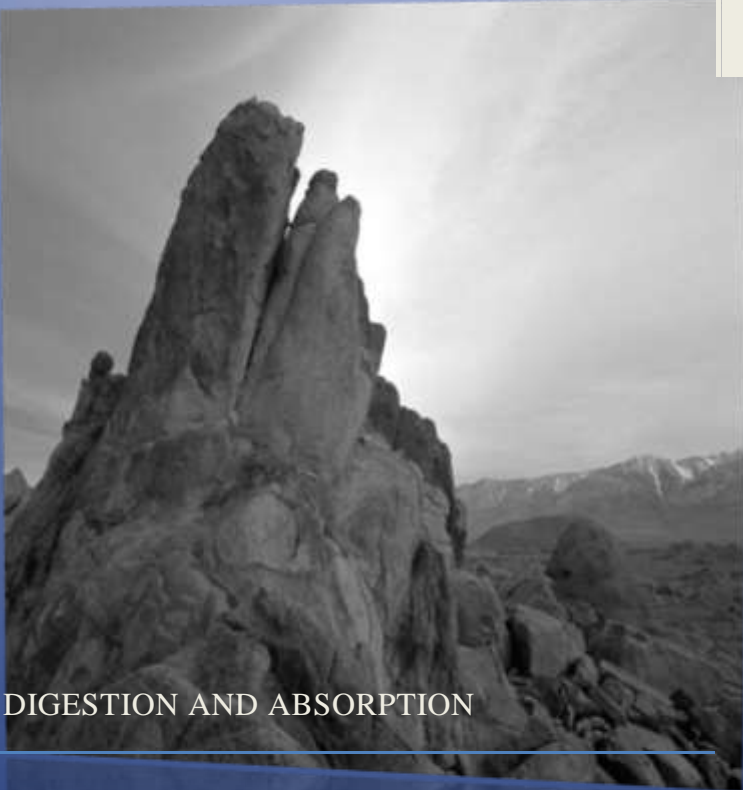


Gneet study



DIGESTION AND ABSORPTION

Topic wise Fact based MCQs for UG NEET exam

Solving fact-based questions in NEET exam preparation aids in strengthening fundamental knowledge, enhancing problem-solving abilities, and improving exam performance. Improves Recall and Retention, Fundamental Understanding

DIGESTION AND ABSORPTION

SET I Q1 to Q14

Q 1: What approach did the reductionist approach in studying life forms result in?

- A) Organismic approach
- B) Reductionistic molecular approach
- C) Physico-chemical approach
- D) Systems biology approach

Q 2: Which field of study became almost synonymous with biochemistry and biophysics during the molecular biology explosion?

- A) Molecular physiology
- B) Systems biology
- C) Organismic biology
- D) Cell biology

Q 3: According to systems biology, how are living phenomena best understood?

- A) Through purely organismic approaches

- B) Through purely reductionistic molecular approaches
- C) Through the interaction among components of the system
- D) Through studying individual cells or tissues

Q 4: What are emergent properties in the context of systems biology?

- A) Properties that arise due to the reductionistic molecular approach
- B) Properties that can only be understood through an organismic approach
- C) Properties that result from the interaction among components of a system
- D) Properties that are unique to molecular biology

Q 5: In the context of major human physiological processes, how are digestion, exchange of gases, blood circulation, locomotion, and movement described?

- A) In terms of cell-free systems

B) In terms of organismic approaches

C) In terms of molecular physiology

D) In terms of systems biology

Q 6: What was the scientific focus of Alfonso Corti's early career?

A) Mammalian auditory system

B) Cardiovascular systems of reptiles

C) Nerve impulses in the cochlea

D) Hair cells in the organ of Corti

Q 7: What is the organ of Corti?

A) A structure on the basilar membrane of the cochlea

B) A structure in the mammalian auditory cortex

C) A group of nerve cells in the reptilian auditory system

D) A sensory organ in the cardiovascular system

Q 8: When did Alfonso Corti publish a paper describing the organ of Corti?

- A) 1822 B) 1851
C) 1888 D) The exact year is unknown

Q 9: In what year did Alfonso Corti pass away?

- A) 1822 B) 1851
C) 1888 D) The exact year is unknown

Q 10: Which of the following are the major components of our food?

- A) Carbohydrates, proteins, and vitamins
B) Proteins, fats, and water
C) Carbohydrates, proteins, and fats
D) Carbohydrates, vitamins, and water

Q11. Why are vitamins and minerals required in small quantities in our diet?

- A) They provide energy for the body

- B) They help in the growth and repair of tissues
- C) They prevent dehydration of the body
- D) They are essential for specific biochemical reactions in the body

Q 12: What role does water play in our body?

- A) It provides energy for metabolic processes
- B) It aids in the growth and repair of tissues
- C) It prevents dehydration of the body
- D) It assists in the digestion of food

Q13: What is the process called when complex food substances are broken down and converted into simple absorbable forms?

- A) Assimilation
- B) Absorption
- C) Digestion
- D) Metabolism

Q 14: How do biomacromolecules in food need to be utilized by our body?

- A) In their original form
- B) Without any breakdown or conversion
- C) After mechanical breakdown only
- D) After being broken down and converted into simple substances

Answers and explanation Q1 to Q14

Q1 C) Physico-chemical approach

Explanation: The reductionist approach to studying life forms resulted in an increasing use of physico-chemical concepts and techniques. This approach focused on understanding biological phenomena by breaking them down into their constituent physical and chemical components.

Q2 A) Molecular physiology

Explanation: During the molecular biology explosion, molecular physiology became almost synonymous with biochemistry and biophysics. The explosion of

knowledge in molecular biology led to a deeper understanding of biological processes at the molecular level.

Q3 C) Through the interaction among components of the system

Explanation: According to systems biology, living phenomena are best understood as emergent properties that arise due to the interaction among components of the system under study. It emphasizes the importance of studying the interactions and relationships between various components, such as molecules, cells, tissues, organisms, populations, and communities, in order to gain a comprehensive understanding of biological processes.

Q4 C) Properties that result from the interaction among components of a system

Explanation: Emergent properties, in the context of systems biology, are properties that arise from the interactions and relationships among the components of

a system. These properties cannot be simply explained by studying the individual components in isolation but require an understanding of the system as a whole.

Q5 C) In terms of molecular physiology

Explanation: The major human physiological processes, such as digestion, exchange of gases, blood circulation, locomotion, and movement, are described in cellular and molecular terms, which falls under the domain of molecular physiology. This approach focuses on understanding these processes at the molecular and cellular level, considering the interactions and mechanisms involved.

Q6 B) Cardiovascular systems of reptiles

Explanation: Alfonso Corti initially studied the cardiovascular systems of reptiles at the beginning of his scientific career. This indicates that he primarily focused on understanding the cardiovascular anatomy and physiology of reptilian species.

Q7: A) A structure on the basilar membrane of the cochlea

Explanation: The organ of Corti is a structure located on the basilar membrane of the cochlea in the mammalian auditory system. It contains specialized hair cells that convert sound vibrations into nerve impulses, playing a crucial role in the process of hearing.

Q 8 B) 1851

Explanation: Alfonso Corti published a paper in 1851, describing the structure he discovered on the basilar membrane of the cochlea, which he named the organ of Corti. This publication marked an important contribution to the understanding of the auditory system.

Q9: C) 1888

Explanation: Alfonso Corti died in the year 1888. After a career focused on studying the cardiovascular systems of reptiles and later the mammalian auditory

system, he left a significant legacy in the field of auditory anatomy and the discovery of the organ of Corti.

Q10: C) Carbohydrates, proteins, and fats

Explanation: The major components of our food are carbohydrates, proteins, and fats. These macronutrients provide the necessary energy and building blocks for our body's growth, repair, and metabolic processes.

Q11: D) They are essential for specific biochemical reactions in the body

Explanation: Vitamins and minerals are required in small quantities in our diet because they play crucial roles in specific biochemical reactions in the body. They act as cofactors, coenzymes, or structural components, supporting various physiological processes and maintaining overall health.

Q12: C) It prevents dehydration of the body

Explanation: Water plays an important role in our body by preventing dehydration. It is essential for maintaining proper hydration levels, supporting various metabolic processes, regulating body temperature, and facilitating the transportation of nutrients and waste products.

Q13: C) Digestion

Explanation: The process of breaking down complex food substances into simple absorbable forms is called digestion. It involves both mechanical and biochemical methods carried out by the digestive system. Digestion allows our body to extract nutrients from food for absorption and utilization.

Q14: D) After being broken down and converted into simple substances

Explanation: Biomacromolecules in food cannot be utilized by our body in their original form. They need to be broken down and converted into simpler substances during the process of digestion. This

breakdown allows the body to absorb and utilize the nutrients efficiently for growth, repair, and energy production.

16.1.1 Alimentary Canal

Set II Q 15 to Q37

Q15) The dental formula for humans is:

- a) 2123 b) 1232 c) 3212 d) 2312

Q16) The thin, long tube extending from the pharynx to the stomach is called:

- a) Oesophagus b) Trachea
c) Duodenum d) Jejunum

Q17) The cartilaginous flap that prevents the entry of food into the windpipe during swallowing is called:

- a) Epiglottis b) Glottis
c) Cardiac sphincter d) Pyloric sphincter

Q18) The 'J'-shaped bag-like structure that follows the oesophagus is the:

- a) Small intestine b) Stomach
- c) Large intestine d) Rectum

Q19) The blind sac hosting symbiotic micro-organisms is called the:

- a) Duodenum b) Caecum
- c) Colon d) Rectum

Q20) The region of the small intestine that follows the duodenum and is highly coiled is called the:

- a) Jejunum b) Ileum
- c) Colon d) Duodenum

Q21) The opening of the stomach into the duodenum is guarded by the:

- a) Pyloric sphincter b) Cardiac sphincter

- c) Epiglottis d) Glottis

Q22) The organ that arises from the caecum and is considered vestigial is the:

- a) Vermiform appendix b) Gallbladder
c) Pancreas d) Appendix

Q23) The hard chewing surface of teeth, made up of enamel, aids in the mastication of food. Enamel is primarily composed of:

- a) Calcium carbonate b) Calcium phosphate
c) Hydroxyapatite d) Sodium chloride

Q24) The muscular organ attached to the floor of the oral cavity by the frenulum is the:

- a) Tongue b) Pharynx
c) Oesophagus d) Stomach

Q25) The region of the alimentary canal where the common passage for food and air is found is the:

- a) Oesophagus b) Pharynx
- c) Stomach d) Small intestine

Q26) The major parts of the stomach include all of the following except:

- a) Cardiac portion b) Fundic region
- c) Body d) Pyloric sphincter

Q27) The region of the small intestine responsible for the absorption of nutrients is the:

- a) Duodenum b) Jejunum
- c) Ileum d) Colon

Q28) The region of the large intestine that follows the descending colon is the:

- a) Ascending colon b) Transverse colon
- c) Sigmoid colon d) Rectum

Q29) The opening at the posterior end of the alimentary canal is called the:

- a) Epiglottis
- b) Pyloric sphincter
- c) Glottis
- d) Anus

Q30) The type of dentition characterized by two sets of teeth during an individual's life is called:

- a) Diphyodont
- b) Heterodont
- c) Deciduous
- d) Thecodont

Q38) The glands found in the stomach and the crypts found between the bases of villi in the intestine are respectively called:

- a) Gastric glands and villi
- b) Crypts of Lieberkuhn and villi
- c) Gastric glands and crypts of Lieberkuhn
- d) Villi and crypts of Lieberkuhn

Q31) Which layer of the alimentary canal is the outermost layer?

- a) Mucosa
- b) Submucosa
- c) Muscularis
- d) Serosa

Q32) The muscularis layer of the alimentary canal is primarily composed of:

- a) Smooth muscles
- b) Skeletal muscles
- c) Cardiac muscles
- d) Striated muscles

Q33) The layer of the alimentary canal that contains nerves, blood vessels, and glands in the duodenum is the:

- a) Mucosa
- b) Submucosa
- c) Muscularis
- d) Serosa

Q34) The layer of the alimentary canal that forms irregular folds (rugae) in the stomach and finger-like foldings called villi in the small intestine is the:

- a) Mucosa b) Submucosa
c) Muscularis d) Serosa

Q35) The cells lining the villi in the small intestine produce numerous microscopic projections called:

- a) Microvilli b) Lacteals
c) Capillaries d) Goblet cells

Q36) The large lymph vessel found within the villi of the small intestine is called the:

- a) Microvilli b) Lacteal
c) Capillary d) Goblet cell

Q37) The mucosal epithelium contains goblet cells that secrete:

- a) Enzymes b) Acid
c) Mucus d) Bile

ANSWER AND EXPLANATION

Answer and Explanation

Set II Q 15 to Q37

Q15 a) 2123

Explanation: The dental formula represents the arrangement of teeth in each half of the upper and lower jaw. The correct dental formula for humans is 2123, which means there are 2 incisors, 1 canine, 2 premolars, and 3 molars on each side of the upper and lower jaws.

Q16 a) Oesophagus

Explanation: The oesophagus is a thin, long tube that connects the pharynx (throat) to the stomach. It serves as a passage for food from the mouth to the stomach.

Q17 a) Epiglottis

Explanation: The epiglottis is a cartilaginous flap located in the pharynx. Its function is to cover the glottis (the opening of the windpipe) during

swallowing, preventing food from entering the respiratory pathway.

Answer: b) Stomach

Q18): The 'J'-shaped bag-like structure that follows the oesophagus is the stomach. It is located in the upper left portion of the abdominal cavity and plays a role in the digestion of food.

Q19 b) Caecum

Explanation: The blind sac that hosts symbiotic microorganisms is called the caecum. It is a small structure located at the beginning of the large intestine and contains beneficial bacteria that aid in the digestion of certain food components.

Q20: b) Ileum

Explanation: The region of the small intestine that follows the duodenum and is highly coiled is called the ileum. It is the longest part of the small intestine and is responsible for the absorption of nutrients.

Q21: a) Pyloric sphincter

Explanation: The opening of the stomach into the duodenum is regulated by a muscular sphincter called the pyloric sphincter. It controls the passage of partially digested food from the stomach into the small intestine.

Q22 a) Vermiform appendix

Explanation: The organ that arises from the caecum and is considered vestigial is the vermiform appendix.

Q23 c) Hydroxyapatite

Enamel, the outermost layer of teeth, is primarily composed of hydroxyapatite, which is a crystalline calcium phosphate compound. It is the hardest substance in the human body and provides protection and strength to teeth.

Q24: a) Tongue

Explanation: The muscular organ attached to the floor of the oral cavity by the frenulum is the tongue. It plays

a crucial role in manipulating food during chewing, swallowing, and speech production.

Q25 b) Pharynx

Explanation: The pharynx is the region of the alimentary canal where the common passage for food and air is found. It is located behind the oral and nasal cavities and serves as a junction between the respiratory and digestive systems.

Q26 d) Pyloric sphincter

Explanation: The pyloric sphincter is not a part of the stomach itself but is a muscular valve located at the opening between the stomach and the first part of the small intestine (duodenum).

Q27 b) Jejunum

Explanation: The jejunum is the middle portion of the small intestine and is primarily responsible for the absorption of nutrients, including carbohydrates, proteins, and fats.

Q28 c) Sigmoid colon

Explanation: The sigmoid colon is the region of the large intestine that follows the descending colon. It is an 'S'-shaped segment located in the lower abdomen before the rectum.

Q29 d) Anus

Explanation: The anus is the posterior opening of the alimentary canal. It is the exit point for undigested food waste (feces) after the completion of the digestive process.

Q30: a) Diphyodont

Explanation: Diphyodont dentition refers to the type of dentition in which an individual develops two sets of teeth during their life. This is the case for the majority of mammals, including humans, who have a set of temporary milk or deciduous teeth that are later replaced by a a set of permanent or adult teeth.

Q31: d) Serosa

Explanation: The outermost layer of the alimentary canal is the serosa. It is made up of a thin mesothelium (epithelium of visceral organs) with some connective tissues. The serosa provides a protective covering for the alimentary canal.

Q32 a) Smooth muscles

Explanation: The muscularis layer of the alimentary canal is primarily composed of smooth muscles. These muscles are usually arranged into an inner circular layer and an outer longitudinal layer. In some regions, an oblique muscle layer may also be present.

Q33: b) Submucosa

Explanation: The submucosal layer of the alimentary canal contains loose connective tissues containing nerves, blood vessels, and glands. In the duodenum, glands are present in the submucosa, which play a role in digestion.

Q34: a) Mucosa

Explanation: The mucosa is the innermost layer lining the lumen of the alimentary canal. It forms irregular folds (rugae) in the stomach and finger-like foldings called villi in the small intestine. These folds and villi increase the surface area for absorption and digestion.

Q35: a) Microvilli

Explanation: The cells lining the villi in the small intestine produce numerous microscopic projections called microvilli. These microvilli give a brush border appearance and further increase the surface area for absorption.

Q36: b) Lacteal

Explanation: The large lymph vessel found within the villi of the small intestine is called the lacteal. It plays a role in absorbing dietary fats and transporting them to the lymphatic system.

Q37: c) Mucus

Explanation: The mucosal epithelium of the alimentary canal contains goblet cells. These cells secrete mucus, a slimy substance that helps in lubrication and protects the lining of the alimentary canal.

Q38: c) Gastric glands and crypts of Lieberkuhn

Explanation: The stomach contains gastric glands, while the crypts found between the bases of villi in the intestine are known as crypts of Lieberkuhn. These structures play roles in secretion and absorption, respectively, in the digestive process.

16.1.2 Digestive Glands

SET III Q 39 to Q46

Q39) Saliva is mainly produced by which of the following salivary glands?

- a) Parotids
- b) Submaxillary/submandibular
- c) Sublinguals

d) All of the above

Q40) Which gland is the largest gland of the body?

a) Parotid gland

b) Submaxillary/submandibular gland

c) Liver

d) Pancreas

Q41) The functional units of the liver are called:

a) Hepatic lobules

b) Pancreatic acini

c) Salivary alveoli

d) Gastric pits

Q42) The bile secreted by the hepatic cells is stored and concentrated in which organ?

a) Liver

b) Pancreas

c) Gallbladder

d) Stomach

Q43) The common hepato-pancreatic duct, which opens into the duodenum, is formed by the union of which ducts?

- a) Hepatic duct and pancreatic duct
- b) Common bile duct and pancreatic duct
- c) Cystic duct and hepatic duct
- d) Parotid duct and sublingual duct

Q44) The exocrine portion of the pancreas secretes:

- a) Hormones
- b) Insulin and glucagon
- c) Pancreatic juice containing enzymes
- d) Bile

Q45) Which of the following glands secretes an alkaline pancreatic juice?

- a) Salivary glands
- b) Liver

- c) Gallbladder d) Pancreas

Q46) The structural and functional units of the liver are known as:

- a) Pancreatic acini b) Gastric pits
c) Hepatic lobules d) Villi

Answer and Explanation

SET III Q39 to Q46

Q47) Which gland secretes bile?

- a) Salivary glands b) Liver
c) Pancreas d) Gallbladder

Q48) The muscular sac that stores and concentrates bile is called the:

- a) Pancreas b) Gallbladder
c) Liver d) Stomach

Q49) The digestive glands associated with the alimentary canal include all of the following except:

- a) Salivary glands
- b) Liver
- c) Pancreas
- d) Stomach

Answer and Explanation

SET III Q 39 to Q46

Q39: d) All of the above

Explanation: Saliva is mainly produced by three pairs of salivary glands: the parotids, the submaxillary/submandibular, and the sublinguals.

These glands are situated just outside the buccal cavity and secrete saliva into the buccal cavity.

Q40: c) Liver

Explanation: The liver is the largest gland of the body, weighing about 1.2 to 1.5 kg in an adult human. It is situated in the abdominal cavity, just below the diaphragm.

Q41: a) Hepatic lobules

Explanation: The hepatic lobules are the structural and functional units of the liver. They contain hepatic cells arranged in the form of cords. Each lobule is covered by a thin connective tissue sheath called the Glisson's capsule.

Q42: c) Gallbladder

Explanation: The bile secreted by the hepatic cells passes through the hepatic ducts and is stored and concentrated in a thin muscular sac called the gallbladder. The gallbladder releases bile into the duodenum as needed for digestion.

Q43: b) Common bile duct and pancreatic duct

Explanation: The common hepato-pancreatic duct, which opens into the duodenum, is formed by the union of the common bile duct (from the liver and gallbladder) and the pancreatic duct (from the

pancreas). This common duct is guarded by a sphincter called the sphincter of Oddi.

Q44: c) Pancreatic juice containing enzymes

Explanation: The exocrine portion of the pancreas secretes an alkaline pancreatic juice containing enzymes. These enzymes play a crucial role in the digestion of carbohydrates, proteins, and fats in the small intestine.

Q45: d) Pancreas

Explanation: The pancreas secretes an alkaline pancreatic juice that helps in neutralizing the acidic chyme coming from the stomach. This alkaline juice contains enzymes that aid in the digestion of carbohydrates, proteins, and fats in the small intestine.

Q46: c) Hepatic lobules

Explanation: The hepatic lobules are the structural and functional units of the liver. They contain hepatic cells arranged in the form of cords and are responsible for

various metabolic functions, including the production of bile.

Q47: b) Liver

Explanation: The liver is responsible for the production and secretion of bile. Bile is a yellowish-green fluid that aids in the digestion and absorption of fats in the small intestine.

Q48: b) Gallbladder

Explanation: The gallbladder is a thin muscular sac that stores and concentrates bile produced by the liver. It releases bile into the duodenum when needed to aid in the digestion of fats.

Q49: d) Stomach

Explanation: The stomach is not considered one of the digestive glands associated with the alimentary canal. However, it does produce gastric juice containing digestive enzymes and acid that play a role in the digestion of proteins. The primary digestive glands

mentioned in the facts are the salivary glands, liver, and pancreas.

16.2 digestion of food

SET IV Q 50 to Q69

Q50) Which of the following is NOT a major function of the buccal cavity?

- a) Mastication of food
- b) Facilitation of swallowing
- c) Production of saliva
- d) Mixing up the food thoroughly

Q51) The process of conveying the bolus into the pharynx and then into the esophagus is known as:

- a) Deglutition
- b) Mastication
- c) Peristalsis
- d) Digestion

Q52) The passage of food from the esophagus into the stomach is controlled by the:

- a) Gastro-oesophageal sphincter
- b) Pyloric sphincter

c) Ileocecal valve

d) Sphincter of Oddi

Q53) Which enzyme present in saliva initiates the chemical process of digestion in the oral cavity?

a) Salivary amylase

b) Pepsin

c) Trypsin

d) Lipase

Q54) Which component of saliva acts as an antibacterial agent?

a) Na^+

b) K^+

c) Lysozyme

d) HCO_3^-

Q55) Which of the following cell types is responsible for secreting mucus in the gastric glands?

a) Parietal cells

b) Peptic cells

c) Mucus neck cells

d) Oxyntic cells

Q56) What is the active enzyme derived from the proenzyme pepsinogen in the stomach?

a) Trypsin

b) Pepsinogenase

c) Renin

d) Pepsin

Q57) Which substance provides the acidic pH optimal for pepsin activity in the stomach?

- a) Mucus
- b) Bicarbonates
- c) Intrinsic factor
- d) Hydrochloric acid

Q58) Which enzyme in the gastric juice of infants helps in the digestion of milk proteins?

- a) Pepsin
- b) Trypsin
- c) Chymotrypsin
- d) Rennin

Q59) Which secretion helps in emulsification of fats in the small intestine?

- a) Pancreatic juice
- b) Bile
- c) Intestinal juice
- d) Gastric juice

Answer and explanation

Q60) Which cells in the intestinal mucosa secrete mucus?

- a) Goblet cells
- b) Brush border cells
- c) Pancreatic cells
- d) Brunner's glands

Q61) What enzymes are present in the intestinal juice or succus entericus?

- a) Proteases
- b) Disaccharidases
- c) Lipases
- d) All of the above

Q62) Which glands in the submucosa of the small intestine help in protecting the mucosal epithelium and maintaining an alkaline medium?

- a) Goblet cells
- b) Brush border cells
- c) Pancreatic cells
- d) Brunner's glands

Q63) Which region of the small intestine is primarily responsible for the breakdown of biomacromolecules?

- a) Duodenum
- b) Jejunum
- c) Ileum
- d) Large intestine

Q64) Where do the final steps of digestion occur in the intestine?

- a) Duodenum
- b) Jejunum
- c) Ileum
- d) Large intestine

Q65) Which enzyme present in the pancreatic juice acts on nucleic acids?

- a) Lipase
- b) Trypsinogen
- c) Nuclease
- d) Pepsin

Q66) Which region of the small intestine is primarily responsible for the absorption of simple substances?

- a) Duodenum
- b) Jejunum
- c) Ileum
- d) Large intestine

Q67) What is the main function of bile in the digestive process?

- a) Emulsification of fats

- b) Activation of lipases
- c) Hydrolysis of carbohydrates
- d) Conversion of proteins into peptides

Q68) Which cells in the gastric glands of the stomach secrete hydrochloric acid?

- a) Mucus neck cells b) Parietal or oxyntic cells
- c) Peptic or chief cells d) Brush border cells

Q69) Which enzyme in the succus entericus acts on dipeptides to break them down into amino acids?

- a) Disaccharidase b) Dipeptidase
- c) Lipase d) Nuclease

SET IV Q 50 to Q69

Q50. c) Production of saliva

Explanation: The buccal cavity, which includes the mouth, teeth, and tongue, performs two major

functions: mastication of food (chewing) and facilitation of swallowing. While saliva is present in the buccal cavity and aids in the process of digestion, its production is not considered a primary function of the buccal cavity itself.

Q51.a) Deglutition

Explanation: Deglutition, or swallowing, is the process of conveying the bolus (masticated food) from the buccal cavity into the pharynx and then into the esophagus. This process involves coordinated movements of muscles in the throat and esophagus.

Q62.a) Gastro-oesophageal sphincter

Explanation: The passage of food from the esophagus into the stomach is controlled by the gastro-oesophageal sphincter. This muscular sphincter regulates the opening of the esophagus into the stomach, preventing the backflow of stomach contents into the esophagus.

Q53. a) Salivary amylase

Explanation: The chemical process of digestion is initiated in the oral cavity by the hydrolytic action of the carbohydrate splitting enzyme, salivary amylase.

Salivary amylase breaks down starch into a disaccharide called maltose.

Q54. c) Lysozyme

Explanation: Lysozyme, an enzyme present in saliva, acts as an antibacterial agent. It helps prevent bacterial infections by breaking down the cell walls of certain bacteria. This function contributes to maintaining oral health.

Q55: c) Mucus neck cells

Explanation: The gastric glands in the stomach have three major types of cells. Mucus neck cells are responsible for secreting mucus, which plays a role in lubrication and protection of the mucosal epithelium.

Q56: d) Pepsin

Explanation: Pepsinogen, secreted by the chief cells in the gastric glands, is converted into the active enzyme called pepsin upon exposure to hydrochloric acid.

Pepsin is the proteolytic enzyme responsible for breaking down proteins into proteoses and peptones.

Q57: d) Hydrochloric acid

Explanation: The parietal or oxyntic cells in the gastric glands secrete hydrochloric acid (HCl) into the stomach. HCl provides the acidic pH (pH 1.8) necessary for the optimal activity of pepsin.

Q58: d) Rennin

Explanation: Rennin is a proteolytic enzyme found in the gastric juice of infants. It aids in the digestion of milk proteins by coagulating the casein protein present in milk.

Q59: b) Bile

Explanation: Bile, released into the duodenum, contains bile pigments, bile salts, cholesterol, and

phospholipids. It helps in the emulsification of fats, breaking them down into very small micelles. Bile also activates lipases, enzymes responsible for the digestion of fats.

Q60: a) Goblet cells

Explanation: Goblet cells are present in the intestinal mucosa and are responsible for secreting mucus. The mucus, along with bicarbonates from the pancreas and secretions from the brush border cells, constitutes the intestinal juice or succus entericus.

Q61: d) All of the above

Explanation: The intestinal juice or succus entericus contains a variety of enzymes, including disaccharidases (e.g., maltase), dipeptidases, lipases, and nucleosidases. These enzymes aid in the further breakdown of nutrients, such as proteins, carbohydrates, fats, and nucleic acids, for absorption.

Q62: d) Brunner's glands

Explanation: Brunner's glands, also known as submucosal glands, are found in the submucosal layer of the duodenum. They secrete mucus and bicarbonates, which help protect the intestinal mucosa from acid and maintain an alkaline medium (pH 7.8) for enzymatic activities.

Q63: a) Duodenum

Explanation: The breakdown of biomacromolecules, such as proteins, carbohydrates, and fats, primarily occurs in the duodenum region of the small intestine. This is where pancreatic enzymes, along with enzymes in the succus entericus, act on these macromolecules to break them down into simpler forms.

Q64: b) Jejunum

Explanation: The final steps in digestion, where the end products of the breakdown reactions are further acted upon to form simple absorbable forms, occur in the jejunum region of the small intestine. The absorbed

nutrients are then transported for utilization by the body.

Q65: c) Nuclease

Explanation: Nucleases are enzymes present in the pancreatic juice that act on nucleic acids, breaking them down into nucleotides and nucleosides. This enzymatic action aids in the digestion of nucleic acids from the ingested food.

Q66: b) Jejunum

Explanation: While all regions of the small intestine contribute to nutrient absorption, the jejunum is primarily responsible for the absorption of simple substances. The jejunum has a highly folded inner surface with numerous villi, which greatly increases the surface area available for absorption.

Q67: a) Emulsification of fats

Explanation: Bile, released into the duodenum, plays a crucial role in the emulsification of fats. It breaks down

large fat globules into smaller droplets, increasing their surface area and facilitating the action of lipases to break down fats into absorbable forms.

Q68: b) Parietal or oxyntic cells

Explanation: Parietal or oxyntic cells are responsible for secreting hydrochloric acid (HCl) in the gastric glands of the stomach. HCl helps maintain an acidic environment in the stomach, aiding in the activation of pepsinogen into pepsin and providing the optimal pH for pepsin's proteolytic activity.

Q69: b) Dipeptidase

Explanation: Dipeptidase is an enzyme present in the succus entericus or intestinal juice that acts on dipeptides, breaking them down into individual amino acids. This enzymatic activity facilitates the absorption of amino acids across the intestinal mucosa.

SETV Q70 to 79

Q70) What is the primary function of the large intestine?

- a) Absorption of nutrients
- b) Digestion of food
- c) Secretion of digestive enzymes
- d) Absorption of water and minerals

Q71) What is the role of mucus secretion in the large intestine?

- a) Facilitation of nutrient absorption
- b) Lubrication of waste particles for easy passage
- c) Activation of digestive enzymes
- d) Protection of intestinal mucosa from acid

Q72) What prevents the backflow of fecal matter from the large intestine into the small intestine?

- a) Pyloric sphincter
- b) Ileo-cecal valve
- c) Gastro-oesophageal sphincter
- d) Sphincter of Oddi

Q73) What controls the secretion of digestive juices in the gastrointestinal tract?

- a) Hormonal control by gastric and intestinal mucosa
- b) Neural signals from the brain
- c) Mechanical stimulation by food presence
- d) Enzymatic activity in the stomach

Q74) Which macronutrient has the highest gross calorific value per gram?

- a) Carbohydrate
- b) Protein
- c) Fat
- d) None of the above

Q75) Which term is used to describe the amount of heat energy required to raise the temperature of 1 gram of water by 1 °C?

- a) Calorie
- b) Joule
- c) Kilocalorie
- d) Kilojoule

Q76) What is the gross calorific value of carbohydrates?

- a) 4.1 kcal/g
- b) 5.65 kcal/g
- c) 9.45 kcal/g
- d) 4.0 kcal/g

Q77) Which term refers to the actual amount of energy obtained from the combustion of 1 gram of food in the body?

- a) Gross calorific value
- b) Physiologic value
- c) Net calorific value
- d) Metabolic value

Q78) What is the physiologic value of protein?

- a) 4.1 kcal/g
- b) 5.65 kcal/g

- c) 9.45 kcal/g d) 4.0 kcal/g

Q79) Which nutrient has the highest physiologic value per gram?

- a) Carbohydrate
b) Protein
c) Fat
d) They have the same physiologic value per gram

Answer and Explanation

SETV Q70 to 79

Q70: d) Absorption of water and minerals

Explanation: The primary function of the large intestine is to absorb water, minerals, and certain drugs from the undigested food material. It plays a crucial role in maintaining proper hydration and electrolyte balance in the body.

Q71: b) Lubrication of waste particles for easy passage

Explanation: Mucus secretion in the large intestine helps in adhering the waste particles together and lubricating them, facilitating their smooth passage through the intestine during defecation.

Q72: b) Ileo-cecal valve

Explanation: The ileo-cecal valve is located between the ileum (end of the small intestine) and the caecum (beginning of the large intestine). It prevents the backflow of fecal matter from the large intestine into the small intestine, ensuring unidirectional flow of waste material.

Q73: a) Hormonal control by gastric and intestinal mucosa

Explanation: The secretion of digestive juices in the gastrointestinal tract is primarily controlled by local hormones produced by the gastric and intestinal mucosa. These hormones are released in response to the presence of food and help regulate the digestive processes.

Q74: c) Fat

Explanation: Among carbohydrates, proteins, and fats, fats have the highest gross calorific value. It means that per gram of fat, more heat energy is released during

complete combustion compared to carbohydrates and proteins.

Q75: a) Calorie

Explanation: A calorie is the unit used to measure the amount of heat energy required to raise the temperature of 1 gram of water by 1 °C. It is commonly used in the context of measuring the energy content of food.

Q76: a) 4.1 kcal/g

Explanation: The gross calorific value of carbohydrates is 4.1 kcal/g. This value represents the amount of heat liberated from the complete combustion of 1 gram of carbohydrates.

Q77: b) Physiologic value

Explanation: The physiologic value of food represents the actual amount of energy obtained from the combustion of 1 gram of food in the body. It takes into account factors such as digestibility and metabolic efficiency.

Q78: d) 4.0 kcal/g

Explanation: The physiologic value of protein is 4.0 kcal/g. This value represents the actual amount of energy obtained from the combustion of 1 gram of

protein in the body, accounting for factors such as digestion and absorption efficiency.

Q79: d) They have the same physiologic value per gram

Explanation: Carbohydrates, proteins, and fats all have the same physiologic value of 4.0 kcal/g per gram. This means that, when metabolized in the body, they provide the same amount of energy per gram.

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