

Review Questions for Digestive Histology topic

Review questions will not be collected and are not worth any points. Doing them will, however, help you prepare for the midterms and quizzes in this course. Furthermore, some of these review questions will appear on the final exam (although the numbers within the questions may be changed).

1) Chyme

- A) A digestive juice made by the gall bladder
- B) Vomit
- C) Swallowed food
- D) A digestive process that tears food apart by smooth muscle contraction

2) The continuous tube, from mouth to anus, the chyme passes through is the

- A) Rumen
- B) Esophagus
- C) Nutrial-digestive canal
- D) Gastrointestinal tract

3) Which is not a function of the digestive system?

- A) Breaking down food into monomers
- B) Food intake
- C) Eliminating solid wastes as feces
- D) Eliminating liquid wastes as urine
- E) Absorbing nutrients into body

4) Most of the major digestive system organs are located in the

- A) Stomach
- B) Abdominal cavity
- C) Thoracic cavity
- D) Pancreas

5) Which of the following is part of the digestive system, but not part of the gastrointestinal tract?

- A) liver
- B) stomach
- C) large intestine
- D) small intestine

- 6) Which of the following is an accessory organ of the digestive system?
- A) pancreas
 - B) small intestine
 - C) stomach
 - D) large intestine
- 7) Which is not a tissue layer of the GI tract?
- A) Mucosa
 - B) Peritoneum
 - C) Submucosa
 - D) Cartilage lamina
 - E) Muscularis externa
- 8) The inner circular and outer longitudinal layers are the two parts of the ____ layer of the digestive tract.
- A) lumen
 - B) muscularis mucosa
 - C) submucosa
 - D) muscularis externa
- 9) The _____ is the inner layer of the gastrointestinal tract that functions in absorption and secretion.
- A) muscularis
 - B) serosa
 - C) submucosa
 - D) mucosa
- 10) Oral cavity
- A) The mouth
 - B) A cartilage flap that prevents acids from exiting the stomach
 - C) The upper part of the throat
 - D) Indigestible solids in foods
- 11) Pharynx
- A) The nasal cavity
 - B) A cartilage flap that prevents acids from exiting the stomach
 - C) The upper part of the throat
 - D) Indigestible solids in foods

12) Esophagus

- A) The tube that carries chyme to the stomach
- B) The upper throat
- C) Mucus that protects the digestive organs from their own acids
- D) The large intestine

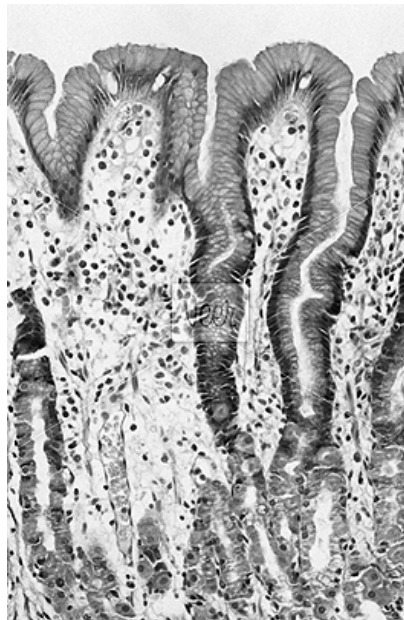
13) In laboratory, you viewed the digestive system organ shown on the right with the microscope. Name the organ. Hint: Note the deep inward folds of the mucosa with many white goblet cells.

- A) Stomach
- B) Small Intestine
- C) Large intestine
- D) Esophagus



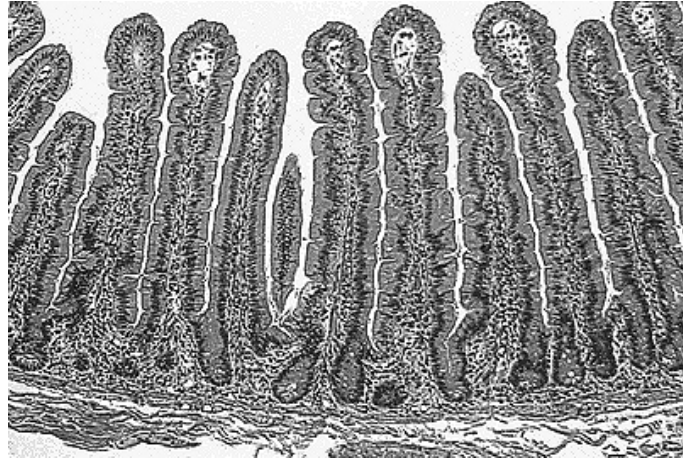
14) In laboratory, you viewed the digestive system organ shown on the right with the microscope. Name the organ. Hint: Note the deep inward folds of the mucosa with few white goblet cells.

- A) Stomach
- B) Small Intestine
- C) Large intestine
- D) Pancreas



15) In laboratory, you viewed the digestive system organ shown on the right with the microscope. Name the organ. Hint: Note the finger-like folds of the mucosa.

- A) Stomach
- B) Small Intestine
- C) Large intestine
- D) Gall bladder



16) Which best describes the stomach's function?

- A) Churning only (no digestion)
- B) Absorbs the most nutrients and water
- C) Stores digestive juice but does not contact the chyme directly
- D) Digestion of chyme but very little absorption of nutrients

17) The acids in the stomach do not splash into the esophagus because of the

- A) esophageal sphincter.
- B) epiglottis.
- C) trachea.
- D) glottis.

18) These cells secrete hydrochloric acid in the stomach.

- A) parietal cells
- B) chief cells
- C) goblet cells
- D) rugal cells

19) Rugae

- A) The folds in the stomach mucosa
- B) Sugar-rich foods that are digested first by the GI tract
- C) A detergent-like substance used for fat digestion
- D) Smooth muscle contractions to mash chyme

20) The digestive system organ where the most digestion and most absorption occurs is the

- A) Stomach
- B) Large intestine
- C) Small intestine
- D) Pancreas

21) To enter the small intestine, partially digested food must pass through the

- A) esophageal sphincter.
- B) pyloric sphincter.
- C) ileocecal valve.
- D) anal sphincter

22) Which is **not** a section of the small intestine?

- A) Ileum
- B) Pylorus
- C) Jejunum
- D) Duodenum

23) The small intestine has many folds to increase its surface area. Which of the following is **not** a tissue or cell membrane fold of the small intestine?

- A) villi.
- B) microvilli.
- C) ruga.
- D) plicae circulares.

24) Which is the correct order of regions of the small intestine?

- A) duodenum, jejunum, ileum
- B) jejunum, duodenum, ileum
- C) ileum, duodenum, jejunum
- D) jejunum, ileum, duodenum

25) The large intestine's function is best described as

- A) Final water and ion absorption but no digestion
- B) Digestion of macromolecules only
- C) Digestion of fats only
- D) Storage of nutrients between meals

- 26) The large intestine is also known as the
- A) Colon
 - B) GI tract
 - C) Accessory organ
 - D) Plicae circularis
- 27) Which is **not** a region of the large intestine?
- A) Ascending colon
 - B) Descending colon
 - C) Sigmoidal colon
 - D) Lateral colon
 - E) Transverse colon
- 28) The region of the GI tract that houses the largest bacteria population
- A) Mouth
 - B) Bladder
 - C) Large intestine
 - D) Stomach
- 29) The feces sometimes becomes hypertonic. This is usually due to large amounts of salts, undigested lactose, fiber, or other solutes in the feces. When the feces becomes hypertonic, this tends to cause...
- A) acid reflux
 - B) pyloricstenosis
 - C) diarrhea
 - D) ulcers
- 30) Organs that make digestive juices but that do not contact the chyme are called
- A) Gastrointestinal tract organs
 - B) Alimentary canal organs
 - C) Accessory organs
 - D) Chymogen organs
- 31) All accessory organs secrete their digestive juices into the _____ (a region of the GI tract).
- A) Stomach
 - B) Duodenum
 - C) Large Intestine
 - D) Liver

- 32) The accessory organ that makes the most digestive enzymes is the...
- A) Liver
 - B) Gall bladder
 - C) Pancreas
 - D) Small intestine
- 33) Which organ makes a buffer to neutralize the acidic chyme entering the small intestine from the stomach?
- A) Stomach
 - B) Small intestine
 - C) Liver
 - D) Pancreas
- 34) The gall bladder stores
- A) Bile
 - B) Acids
 - C) Bases
 - D) Fats
- 35) The function of bile is to...
- A) Neutralize stomach acids
 - B) Break down fat globules
 - C) Control bacterial growth in the lower GI tract
 - D) Lubricate the passage of chyme
- 36) Pebble-like pieces of solid bile that can cause irritation to the digestive system are known as
- A) Kidney stones
 - B) Gall stones
 - C) Plaques
 - D) Bile masses
- 37) Bile is manufactured in which organ?
- A) The stomach
 - B) The gall bladder
 - C) The duodenum
 - D) The liver

38) High levels of bile in the blood (as might occur when a person has a liver disease) causes

- A) diabetes mellitus.
- B) gallstones.
- C) jaundice.
- D) diabetes insipidus.

39) The blood vessel that carries nutrient-rich blood directly from the GI tract to the liver is the

- A) Hepatic portal vein
- B) Renal artery
- C) Aorta
- D) Alimentary canal

40) The structures within the pancreas that release hormones are called

- A) Parathyroid glands
- B) Pancreatic islets
- C) Pancreatic ducts
- D) Diabetae ducts

41) Carbohydrates, proteins, lipids, and nucleic acids are known as the four _____.

42) Carbohydrates, proteins, nucleic acids, and lipids are all _____, meaning that they are large molecules composed of many smaller molecules linked together. The smaller molecules that are the building blocks of carbohydrates, proteins, nucleic acids, and lipids are called _____.

43) _____ means breaking things down into smaller pieces, such as when macromolecules in foods are broken down into monomers.

44) There are two types of digestion: _____ digestion and _____ digestion.

45) Chemical digestion is when _____ break apart chyme, such as when digestive juices (acids, enzymes, and bile) are mixed with the swallowed food. Mechanical digestion is when _____ break apart the chyme (such as when food is chewed).

46) Although acid and bile play important roles in chemical digestion, the most active molecules made by the digestive system for chemical digestion are proteins called digestive _____.

47) The major digestive system organs are all located in the _____ body cavity.

48) After being swallowed, food becomes known as _____. The swallowed food passes through the _____, which is a tube that runs from mouth to anus. This tube is also known as the _____.

49) Smooth muscles in the gastrointestinal tract are responsible for propelling chyme from mouth to anus. This process is called _____.

50) In addition to propelling chyme through the GI tract, the smooth muscles in the gastrointestinal tract are also responsible for _____ (name their other function).

51) The digestive system organs fall into two major groups: the _____ and the _____.

52) The _____, _____, and _____ are the three major GI tract organs. The _____, _____, and _____ are the three major accessory organs.

53) The chyme does/doesn't (circle one) pass through the accessory organs.

54) What is the function of the accessory organs? _____.

55) The central hollow area inside the gastrointestinal tract, where the chyme passes through, is called the _____. This same term that is used to describe the hollow region in many other tubular organs, such as blood vessels.

56) The wall of the GI tract has four major tissue layers. From the lumen outward, the first three are the _____, _____, and the _____.

57) The _____ layer of the gastrointestinal tract is lined with simple columnar epithelial cells. Its two major functions are _____ and _____.

58) Most blood vessels and nerve fibers of the GI tract are found in the _____ tissue layer of the GI tract. This layer is made of _____ tissue.

59) The GI tract has a tissue layer of smooth muscle.

a) What is this layer called? _____

b) What are the two functions of this layer?

60) The inner layer of the muscularis externa consists of smooth muscle cells which are oriented in a circle around the lumen and are therefore called the _____ layer of the muscularis externa. This layer is primarily responsible for _____. The outer layer of the muscularis externa has muscle cells oriented up and down the GI tract and are therefore called the _____ layer of the muscularis externa. It is responsible for _____.

61) The organs of the digestive system which are found in the abdominal cavity are surrounded and cushioned by a fluid-filled membrane called the _____.

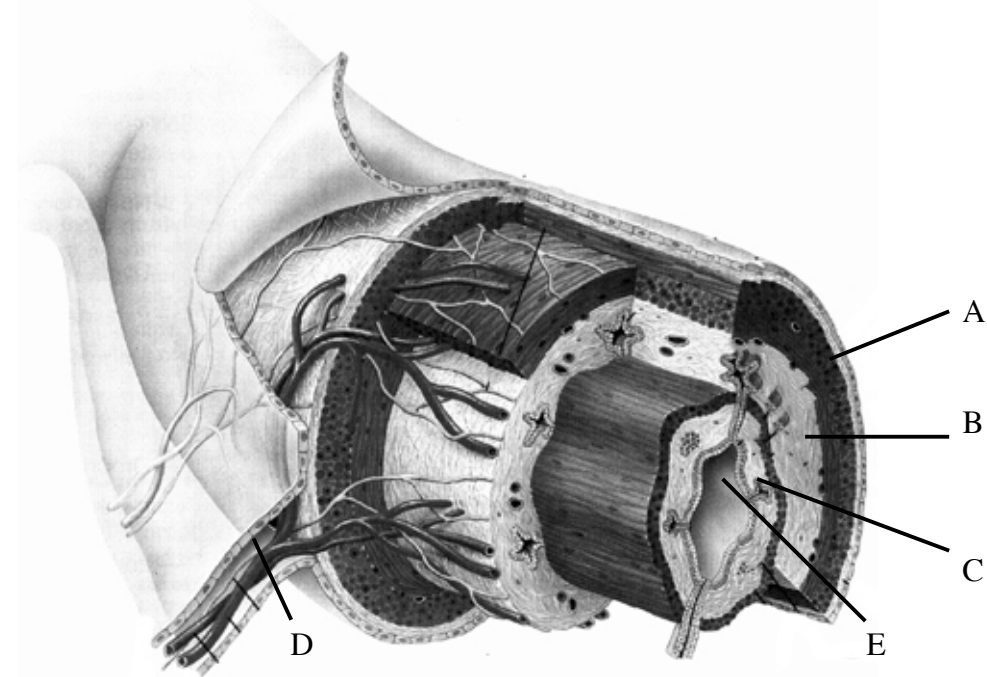
62) The first section of the GI tract is the oral cavity. After the food in the oral cavity is swallowed, the next section of the GI tract that it moves through is the _____. The _____ is the next section of the GI tract after the pharynx. It is posterior to the trachea (the windpipe). Chyme and beverages do not enter the trachea because the _____, a cartilage flap, blocks the trachea when we swallow.

63) Which alimentary canal organ carries chyme downward through the thoracic cavity, into the abdominal cavity? _____.

64) In certain regions of the GI tract, the muscles of the muscularis externa form doughnut shaped rings called _____. These act as valves. They can close to prevent movement of chyme through the tract.

65) As chyme reaches the bottom of the esophagus, the _____ sphincter opens. It controls the entrance of chyme into the _____ (an organ).

66) A cross section of the GI tract is shown below. After each letter below the drawing, give each part's name, its major tissue type, and its function. (For part E, just give its name and function).



A: *Hint: Churns chyme, does peristalsis*

B: *Hint: Contains blood vessels and nerves*

C: *Hint: Innermost tissue layer*

D: *Hint: Cushions the GI tract*

E: *Hint: The hollow space inside GI tract*

67) The interior of the empty stomach is extremely wrinkled: these wrinkles, or folds, are called _____. These folds increase surface area and allow the stomach to expand and stretch when storing food or drink.

68) The stomach's digestive juice (acid and digestive enzymes) is secreted into the lumen of the stomach from microscopic **inward** folds of its mucosa. Each inward fold is called a _____. All the cells that line each inward fold are together are called a _____.

69) List the two major cells types found in gastric glands and name what each of the two cell types secretes:

70) Unlike the muscularis externa in other regions of the GI tract, the muscularis externa of the stomach has _____ (a number) of layers

71) When the esophageal sphincter does not fully close, a disorder called _____ occurs.

72) Describe the tissue type, location, and function of the pyloric sphincter:

73) After several hours of digestion in the stomach, the _____ sphincter will open to allow passage of chyme out of the stomach and into the _____ (an organ).

74) The most digestion and absorption in the GI tract takes place in the _____ (an organ).

75) The small intestine is divided into three sections. Write the names of the three sections in the blanks below. List them in their correct order.

Circle the one where the most digestion and absorption takes place.

Put a star next to the one where the digestive juices from the accessory glands enter the small intestine.

Put a box around the one that contacts the ileocecal valve.

Draw a triangle next to the one that begins with the pyloric sphincter.

76) The mucosa of the small intestine is very folded to increase its surface area. There are three types and sizes of folds: The largest folds are visible to the naked eye. They are called _____.

77) In addition to the plicae circularis folds in the small intestine, there are smaller finger-like projections called _____. These are easily seen using a microscope set at low magnification.

78) The smallest folds in the small intestine are folds of the plasma membranes of the _____ cells of the small intestine mucosa. These folds are called _____ and are so small that they can only be seen using a microscope set at high magnification.

79) Because of all the folding of the small intestine's mucosa layer, it looks a little like the hairs of a brush. For that reason, the small intestine mucosa is sometimes called the _____.

80) The passage of chyme from the small intestine into the large intestine is controlled by the _____ sphincter.

81) Another name for the large intestine is the _____.

82) The major function of the large intestine is absorption of _____ and _____.

83) The inward folds of the large intestine mucosa are called _____. The function of these inward folds is _____.

84) Once chyme has entered the large intestine it is now referred to as _____.

85) The large intestine has many white colored cells called _____ cells, which make mucus. The mucus lubricates the passage of feces.

86) The large intestine is divided into four regions, the _____ on the right side of the abdomen, the _____ which crosses the abdomen from right to left, the _____ on the left side of the abdomen, and the _____ which is the final region before the anus.

87) The _____ is a tiny pouch-like organ, roughly the size of one's index finger, that is part of the ascending colon.

88) The physiological term for elimination of feces from the gastrointestinal tract is _____.

89) Bacteria are mostly found in the _____ organ of the digestive system.

90) Overly rapid transit of feces through the large intestine does not allow time for water resorption; the result is _____.

91) The organs and passage ways of the gastrointestinal tract, taken in order, after the mouth, include the _____, _____, _____, _____ and _____, which ends with the anus.

92) Match the descriptions on the right with the alimentary canal organs on the left. Some descriptions may match more than one organ. Write the letters of all matching descriptions.

Stomach: _____

a) The pyloric sphincter separates it from another organ

b) Most digestion and absorption take place here

c) Has gastric pits

Small intestine: _____

d) The longest organ of the alimentary canal

e) Contains folds called villi

f) The appendix is located at its beginning

Large intestine: _____

g) Contains many bacteria

93) The pancreas is a long, roughly triangular organ located just inferior to the _____ (a GI tract organ).

94) One major function of the pancreas is to make several different _____ (a type of protein), which become mixed with the chyme.

95) Another major function of the pancreas is to make a(n) _____ which is needed because of the high acidity of the chyme that leaves the stomach. This substance takes away the acidity of acids, so we say it “_____”the acids in the chyme.

96) Where does the buffer in pancreatic juice carry out its function?

97) Name all the components of pancreatic juice that we discussed in class. ,

98) The digestive juices of the pancreas are secreted into the _____ region of the _____ (an organ).

99) The pancreas contains exocrine glands and endocrine glands. Define the term “exocrine gland” as it was defined in class. Define the term in general, not in a way that is specific to the pancreas.

100) Define the term “endocrine gland” as it was defined in class. Define the term in general, not in a way that is specific to the pancreas.

101) The specific name for the cells of the pancreas’ exocrine glands is _____ cells. The exocrine glands themselves are called _____.

102) The secretions from the exocrine glands of the pancreas enter into the _____ (a GI tract organ).

103) The endocrine glands of the pancreas have two cell types: _____ cells which secrete _____, and _____ cells which secrete _____.

104) The clusters of hormone secreting cells within the pancreas are called _____ or _____.

105) The hormones that are secreted from the endocrine glands of the pancreas are secreted into the _____.

106) In the blank space after each digestive system structure on the left, write the letters of all descriptions on the right that match it. Some descriptions may match more than one structure. Write the letters of all matching descriptions.

Small intestine: _____ a) Located in the thoracic cavity

Stomach: _____ b) Part of the alimentary canal

Esophagus: _____ c) A fluid filled membrane

Peritoneum _____ d) An accessory organ

Pancreas _____ e) Has a sphincter at its entrance

107) The gallbladder stores _____ .

108) The liver is mostly on the patient's left/right (circle one) side of the abdominal cavity.

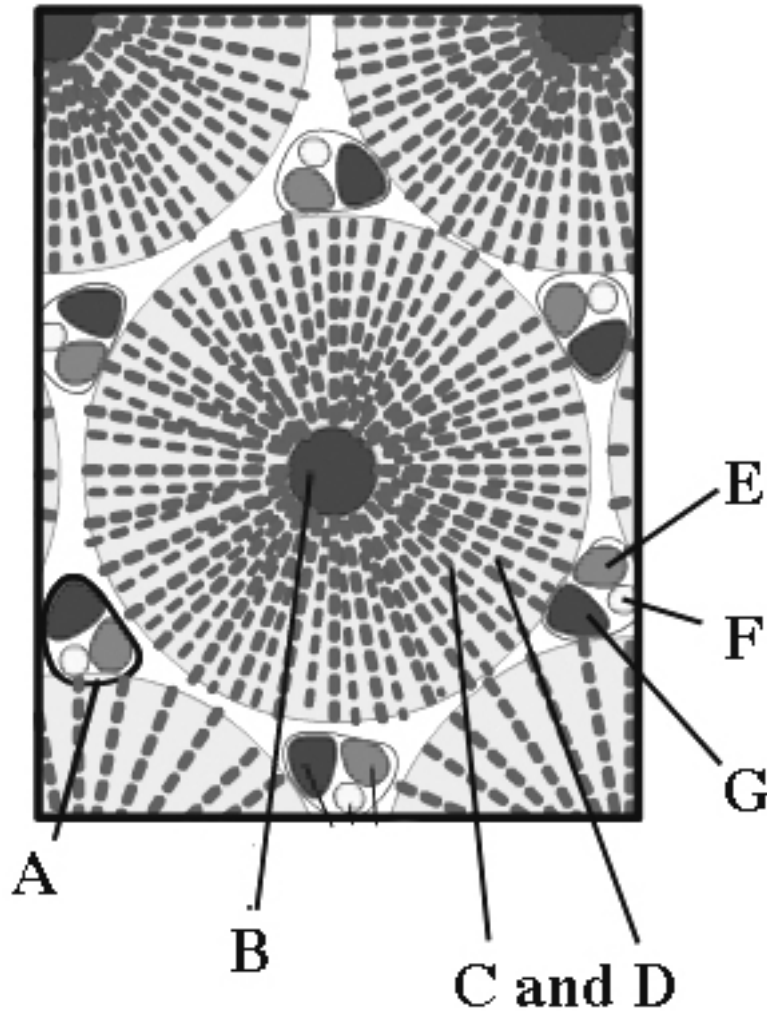
109) _____ is the digestive juice that is produced by the liver. This digestive juice's function is to _____.

110) In addition to making bile, another function of the liver is to store _____ (a nutrient monomer) in the form of a macromolecule called _____.

111) Nutrient-rich blood is transported from the GI tract to the liver in a large vessel known as the _____.

112) Describe the microscopic anatomy of the liver. Your description should include the names of the major structures that you see under the microscope and the function of each of the units.

113) The diagram below shows the microscopic anatomy of a liver lobule. Name parts A – G.



- A) = _____ (hint: it is vessels E, F, and G together)
 B) = _____
 C) = _____ (hint: C and D are the two types of vessels between
 D) = _____ structures A and B)
 E) = _____ (hint: It carries nutrient-rich blood)
 F) = _____ (hint: It carries bile)
 G) = _____ (hint: It carries normal blood)

114) Certain types of liver disease can cause bile pigments to enter the blood, causing a yellow skin color. This skin discoloration is called _____.

115) Below is a partial list of digestive system structures. Write an A in the blank next to all parts that are accessory organs. Write a G in the blank for all that are parts of the GI tract. Also write a number in the blank next to all GI tract parts to indicate the correct order that chyme passes through them.

Large intestine: _____
Oral cavity _____
Stomach _____
Esophageal sphincter _____
Pancreas _____
Duodenum _____
Liver _____
Gall bladder _____

Note: The review questions in this handout include only a few photographs of digestive organs for you to practice visual organ identification. On exams and quizzes, however, you will be expected to be able to identify all digestive system organs by viewing them under a microscope or by seeing a photograph of them. To help you in practicing visual identification of digestive system organs under the microscope, I suggest you find websites on the internet that contain microscope images of digestive organs by searching with the keywords: Digestive Histology Quiz. (If you find a really good histology quiz website, please let me know and I will add it to the list below).

The following are some good visual digestive system histology review sights that I have found by searching with the keywords Digestive Histology Quiz. Some of these histology sites include organs, tissues, and terms that we did not include in our class. You can ignore the internet questions about organs, tissues, and terms that we did not cover.

http://imc02.hccs.edu/biologylabs/ap2/08Digestive/08DigestiveGIhistologyImages/DigestiveTractHistology_Quiz/mobile_pages/DigestiveTractHistology_Quiz.html

<http://education.med.nyu.edu/Histology/courseware/modules/gi-tract-q/q.gi.tract01.html>

<http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=12&ved=0CGkQFjAL&url=http%3A%2F%2Fwww12.homepage.villanova.edu%2Fthomas.chubb%2Fanatomy%2FS04%2Fhistoquiz.02.ppt&ei=sjHoUYT7FsaYigL68IDgBw&usg=AFQjCNEIY5KbnaZJGzy1Xeop1kGsOgfDQw&sig2=PTBKBgBbkuC0CR-8GYnlag&bvm=bv.49478099,d.cGE>

Answers for Review Questions for Digestive Histology topic:

- 1) C
- 2) D
- 3) D
- 4) B
- 5) A
- 6) A
- 7) D
- 8) D
- 9) D
- 10) A
- 11) C
- 12) A
- 13) C
- 14) A
- 15) B
- 16) D
- 17) A
- 18) A

19) A

20) C

21) B

22) B

23) C

24) A

25) A

26) A

27) D

28) C

29) C

30) C

31) B

32) C

33) D

34) A

35) B

36) B

37) D

38) C

39) A

40) B

41) Macromolecules

42) Polymers
Monomers

43) Digestion

44) Mechanical
Chemical

45) Chemical reactions
Physical forces

46) Enzymes

47) Abdominal cavity

48) Chyme
Gastrointestinal tract
Alimentary canal

49) Peristalsis

50) Segmentation contractions

51) GI tract organs
Accessory organs

52) Stomach, small intestine, and large intestine
Pancreas, gall bladder, and liver

53) Doesn't

54) The accessory organs make and secrete digestive juices into the GI tract.

55) Lumen

56) Mucosa, submucosa, and muscularis externa

57) Mucosa

Secretion of digestive juices

Absorption of nutrients and water

58) Submucosa

Irregular dense connective tissue

59) Muscularis externa

Peristalsis

Segmentation contractions

60) Circular layer

Segmentation contractions

Longitudinal layer

Peristalsis

61) Peritoneum

62) Pharynx

Esophagus

Epiglottis

63) Esophagus

64) Sphincters

65) Esophageal sphincter

Stomach

- 66) (A) Muscularis externa, smooth muscle, functions = peristalsis and segmentation contractions.
- (B) Submucosa, irregular dense connective tissue, functions = support mucosa, contains blood vessels to receive absorbed nutrients and water.
- (C) Mucosa, simple columnar epithelial tissue, functions = secretion of digestive juices and absorption of water and nutrients.
- (D) Peritoneum, epithelial and dense connective tissues, functions = supports and cushions the GI tract organs.
- (E) Lumen (empty space, not made of tissue), function = passageway for chyme to move through GI tract.

67) Rugae

68) Gastric pit
Gastric gland

69) Parietal cells, secrete hydrochloric acid (HCl)
Chief cells, secrete digestive enzyme

70) Three

71) Acid reflux (heartburn)

72) Smooth muscle, at junction of the stomach and the small intestine, controls the flow of chyme from stomach to the small intestine.

73) Pyloric sphincter
Small intestine

74) Small intestine

- 75) Duodenum (starred, triangle)
 - Jejunum (circled)
 - Ileum (boxed)

- 76) Plicae circularis

- 77) Villi

- 78) Epithelial mucosa cells
 - Microvilli

- 79) Brush boarder

- 80) Ileocecal sphincter

- 81) Colon

- 82) Water
 - Ions

- 83) Intestinal crypts
 - Centers for cellular reproduction

- 84) Feces

- 85) Goblet cells

- 86) Ascending colon
 - Transverse colon
 - Descending colon
 - Sigmoidal colon

87) Appendix

88) Defecation

89) Large intestine

90) Diarrhea

91) Pharynx

Esophagus

Stomach

Small intestine

Large intestine

92) Stomach = a, c

Small intestine = a, b, d, e

Large intestine = f, g

93) Stomach

94) Digestive enzymes

95) Buffer

Neutralizes

96) In the duodenum of the small intestine

97) Digestive enzymes (amylase, proteases, and lipase are specific digestive enzymes from the pancreas that were mentioned in the digestive enzymes lab)

98) Duodenum

Small intestine

99) Exocrine gland = a gland (a structure that secretes substances) the secretions of which exit the body.

100) Endocrine gland = a gland (a structure that secretes substances) the secretions of which enter the bloodstream. Almost all endocrine glands secrete hormones.

101) Acinar cells
Acini

102) Small intestine

103) Alpha cells
Glucagon hormone
Beta cells
Insulin hormone

104) Pancreatic islets
Islets of Langerhans

105) Blood stream

106) Small intestine = b, e
Stomach = b, e
Esophagus = a, b
Peritoneum = c
Pancreas = d

107) Bile

108) Right

109) Bile
Emulsify fat globules in the GI tract

110) Glucose
Glycogen

111) Hepatic portal vein

112) The largest liver structures that are seen under the microscope are called liver lobules. In the middle of each liver lobule is a blood vessel called a central vein. The corners of each liver lobule are called portal triads. Each portal triad contains a branch of the hepatic portal vein, a branch of the hepatic artery, and a bile ductule (a branch of the hepatic bile duct). Between the central vein and the portal triads are passageways between the liver cells that are called sinusoids and bile canaliculi. The sinusoids carry blood and the bile canaliculi carry bile.

113) A = Portal triad
B = Central vein
C and D = Sinusoids and bile canaliculi
E = Branch of hepatic portal vein
F = Bile ductule
G = Branch of hepatic artery

114) Jaundice

115) Large intestine: G 5
Oral cavity: G 1
Stomach: G 3
Esophageal sphincter: G 2
Pancreas: A
Duodenum: G 4
Liver: A
Gall bladder: A