of colon and bleeding
(C) Diarrhoea with mucous (D) All of the above

(87) What are the reasons for vomiting ?

- (A) Motion sickness (B) Mental stress
(C) Poisonous effect in any part of digestive tract (D) all of above

(88) Which organ of digestive tract is affected during jaundice ?

- (A) Gall bladder (B) Liver (C) Pancreas (D) Stomach

Answers : (78-B), (79-C), (80-B), (81-C), (82-B), (83-C), (84-D), (85-C), (86-D), (87-D), (88-B)

A - Assertion, R - Reason.

Choose the correct option :

(A) A and R both are true and R is the correct explanation of A.

(B) A and R both are correct, R is not correct explanation of A.

(C) A is true, but R is false.

(D) A is false, but R is true.

- (89) Statement A : Complex components are converted into simple structural form by various hydrolysing biocatalyst secreted from wall of digestive tract.

Reason R : Complex components are absorbed in their original form.

(A) (B) (C) (D)

- (90) Statement A : Digestion of milk Protein is by pepsin in stomach.

Reason R : Renin converts casein into paracasein in stomach.

(A) (B) (C) (D)

- (91) Statement A : Pancreas is ductless gland.

Reason R : Islets of langerhans secretes insulin and glucagon.

(A) (B) (C) (D)

- (92) Statement A : Bile juice formed in liver does not contain enzymes.

Reason R : Liver plays important role in chemical digestion.

(A) (B) (C) (D)

- (93) Statement A : Enterokinase activates trypsinogen.

Reason R : Enterogastrone inhibits secretion of gastric gland.

(A) (B) (C) (D)

- (94) Statement A : Absorption of fructose is by carrier Na^+ .

Reason R : Absorption of water and minerals takes place in colon.

(A) (B) (C) (D)

- (95) Statement A : Pancreas secretes insulin and glucagon.

Reason R : Protease enzymes are formed in inactive form in pancreas.

(A) (B) (C) (D)

- (96) Statement A : In human, digestion of food begins in oral cavity.

Reason R : In oral cavity, salivary juice containing ptylin is secreted.

(A) (B) (C) (D)

- (97) Statement A : Liver of human is formed of three lobules.

Reason R : Hepatic cells forms bile salts.

(A) (B) (C) (D)

- (98) Statement A : Disaccharides are converted into monosaccharides by erepsin.

Reason R : Lipase converts Di and monoglyceride into fatty acid and glycerol.

(A) (B) (C) (D)

(99) Statement A : Micro organisms and parasites, which have entered through mouth are destroyed in stomach.

Reason R : Gastric juice contain dil HCL.

(A) (B) (C) (D)

(100) Statement A : Glycerol is totally Soluble in water, hence easily absorbed.

Reason R : Chyme is absorbed by lacteals present in papillae.

(A) (B) (C) (D)

Answers : (89-C), (90-D), (91-A), (92-C), (93-B), (94-B), (95-B), (96-A), (97-D), (98-D), (99-A), (100-C)
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True - False (T - F) type questions. Select true or false option in the given statements.

(101) (1) Teeth are embeded in the bones of mandibles.

(2) Oesophagus and trachea opens into larynx.

(3) Human, have diphyodont type of dental arrangement.

(4) Digestive tract starts from anterior cavity, known as oral cavity.

(A) FFTF (B) FFFT (C) TTFF (D) TFTF

(102) (1) Papillae are present in the region of oesophagus.

(2) Colon has ascendings transverse and descending regions.

(3) Carbohydrates are digested in the stomach.

(4) Pancreas has a U shaped structure.

(A) TFTF (B) TTFF (C) FTFT (D) FFTT

(103) (1) Gall bladder secretes bile juice.

(2) Origin of amylase is salivary gland and pancrease.

(3) Valve formed of sphincter muscles are found at the end of pyloric stomach and rectum.

(4) Lysozyme is found in gastric juice.

(A) TFFT (B) FTTF (C) TFTF (D) TTTF

(104) (1) Digestion occurs in large intestine.

(2) Water and mineral ions are absorbed in large intestine.

(3) Faecal formation occurs in large intestine.

(4) Glucose and amino acids are absorbed in large intestine.

(A) TFFT (B) FTFT (C) TTFF (D) FTTF

(105) (1) Dipeptide peptidase amino acid

(1) Dipeptide $\xrightarrow{\text{Peptidase}}$ Amino acid

(2) Pepsinogen HCL pepsin

(2) Pepsinogen $\xrightarrow{\text{HCL}}$ Pepsin

(3) Trypsinogen enterokinin trypsin

(3) Trypsinogen $\xrightarrow{\text{Enterokinin}}$ Trypsin

(4) Monoglyceride, protease, fatty acid and glycerol

(4) Monoglyceride $\xrightarrow{\text{Protease}}$ Fatty acid and glycerol

(A) TFTF (B) TTFF (C) FFFT (D) TTTF

- (106) (1) Caecum, produces intestinal juice.
 (2) In each jaw, 2 types of teeth present in human.
 (3) Malnutrition is reason for Kwashiokar.
 (4) Salivary glands are four in human.
 (A) TTFT (B) FFTT (C) FFTF (D) TTFF
- (107) (1) Lysozyme present in saliva, removes acidity of food.
 (2) Digested food is absorbed in small intestine.
 (3) Liver is biggest chemical factory of body.
 (4) Milk Protein is digested by lipase in stomach.
 (A) FTFT (B) TFTF (C) TFFT (D) FTTF
- (108) (1) Bile juice contains bile salts and bile pigments.
 (2) Glucagon hormone is produced in pancreas.
 (3) Pancreatic juice contain enterokinase co-enzyme.
 (4) Enterogastrone is produced by the wall of duodenum.
 (A) TTFT (B) FFTF (C) TFTF (D) FTTF

Answers : (101-A), (102-C), (103-B), (104-D), (105-B), (106-C), (107-D), (108-A)

- (109) Match column - I and column - II :

Column - I	Column - II
(I) Ptylin	(p) Islets of langerhans (A) (I - r) (II - s) (III - q) (IV - p)
(II) Renin	(q) Wall of duodenum (B) (I - r) (II - q) (III - s) (IV - p)
(III) Insulin	(r) Saliva (C) (I - r) (II - s) (III - p) (IV - q)
(IV) Enterogastrone	(s) Gastric juice (D) (I - r) (II - p) (III - q) (IV - s)

- (110) Match column - I and column - II :

Column - I	Column - II
(I) Intestinal juice	(p) Dil. HCl Present (A) (I - p) (II - s), (III - r) (IV - t)
(II) Pancreatic juice	(q) Contain enterokinase enzyme (B) (I - p) (II - s) (III - t) (IV - r)
(III) Saliva	(r) Do not digest any food substance (C) (I - p) (II - s) (III - r) (IV - q)
(IV) Bile juice	(s) Digest all food substances (D)(I - p) (II - s) (III - q) (IV - t)
	(t) Digest carbohydrate

(111) Match column - I and column - II :

Column - I	Column - II	
(I) Pyloric valve	(p) Secretion of HCL	(A) (I - r) (II - p), (III - q) (IV - s)
(II) Tongue	(q) Secretion of pancreatic juice	(B) (I - r) (II - s) (III - q) (IV - p)
(III) Oxyntic cells	(r) Sphincter muscle	(C) (I - r) (II - q) (III - s) (IV - p)
(IV) Exocrine cells	(s) Papillae	(D) (I - r) (II - s) (III - p) (IV - q)

(112) Match column - I and column - II :

Column - I	Column - II	
(I) Amylase	(p) Intestinal juice	
(II) Billiverdin	(q) Saliva	
(III) Enterokinase	(r) Pancreatic juice	
(IV) Pepsinogen	(s) Gastric juice	
(V) Lysozyme	(t) Bile juice	
(A) (I - r) (II - t), (III - q) (IV - s) (V - p)	(B) (I - r) (II - t) (III - p) (IV - q) (V - s)	
(C) (I - r) (II - t) (III - p) (IV - s) (V - q)	(D) (I - r) (II - t) (III - s) (IV - p) (V - q)	

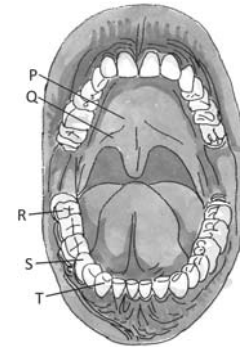


Figure 1

(113) Match column - I and column - II :

Column - I	Column - II	
(I) Peptic ulcer	(p) Ulcers in colon	
(II) Malnutrition	(q) Ulcers in stomach	
(III) Jaundice	(r) Kwashiokar	
(IV) Colitis	(s) Skin and eyes yellow	
(A) (I - q) (II - r), (III - s) (IV - p)	(B) (I - p) (II - q) (III - s) (IV - r)	
(C) (I - q) (II - r) (III - p) (IV - s)	(D) (I - p) (II - q) (III - r) (IV - s)	

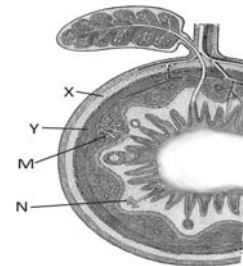


Figure 2

Answers : (109-C), (110-B), (111-D), (112-C), (113-A)

(114) P and Q in given diagram is associated with which structure ?

- | | |
|-------------------------|-----------------|
| (A) Palate | (B) Mandible |
| (C) Papillae / Frenulum | (D) Oral Cavity |

(115) What is correct option for R Shown in diagram I ?

- | | |
|-----------------------|-----------------------------|
| (A) Pre molar | (B) Grows two times in life |
| (C) Incisor / Incisor | (D) Grows only once in life |

(116) What is correct option for S shown in diagram I ?

- | | |
|---------------------------|------------------------|
| (A) Its total number is 4 | (B) Grows once in life |
| (C) Its total number is 8 | (D) B and C Both |

- (117) In the given diagram I what is correct option for 'T' ?
 (A) Its total number is 4. (B) Its total number is 4 pairs.
 (C) It grows only once in life. (D) It is for grinding of food.
- (118) In the given diagram 2, X and Y structure are part of
 (A) Serosa (B) Mucosal layer (C) Muscularis (D) Sub mucosa
- (119) In the given diagram -2 which type of structure is X and Y ?
 (A) Striated muscles (B) Visceral muscles (C) Skeletal muscle (D) Cardiac muscle
- (120) In the given diagram 2 which structure is shown by M ?
 (A) Sub mucosal gland (B) Sub mucosal layer
 (C) Mucosal gland (D) Lymph gland
- (121) Which structure is shown by N in the given diagram 2 ?
 (A) Mucosal layer (B) Circular muscles
 (C) Mucosal gland (D) Sub mucosal gland
- (122) Which type of cells are found in N Structure in diagram 2 ?
 (A) Oxyntic (B) Goblet cells
 (C) Zymogen cells (D) Hepatic cells

Answers : (114-B), (115-D), (116-D), (117-A), (118-C), (119-B), (120-A), (121-C), (122-B)
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Points for PMT - NEET :

- 5-6 year old children do not have premolar.
- In man teeth which are formed only once are 8 premolars and 4 molars.
- In man which are formed twice are 20 in number.
- In man third molar is known as wisdom teeth.
- Largest salivary gland - Parotid gland - opens in the oral cavity through stenson duct.
- Smallest salivary gland - sublingual gland
- Lysosyme is present in saliva as well as tears.
- Shortest digestive organ - pharynx
- In humans daily approximately 1 to 1.5 litre saliva is formed.
- Gastrin hormones secreted by gastrin secretory cells are located in pyloric gland.
- Zymogen cells produce pepsinogen.
- Liver daily produces 600 ml bile juice.
- In gall bladder, bilirubin and biliverdin (yellowish) bile pigments are present.
- In pancreas daily 500 - 800 ml pancreatic juice is secreted.
- Neutral fat containing white fluid transported in lymphatic vessel is called chyle (pyolus)
- Energy needed by body is obtained from the energising components of food. It is measured in calories. It is expressed as K. Cal. or J (Joule) units. 1 Kcal = 1000 callories.
- When 1gm of fod is metabolised the released energy is called its calorific value
- Caloric Value of carbohydrates is 4.1 C.
- Caloric value of protein is 4.65 C
- Caloric value of lipid is 9.45 C.

● **Questions for NEET :**

- (123) Hydrochloric acid is secreted by whom ?
 (A) Goblet cells (B) Chief cells (C) Paneth cells (D) Oxyntic cells
- (124) What is dental formula of 5 to 6 year child ?
 (A) $\frac{2120}{2120}$ (B) $\frac{2012}{2012}$ (C) $\frac{2102}{2102}$ (D) $\frac{2012}{2102}$
- (125) What is dental formula for 16 year boy ?
 (A) $\frac{2123}{2123}$ (B) $\frac{2122}{2122}$ (C) $\frac{2102}{2102}$ (D) $\frac{2023}{2023}$
- (126) Islets of Langerhans
 (A) ductless gland found in pancreas (B) modified lymph gland
 (C) specific region of pituitary gland (D) tubule found in kidney
- (127) Which statement is false for Bile juice ?
 (A) It is important only for digestion of sugar. (B) It is essential for digestion of lipid.
 (C) It is stored in gall bladder. (D) It has bile pigments.
- (128) Where is parotid gland situated ?
 (A) Beneath eye ball (B) Beneath jaw
 (C) Beneath Ear (D) Beneath tongue
- (129) Which specific types of cells present in liver ?
 (A) B- Cells (B) Hepatic Cells (C) Cl- Cells (D) r- Cells
- (130) Bilirubin and Biliverdin are found in
 (A) Saliva (B) Bile juice (C) Pancreatic juice (D) Blood
- (131) What is Hydrolysed by invertase ?
 (A) Sucrose from glucose
 (B) Maltose from starch
 (C) Glucose and fructose from sucrose
 (D) Sucrose from starch
- (132) Trypsin is secreted by
 (A) Liver (B) Pancreas (C) Stomach (D) Duodenum
- (133) In which organ protein is converted into amino acids ?
 (A) Stomach (B) Rectum (C) Oral cavity (D) Intestine
- (134) What are proteolytic enzymes ?
 (A) Amylase, lipase, pepsin
 (B) Steapsin, ptylin, urease
 (C) Trypsin, erepsin, pepsin
 (D) Trypsin, Invertase, ptylin

- (135) Chymotrypsin is
 (A) Vitamin (B) Hormone
 (C) Enzyme for digestion of lipid (D) Enzyme for digestion of protein
- (136) In which organ carbohydrate, protein and lipid is fully digested ?
 (A) Small intestine (B) Liver (C) Stomach (D) Large intestine
- (137) Pancreatic juice plays important role in the digestion of
 (A) Protein and carbohydrate (B) Protein and lipid
 (C) Protein, lipid and carbohydrate (D) Only protein
- (138) Which three secretions mix up in small intestine ?
 (A) Pancreatic juice, bile juice, saliva
 (B) Bile juice, gastric juice, saliva
 (C) Bile juice, pancreatic juice, intestinal juice
 (D) Bile juice, pancreatic juice, gastric juice
- (139) Which of the following is not a digestive enzyme ?
 (A) Enterogastrone (B) Amylase (C) Lipase (D) Trypsin
- (140) Jaundice is disease linked with
 (A) Circulatory system (B) Excretory system (C) Digestive system (D) Skin and eyes

Answers : (123-D), (124-C), (125-A), (126-A), (127-A), (128-C), (129-B), (130-B), (131-C), (132-B), (133-D), (134-C), (135-D), (136-A), (137-C), (138-C), (139-A), (140-C)

