Section 38–1 Food and Nutrition (pages 971–977)

Key Concepts
• What are the nutrients your body needs?
• Why is water such an important nutrient?

Food and Energy (page 971)
1. Cells convert the chemical energy in glucose and other molecules into _____________.
2. The energy stored in food is measured in units called _____________.
3. Is the following sentence true or false? Your body can extract energy from almost any type of food. _____________
4. Besides supplying fuel, what are other important functions of food? _____________

Nutrients (pages 972–975)
6. Substances in food that supply the energy and raw materials your body uses for growth, repair, and maintenance are called _____________.
7. List the six nutrients that the body needs.
   a. _____________  d. _____________
   b. _____________  e. _____________
   c. _____________  f. _____________
8. Circle the letter of each sentence that is true about water as a nutrient.
   a. Water is the most important of all nutrients.
   b. Every cell in the human body needs water.
   c. Many of the body’s processes take place in water.
   d. Water makes up the bulk of bodily fluids, including blood.
9. How is water lost from the body? _____________
10. If enough water is not taken in to replace what is lost, _____________ can result.
11. Complete the concept map.

12. Why do you need fiber in your diet? _____________

13. Circle the letter of each choice that is a function of fat.
   a. Protecting body organs  c. Storing energy
   b. Insulating the body  d. Transporting oxygen

14. List four increased health risks associated with a diet high in fat.
   a. _____________  c. _____________
   b. _____________  d. _____________

15. Circle the letter of each choice that is a function of protein.
   a. Supplying raw materials for growth and repair
   b. Making up enzymes
   c. Helping the body absorb certain vitamins
   d. Producing cell membranes

16. The eight amino acids that the body is unable to produce are called _____________. amino acids.
Match each vitamin with its function.

<table>
<thead>
<tr>
<th>Vitamin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>17. A</td>
<td>a. Preventing cellular damage</td>
</tr>
<tr>
<td>18. D</td>
<td>b. Promoting bone growth</td>
</tr>
<tr>
<td>19. E</td>
<td>c. Repairing tissues and healing wounds</td>
</tr>
<tr>
<td>20. C</td>
<td>d. Promoting growth of skin cells</td>
</tr>
</tbody>
</table>

Match each mineral with a food that supplies it.

<table>
<thead>
<tr>
<th>Mineral</th>
<th>Food</th>
</tr>
</thead>
<tbody>
<tr>
<td>21. calcium</td>
<td>a. Table salt</td>
</tr>
<tr>
<td>22. zinc</td>
<td>b. Dairy products</td>
</tr>
<tr>
<td>23. chlorine</td>
<td>c. Eggs</td>
</tr>
<tr>
<td>24. iron</td>
<td>d. Seafood</td>
</tr>
</tbody>
</table>

Nutrition and a Balanced Diet (pages 976–977)

25. Which food category should make up the largest part of your diet? __________

26. In addition to eating properly, one should try to get at least __________ minutes of exercise each day.

Section 38–2 The Process of Digestion (pages 978–984)

Key Concepts
- What are the organs of the digestive system?
- What is the function of the digestive system?

Introduction (page 978)

1. What is the function of the organs of the digestive system? __________

The Mouth (pages 978–979)

2. The physical breakdown of large pieces of food into smaller pieces is referred to as __________ digestion.

3. The breakdown of large food molecules into smaller molecules that can be absorbed into the bloodstream is called __________ digestion.

4. Label the drawing of the digestive system with the following structures: mouth, esophagus, stomach, liver, small intestine, and large intestine.
5. What is the role of teeth in digestion? 

The Esophagus (page 980)
Match each term with its definition.

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. bolus</td>
<td>a. Contractions of smooth muscle that aid in swallowing</td>
</tr>
<tr>
<td>7. esophagus</td>
<td>b. Clump of chewed food</td>
</tr>
<tr>
<td>8. peristalsis</td>
<td>c. Food tube connecting the mouth and stomach</td>
</tr>
</tbody>
</table>

9. Is the following sentence true or false? The pyloric valve prevents the contents of the stomach from moving back up into the esophagus. ________________________

The Stomach (pages 980–981)
10. Circle the letter of each sentence that is true about the stomach.
    a. It produces hydrochloric acid.
    b. It produces trypsin.
    c. It helps in the mechanical digestion of food.
    d. It produces amylase.

11. Is the following sentence true or false? Pepsin cannot work under the acidic conditions present in the stomach. ________________________

12. A mixture of stomach fluids and food is referred to as ________________________.

The Small Intestine (pages 981–982)
13. Where does most chemical digestion take place? ________________________

14. Circle the letter of each sentence that is true about the pancreas.
    a. It produces amylase.
    b. It produces sodium bicarbonate.
    c. Its enzymes help break down lipids and nucleic acids.
    d. It produces lactase.

15. What role does the liver play in digestion? ________________________

16. Bile is stored in a small pouchlike organ called the ________________________.

 Digestive Enzymes

<table>
<thead>
<tr>
<th>Enzyme</th>
<th>Site of Action</th>
<th>Site of Production</th>
<th>Nutrient Digested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amylase</td>
<td>Mouth</td>
<td>Salivary glands</td>
<td>Carbohydrate</td>
</tr>
<tr>
<td>Pepsin</td>
<td>Stomach</td>
<td>Lining of stomach</td>
<td>Protein</td>
</tr>
<tr>
<td>Lipase</td>
<td>Small intestine</td>
<td>Pancreas</td>
<td>Fat</td>
</tr>
<tr>
<td>Amylase</td>
<td>Small intestine</td>
<td>Pancreas</td>
<td>Carbohydrate</td>
</tr>
<tr>
<td>Trypsin</td>
<td>Small intestine</td>
<td>Pancreas</td>
<td>Protein</td>
</tr>
<tr>
<td>Lactase</td>
<td>Small intestine</td>
<td>Lining of small intestine</td>
<td>Carbohydrate</td>
</tr>
<tr>
<td>Maltase</td>
<td>Small intestine</td>
<td>Lining of small intestine</td>
<td>Carbohydrate</td>
</tr>
<tr>
<td>Sucrase</td>
<td>Small intestine</td>
<td>Lining of small intestine</td>
<td>Carbohydrate</td>
</tr>
<tr>
<td>Peptidase</td>
<td>Small intestine</td>
<td>Lining of small intestine</td>
<td>Protein</td>
</tr>
</tbody>
</table>

17. Where are the majority of digestive enzymes active? ________________________

18. Which organ or gland produces the greatest number of different digestive enzymes? ________________________

19. Which digestive enzyme has more than one site of action and production? ________________________

20. Which digestive enzymes are active at a site different from the site where they are produced? ________________________

21. Which nutrient is digested by more enzymes than any other nutrient? ________________________

Absorption in the Small Intestine (pages 982–983)
22. Name the two parts of the small intestine where nutrients are absorbed.
    a. ________________________
    b. ________________________

23. Projections that cover the folds of the small intestine are called ________________________

24. Is the following sentence true or false? Molecules of undigested fat and some fatty acids are absorbed by lymph vessels called lacteals. ________________________

25. Is the following sentence true or false? The appendix plays an important role in human digestion. ________________________

The Large Intestine (page 984)
26. What is the primary job of the large intestine? ________________________
Digestive System Disorders (page 984)

27. A hole in the stomach wall is known as a(an) ___________________________.
28. When something happens that interferes with the removal of water by the large intestine, a condition known as __________________ results.

Reading Skill Practice

When you read about a complex process, representing the process with a flowchart can help you better understand and remember it. Make a flowchart to show how food travels through the digestive system and is broken down into simpler molecules that the body can use. For more information on flowcharts, see Appendix A of your textbook. Do your work on a separate sheet of paper.

Section 38–3 The Excretory System (pages 985–989)

Key Concepts
- What are the functions of the kidneys?
- How is blood filtered?

Functions of the Excretory System (page 985)
1. The process by which metabolic wastes are eliminated is called ____________________.
2. List four organs that are used for excretion.
   a. ____________________  c. ____________________
   b. ____________________  d. ____________________
3. List three ways that the kidneys help maintain homeostasis.
   a. ____________________
   b. ____________________
   c. ____________________

The Kidneys (pages 986–988)
4. Circle the letter of each sentence that is true about the kidneys.
   a. They are the main organs of the excretory system.
   b. They are located on either side of the spinal column.
   c. They remove excess water and waste products from the urine.
   d. They receive blood through the renal vein.

Match each term with its definition.

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. ureter</td>
<td>a. Saclike organ where urine is stored</td>
</tr>
<tr>
<td>6. urinary bladder</td>
<td>b. Functional unit of the kidney</td>
</tr>
<tr>
<td>7. renal medulla</td>
<td>c. Outer part of the kidney</td>
</tr>
<tr>
<td>8. renal cortex</td>
<td>d. Tube that carries urine from the kidney to the urinary bladder</td>
</tr>
<tr>
<td>9. nephron</td>
<td>e. Inner part of the kidney</td>
</tr>
</tbody>
</table>

10. Is the following sentence true or false? Nephrons are located in the renal medulla.

11. What ends up in the collecting duct? ____________________________

12. List the two processes involved in blood purification.
   a. ____________________  b. ____________________

13. The small network of capillaries in the upper end of the nephron is referred to as the ____________________.

14. The glomerulus is enclosed by a cup-shaped structure called the ____________________.
15. Complete the Venn diagram.

Filtration  Reabsorption

Processes that take place in the nephron

16. The materials that are filtered from the blood are collectively called the ____________________________.

17. List six materials that are filtered from blood.
   a. ____________________  c. ____________________  e. ____________________
   b. ____________________  d. ____________________  f. ____________________

18. Which substances are removed from the filtrate and reabsorbed by the capillaries?

19. What happens during the process of secretion?

20. Circle the letter of each sentence that is true about urine.
   a. It is the material that remains after reabsorption.
   b. It contains only urea and water.
   c. It is concentrated in the loop of Henle.
   d. It is released from the body through the urethra.

Control of Kidney Function (page 988)
21. How are the activities of the kidneys controlled?

22. Is the following sentence true or false? As the amount of water in the blood increases, the rate of water reabsorption in the kidneys increases. ____________________

Homeostasis by Machine (pages 988–989)
23. Is the following sentence true or false? Humans cannot survive with only one kidney. ____________________

24. The removal of wastes from blood using a machine is called ____________________.