

## **Chapter 03: Digestion, Absorption, and Metabolism**

### **Test Bank**

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#### **MULTIPLE CHOICE**

1. Peristalsis is necessary to make it possible for people to \_\_\_\_\_ food.
  - a. chew
  - b. digest
  - c. swallow
  - d. smell and taste

ANS: C

Peristalsis makes swallowing possible as involuntary movements of circular and longitudinal muscles move food along the esophagus from the mouth to the stomach. Chewing is accomplished by jaw muscles and is not related to peristalsis. Peristalsis helps move food along the gastrointestinal tract to the places where digestion of each nutrient takes place, but does not make digestion itself possible. Smell and taste are not related to peristalsis.

PTS: 1                      DIF: Cognitive Level: Application                      REF: p. 50  
TOP: Nursing Process: Assessment                      MSC: Client Needs: Physiological integrity

2. An example of mechanical digestion includes
  - a. activity of salivary amylase in the mouth.
  - b. churning and mixing of food in the stomach.
  - c. action of bile breaking fats into smaller droplets.
  - d. effects of secretin in stimulating the pancreas to release bicarbonate.

ANS: B

Churning and mixing of food in the stomach is an example of mechanical digestion because it causes physical breakdown of the food. Salivary amylase and secretin are enzymes that cause chemical breakdown of food; bile causes emulsification of the fats.

PTS: 1                      DIF: Cognitive Level: Application                      REF: p. 50  
TOP: Nursing Process: Assessment                      MSC: Client Needs: Physiological integrity

3. Valves to control the movement of food in and out of the stomach are called
  - a. reflux regulators.
  - b. peristalsis muscles.
  - c. sphincter muscles.
  - d. segmentation muscles.

ANS: C

Sphincter muscles control the movement of food in and out of the stomach. They do help prevent reflux, but this is not their name. They are not involved in peristalsis. Segmentation occurs as circular and longitudinal muscles cause food to move backwards and forwards in the gut.

PTS: 1                      DIF: Cognitive Level: Knowledge                      REF: p. 51  
TOP: Nursing Process: Assessment                      MSC: Client Needs: Physiological integrity

4. A substance that works only on a specific class of nutrient is called a(n)

- a. bolus.
- b. chyme.
- c. gastrin.
- d. enzyme.

ANS: D

Enzymes work on specific classes of nutrients to change them from one form to a simpler form. A bolus is a ball-shaped mass of chewed food that is swallowed. Chyme is the semiliquid mixture of food mass and secretions in the stomach. Gastrin is a hormone secreted by the stomach mucosa.

PTS: 1                      DIF: Cognitive Level: Comprehension      REF: p. 52  
TOP: Nursing Process: Assessment                      MSC: Client Needs: Physiological integrity

5. Chemicals that act as messengers are called
- a. proteins.
  - b. hormones.
  - c. enzymes.
  - d. nerve impulses.

ANS: B

Hormones are secreted in one place in the body and have actions in another place in the body; therefore they are a type of chemical messenger. Some, but not all, hormones are proteins. Enzymes work locally on specific classes of nutrients to change them from one form to a simpler form. Nerve impulses send messages in the body, but via electrical impulses rather than via chemicals.

PTS: 1                      DIF: Cognitive Level: Application                      REF: p. 52  
TOP: Nursing Process: Assessment                      MSC: Client Needs: Physiological integrity

6. The action of salivary amylase in the mouth is an example of
- a. chemical digestion.
  - b. chewing.
  - c. mechanical digestion.
  - d. peristalsis and segmentation.

ANS: A

Salivary amylase is an enzyme that chemically digests starch in the mouth. Chewing is an example of mechanical digestion. Peristalsis and segmentation help propel food along the gastrointestinal tract and mix food with intestinal secretions.

PTS: 1                      DIF: Cognitive Level: Comprehension      REF: p. 50  
TOP: Nursing Process: Assessment                      MSC: Client Needs: Physiological integrity

7. Mechanical breakdown of food is a function of the
- a. large intestine.
  - b. liver and pancreas.
  - c. mouth and stomach.
  - d. esophagus and mouth.

ANS: C

Mechanical breakdown of food occurs in the mouth during chewing and in the stomach as the food is mixed by muscular action. By the time food reaches the large intestine it is already broken down and most of the nutrients have been absorbed. The liver and pancreas produce secretions that help with chemical but not mechanical breakdown of food. Food passes through the esophagus largely unchanged so it is not involved in breakdown.

PTS: 1 DIF: Cognitive Level: Application REF: pp. 49-52  
TOP: Nursing Process: Assessment MSC: Client Needs: Physiological integrity

8. A bolus is a ball of
- masticated food ready to be swallowed.
  - fat emulsified with bile and intestinal secretions.
  - mucus that helps move food along the gastrointestinal tract.
  - indigestible fiber mixed with the waste products of digestion.

ANS: A

A bolus is a ball of masticated food mixed with saliva and ready to be swallowed. Emulsified fat and mucus do not form a ball. Indigestible fiber and waste products are known as feces.

PTS: 1 DIF: Cognitive Level: Knowledge REF: p. 50  
TOP: Nursing Process: Assessment MSC: Client Needs: Physiological integrity

9. Gastrin is a(n)
- hormone that allows glucose to enter cells.
  - enzyme that assists protein digestion.
  - hormone needed for reproductive functions.
  - hormone that increases the release of gastric juices.

ANS: D

Gastrin is a hormone that increases the release of gastric juices in response to stomach distension. The hormone that allows glucose to enter cells is insulin. Gastrin is not an enzyme, although it does stimulate secretion of gastric juices that contain enzymes. Gastrin does not have a role in reproductive functions.

PTS: 1 DIF: Cognitive Level: Knowledge REF: p. 52  
TOP: Nursing Process: Assessment MSC: Client Needs: Physiological integrity

10. The small intestine is the major site of
- digestion and denaturation.
  - segmentation and excretion.
  - digestion and absorption.
  - peristalsis and mechanical digestion.

ANS: C

Most digestion and absorption occurs in the small intestine. Denaturation is not part of the digestive process. Segmentation occurs in the small intestine, but not excretion. Peristalsis occurs throughout the digestive tract and mechanical digestion occurs in the mouth and stomach.

PTS: 1 DIF: Cognitive Level: Comprehension REF: p. 53  
TOP: Nursing Process: Assessment MSC: Client Needs: Physiological integrity

11. The villi of the small intestine increase its capacity for
- digestion.
  - absorption.
  - excretion.
  - elimination.

ANS: B

Villi increase the surface area of the small intestine which makes it possible for it to absorb more nutrients. Digestion occurs in the small intestine, but is not a function of the villi. Excretion and elimination do not occur in the small intestine.

PTS: 1 DIF: Cognitive Level: Application REF: p. 53  
TOP: Nursing Process: Assessment MSC: Client Needs: Physiological integrity

12. The absorptive cells of the villi are covered by
- hairlike projections called microvilli.
  - hormones that control digestive processes.
  - enzymes that speed absorption of nutrients.
  - layers of circular and longitudinal muscle.

ANS: A

The villi are covered with microvilli that enhance absorption. Hormones are not found inside the digestive tract. Enzymes cause digestion of food, not absorption. The layers of circular and longitudinal muscle are around the outside of the gastrointestinal tract, not on the inside lining.

PTS: 1 DIF: Cognitive Level: Knowledge REF: p. 53  
TOP: Nursing Process: Assessment MSC: Client Needs: Physiological integrity

13. Secretions of the pancreas neutralize the
- acidic chyme entering the duodenum.
  - acidic chyme leaving the duodenum.
  - bolus flowing down the esophagus.
  - low-density lipoproteins leaving the liver.

ANS: A

Pancreatic secretions contain bicarbonate that decreases the acidity of chyme from the stomach. Acidic chyme enters the duodenum, neutralized chyme leaves the duodenum. The bolus goes down the esophagus but is not acidic until it is mixed with acidic stomach secretions. Low-density lipoproteins leave the liver in the blood stream and are not affected by pancreatic secretions into the intestines.

PTS: 1 DIF: Cognitive Level: Knowledge REF: pp. 51-52  
TOP: Nursing Process: Assessment MSC: Client Needs: Physiological integrity

14. Release of digestive secretions into the small intestine is caused by
- enzymes that are released when food enters the stomach.
  - enzymes that are released when food enters the small intestine.
  - hormones that are released when food enters the stomach.
  - hormones that are released when chyme enters the small intestine.

ANS: D

Hormones that are released when chyme enters the small intestine cause the release of digestive secretions into the small intestine. Hormones control the release of digestive secretions; digestive secretions contain enzymes that digest macronutrients. The hormones that signal release of digestive secretions into the small intestine are triggered when chyme enters the small intestine. If they were released when food entered the stomach, digestive secretions would be released into the small intestine too early and could cause damage.

PTS: 1 DIF: Cognitive Level: Comprehension REF: pp. 52-53  
TOP: Nursing Process: Assessment MSC: Client Needs: Physiological integrity

15. If the large intestine did not carry out its main function, feces would be
- alkaline.
  - acidic.
  - liquid.
  - very dry.

ANS: C

A major function of the large intestine is absorption of water, so feces would be liquid. Feces would not be dry if the large intestine was not removing water. The large intestine does not have a significant impact on the acidity or alkalinity of feces.

PTS: 1 DIF: Cognitive Level: Application REF: p. 54  
TOP: Nursing Process: Assessment MSC: Client Needs: Physiological integrity

16. The esophagus is a structure that
- produces and releases digestive enzymes but not hormones.
  - does not produce digestive enzymes but does release hormones.
  - does not produce or release digestive enzymes or hormones.
  - produces only small amounts of digestive enzymes or hormones.

ANS: C

The esophagus does not produce or release digestive enzymes or hormones. It simply transports food boluses from the mouth to the stomach.

PTS: 1 DIF: Cognitive Level: Comprehension REF: pp. 50-51  
TOP: Nursing Process: Assessment MSC: Client Needs: Physiological integrity

17. The mouth, stomach, small intestine, and colon describe the
- order in which food travels during reverse peristalsis.
  - pathway blood travels after leaving the liver.
  - pathway of hormones that release intestinal secretions.
  - order in which food moves through the gastrointestinal tract.

ANS: D

The mouth, stomach, small intestine, and colon describe the order in which food moves through the gastrointestinal tract. Reverse peristalsis would reverse this order. After it leaves the liver, blood does not flow to these organs in order. Hormones travel in the blood stream, not along the gastrointestinal tract.

PTS: 1 DIF: Cognitive Level: Knowledge REF: p. 49  
TOP: Nursing Process: Assessment MSC: Client Needs: Physiological integrity

18. Facilitated diffusion is a type of absorption that requires a special carrier to transport a molecule across the cell membrane and
- requires energy.
  - does not require energy.
  - is also called pinocytosis.
  - is also called passive diffusion.

ANS: B

Facilitated diffusion allows absorption of molecules into cells from an area of low concentration to an area of high concentration; it uses a carrier protein but does not require energy. In pinocytosis a nutrient or liquid is engulfed by part of the cell membrane and taken into the cell in a vacuole. Passive diffusion does not use a special carrier protein; nutrients pass from an area of high concentration to an area of low concentration.

PTS: 1 DIF: Cognitive Level: Comprehension REF: pp. 54-55  
TOP: Nursing Process: Assessment MSC: Client Needs: Physiological integrity

19. Active transport is
- also called passive diffusion.
  - the diffusion process that requires energy.
  - the absorption process that requires energy.
  - the absorption process that sometimes requires energy.

ANS: C

Active transport is an energy-dependent process for absorbing nutrients. It is not passive because it always requires energy. It is not diffusion because it involves absorption against the concentration gradient.

PTS: 1 DIF: Cognitive Level: Comprehension REF: p. 54  
TOP: Nursing Process: Assessment MSC: Client Needs: Physiological integrity

20. Nutrients are truly inside the body when they are
- swallowed.
  - digested.
  - absorbed.
  - metabolized.

ANS: C

Nutrients need to be absorbed to be truly inside the body. When they are swallowed and even when they are digested, they are inside the gastrointestinal tract, but have not crossed through the walls to enter the body. Metabolism occurs after nutrients are absorbed and part of the body.

PTS: 1 DIF: Cognitive Level: Knowledge REF: p. 54  
TOP: Nursing Process: Assessment MSC: Client Needs: Physiological integrity

21. The bloodstream carries nutrients to the liver soon after absorption because the liver
- produces hormones that regulate blood glucose level.
  - is an important site of metabolism and production of vital substances.
  - is able to determine which substances should be stored and eliminated.
  - has similar functions to the stomach relative to the digestive process.

ANS: B

After absorption, the bloodstream carries nutrients to the liver because it has so many important metabolic functions in the body and so its nutrient needs take priority. Hormones that regulate blood glucose level are produced by the islets of Langerhans in the pancreas. The liver stores some substances and eliminates others, but this is not the primary reason that blood travels there directly from the intestines. The functions of the liver are very different from those of the stomach.

PTS: 1

DIF: Cognitive Level: Knowledge

REF: pp. 54-55

TOP: Nursing Process: Assessment

MSC: Client Needs: Physiological integrity

22. An example of catabolism is
- conversion of glucose to glycogen.
  - the breakdown of glucose to provide energy.
  - the synthesis of protein from amino acids.
  - use of enzymes to digest protein and release amino acids.

ANS: B

Catabolism is the breakdown of food components into small particles, releasing energy as heat and chemical energy. An example of this is the breakdown of glucose to provide energy. Conversion of glucose to glycogen is an example of anabolism, because a smaller substance (glucose) is used to form a larger molecule (glycogen). Synthesis of protein from amino acids is another example of anabolism. Use of enzymes to digest protein is a function of digestion, not related to anabolism and catabolism which are metabolic functions.

PTS: 1

DIF: Cognitive Level: Application

REF: p. 57

TOP: Nursing Process: Assessment

MSC: Client Needs: Physiological integrity

23. Waste products are excreted from the body by the
- lungs, kidneys, and large intestine.
  - liver, kidneys, and pancreas.
  - skin, small intestine, and large intestine.
  - lungs, liver, and spleen.

ANS: A

Waste products are excreted by the lungs (carbon dioxide and water), the kidneys (metabolic waste and excess vitamins and minerals), and the large intestine (in feces). The liver processes metabolic products but does not excrete them. The pancreas, small intestine, skin, and spleen do not play a role in excretion.

PTS: 1

DIF: Cognitive Level: Knowledge

REF: p. 57

TOP: Nursing Process: Assessment

MSC: Client Needs: Physiological integrity

24. A busy and stressed person who eats very few fruits and vegetables and does not take time to exercise is likely to experience
- vomiting.
  - diarrhea.
  - constipation.
  - lactose intolerance.

ANS: C

Busy lifestyles, stress that causes muscle tension, lack of exercise to maintain tone in gastrointestinal muscles, and lack of dietary fiber (from fruits and vegetables and whole grains) are likely to result in constipation. Diarrhea may be caused by stress, but not by lack of fruits and vegetables or lack of exercise. Vomiting is caused by motion sickness or by ingestion of a virus or toxin. Lactose intolerance is caused by an inability to digest lactose, the sugar in milk.

PTS: 1 DIF: Cognitive Level: Application REF: p. 59  
TOP: Nursing Process: Assessment MSC: Client Needs: Physiological integrity

25. Dehydration may occur after
- vomiting and diarrhea.
  - constipation and heartburn.
  - esophagitis and anemia.
  - gastroesophageal reflux and hiatal hernia.

ANS: A

Vomiting and diarrhea both cause abnormal loss of fluid which can lead to dehydration. Constipation, heartburn, esophagitis, anemia, gastroesophageal reflux, and hiatal hernia do not influence hydration status.

PTS: 1 DIF: Cognitive Level: Application REF: pp. 58-60  
TOP: Nursing Process: Assessment MSC: Client Needs: Physiological integrity

26. A person that complains that they have problems with gas, bloating, and diarrhea if they eat breakfast cereal with milk but not if they eat pancakes or waffles, may have
- milk allergy.
  - gluten intolerance.
  - irritable bowel syndrome.
  - lactose intolerance.

ANS: D

These symptoms are likely to be caused by lactose intolerance. Patients with lactose intolerance cannot digest lactose, the sugar in milk, so it ferments in the intestines causing gas, bloating, and diarrhea. Milk allergy may also cause diarrhea, but would probably also cause skin rash and/or asthma. Gluten intolerance would not be affected by milk intake. Irritable bowel syndrome would probably not produce symptoms after eating foods with milk but not after eating foods without milk.

PTS: 1 DIF: Cognitive Level: Application REF: p. 59  
TOP: Nursing Process: Diagnosis MSC: Client Needs: Physiological integrity

27. The adjectives “mechanical” and “chemical” describe two
- actions needed to cook food.
  - ways to move substances in the body.
  - types of action that result in digestion.
  - ways molecules are transported into and out of cells.

ANS: C



Mechanical and chemical describe two types of action that take place in digestion. These adjectives describe processes that may be used to cook food, but are not needed to do so. Substances are moved in the body and into and out of cells by mechanical and chemical means, but these adjectives are not generally used for these processes.

PTS: 1 DIF: Cognitive Level: Knowledge REF: pp. 49-50  
TOP: Nursing Process: Assessment MSC: Client Needs: Physiological integrity

28. The esophagus is the
- muscular tube used for excretion of waste products.
  - pathway through which enzymes and hormones travel.
  - pathway that blood follows within the body from organ to organ.
  - muscular tube along which a food bolus travels from the mouth to the stomach.

ANS: D

The esophagus is the tube that carries a food bolus from the mouth to the stomach. Waste products are excreted from the rectum, the kidneys, and the lungs. Blood, enzymes, and hormones do not follow such a specific pathway in the body.

PTS: 1 DIF: Cognitive Level: Knowledge REF: pp. 50-51  
TOP: Nursing Process: Assessment MSC: Client Needs: Physiological integrity

29. Metabolism is the process by which
- absorbed nutrients are used to break down body structures.
  - absorbed nutrients are used to break down and maintain body structures and functions.
  - excreted nutrients are used by the body for energy and to form and maintain body structures and functions.
  - absorbed nutrients are used by the body for energy and to form and maintain body structures and functions.

ANS: D

Metabolism is the process by which absorbed nutrients are used by the body for energy and to form and maintain body structures and functions. Absorbed nutrients are used to maintain body structures and functions, but not to break down body structures. Excreted nutrients are not available to be used by the body.

PTS: 1 DIF: Cognitive Level: Comprehension REF: p. 57  
TOP: Nursing Process: Assessment MSC: Client Needs: Physiological integrity

30. Vomiting is
- reverse peristalsis.
  - forward peristalsis.
  - an eating disorder.
  - gastroesophageal reflux.

ANS: A

Vomiting is reverse peristalsis. Instead of food moving down the GI tract, the peristalsis muscles move the contents of the stomach back through the esophagus and forcefully out the mouth. Forward peristalsis would cause food to continue through the gastrointestinal tract. Vomiting is usually involuntary and not connected with an eating disorder. Gastroesophageal reflux causes food from the stomach to back up into the esophagus, but is less intense than vomiting.

PTS: 1

DIF: Cognitive Level: Comprehension

REF: pp. 58-59

TOP: Nursing Process: Assessment

MSC: Client Needs: Physiological integrity