Chapter 20 The Digestive System Exam Study Questions

20.1 Overview of GI Processes
1. Describe the functions of digestive system.

2. List and define the four GI Processes:

20.2 Functional Anatomy of the GI System
1. Match digestive processes and major components. Some letters may be used more than once.

   1) Peristalsis occurs at _______.
   2) Chewing and ingestion occur at _______.
   3) Swallowing occurs at _______.
   4) Segmentation occurs at _______.
   5) Haustration and mass movement occurs at _______.
   6) Migrating motility complex occurs at _______.
   7) Secretion of bile _______.
   8) Secretion of acid, IF, histamine and pepsinogen _______.
   9) Secretion of mucus _______.
   10) Secretion of gastrin _______.
   11) Secretion of CCK, secretin and GIP _______.
   12) Food absorption occurs at _____________.
   13) Movement of food does not occur at _______.
   14) Additional absorption of water, salt, vitamins B complex and K occurs at _______.

Figure 1 Digestive System
15) Use Figure 1 to match functions of digestive components (Table 20.1).

<table>
<thead>
<tr>
<th>Letter(s)</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The accessory gland that secretes pancreatic juice.</td>
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<tr>
<td></td>
<td>The accessory gland that secretes bile; metabolic processing of nutrients; removal of aged RBCs; elimination waste; manufacture plasma protein; storage of macromolecules, secretion, modification, and metabolizing of hormones.</td>
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<td>Transport food from mouth to esophagus.</td>
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<td>Control of defecation</td>
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<td></td>
<td>Mechanical breakdown food and initial digestion of starch and lipids with salivary enzymes.</td>
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<tr>
<td></td>
<td>Major site of food digestion and absorption; secretion of hormone and bicarbonate</td>
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<tr>
<td></td>
<td>Mechanical breakdown food, secretion of protein digestion enzymes and hormones; food storage</td>
</tr>
<tr>
<td></td>
<td>Storage feces</td>
</tr>
<tr>
<td></td>
<td>Conduction of food from pharynx to stomach</td>
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<tr>
<td></td>
<td>Absorption of water and electrolytes, synthesis vitamin; form feces</td>
</tr>
<tr>
<td></td>
<td>Secretion of saliva</td>
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<tr>
<td></td>
<td>Storage bile</td>
</tr>
<tr>
<td></td>
<td>Accessory glands</td>
</tr>
</tbody>
</table>

2. How does the stomach protect itself from self-digestion?

3. What does hepatic portal system do?
### 20.3 Digestion and Absorption of Nutrients and Water

1. Complete the table (pages 578 – 585)

<table>
<thead>
<tr>
<th>Major Digestion</th>
<th>Form of Absorption</th>
<th>Location of Absorption</th>
<th>Mechanism of Absorption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbohydrates</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Lipids</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Proteins</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. The final digestion of carboxylates is accomplished by _____ _____ enzymes (CD EX).

3. Pancreatic _____ is responsible for the majority of fat digestion (CD EX).

4. Absorption of sodium is coupled with the absorption of _____ (page 586).

5. Potassium ions, bicarbonate ions and water are _____ (active/passive) absorbed in small intestine (page 587).

6. The absorption of iron, calcium and vitamin B 12 all require the help of a ________ (page 587).

7. Colic bacteria provide substantial quantity of _____ as a byproduct of their metabolism (CD EX).

### 20.4 General Principles of GI Regulation

1. Describe the long reflex pathway of neural regulation of the digestive system.

2. Describe the short reflex pathway of neural regulation of GI function.

3. Describe the three phases of gastric intestinal control.
4. Increased parasympathetic activity _____ (enhance or decrease) GI activity.
5. What is the function of leptin?

6. Indicate which hormone(s) is being described by writing the appropriate letter (a-d) in the blank.
   1) ___secreted by the pyloric gland area.  
      a. Both secretin and CCK
      b. Secretin
      c. CCK
      d. Gastrin
   2) ___stimulated primarily by the presence of fat (fatty acids).
   3) ___inhibit(s) gastric secretion and gastric motility.
   4) ___ stimulates gastric secretion and motility in response to distension of the duodenum.
   5) ________ simulates pancreatic bicarbonate secretion (and enzyme secretion to a lesser extent)
   6) __________stimulates relaxation of the sphincter of Oddi.

7. (T/F) GIP inhibits gastric secretion and motility.

8. Indicate which digestive secretion is being described in each question by writing the appropriate letter in the blank using the correct letter: a-e.
   1) ___Pancreatic enzyme that digests protein.
      a. bile salts
      b. pepsin(ogen)
      c. amylase
      d. lipase
      e. trypsin(ogen)
   2) ___Gastric enzyme that digests protein.
   3) ___Enzyme that digests fat.
   4) ___Secreted by the salivary glands.
   5) ___Forms micelles to aid fat absorption.
   6) ___Activated by HCl.

9. Indicate the stimulus for the item in question by writing the appropriate letter in the blank using the correct letter: a-d.
   1) ___Stimulates secretion of CCK.
   2) ___Stimulates secretion of secretin.
   3) ___Stimulates secretion of gastrin.
   4) ___Directly inhibits secretion of gastrin.
   a. fat in the duodenum
   b. acid in the duodenum
   c. acid in the stomach
   d. protein in the stomach

10. Digested peptides and carbohydrates enter the blood of the ________ system

11. Digestive reflexes originated in the CNS are called ________

12. Short reflexes of the digestive system are integrated in ________
20.5 GI Secretion and Its Regulation

1. Saliva secretion is regulated by the ______center (p590).

2. Gastric secretion of acid and pepsinogen is controlled by
   a. Cephalic, gastric and intestinal-phase
   b. Neural reflex
   c. Hormones
   d. All of these

3. The secretion of pancreatic juice is controlled by
   a. Cephalic, gastric and intestinal-phase
   b. Secretin
   c. CCk
   d. All of these

4. The secretion of bile is stimulated by hormones _____ and _____(p593).

20.6 GI Motility and Its Regulation

1. (True/False) In general, parasympathetic activity promotes contraction force and digestive function

2. (True/False). Neural and hormonal activity generally affects the force of contraction rather than the frequency of slow wave in gastrointestinal smooth muscle.

3. The hormone __________ causes the ileocecal sphincter to relax during the gastric phase (CD EX).

4. Migrating motility complexes are controlled by the ______ nerve system (CD EX).

5. The _______ reflex stimulates mass movement of colon (CD EX).

6. The vomiting reflex is coordinated in the _____ (CD EX).