Biology 12 Name: _____

Digestive System Per: _____ Date: _____

Chapter 9 – The Digestive System

Complete using BC Biology 12, page 262 – 293

9.1 The Digestive Tract pages 266 - 271

1. Put these functions of the digestive system in order from beginning to end: *absorb, digest, eliminate, ingest,*

   First step of digestion _____

   _____

   _____

   Last step of digestion _____

2. Distinguish between *mechanical digestion* and *chemical digestion*.
   Refer to both the process and give an example of an digestive structure that performs that process.

   _____

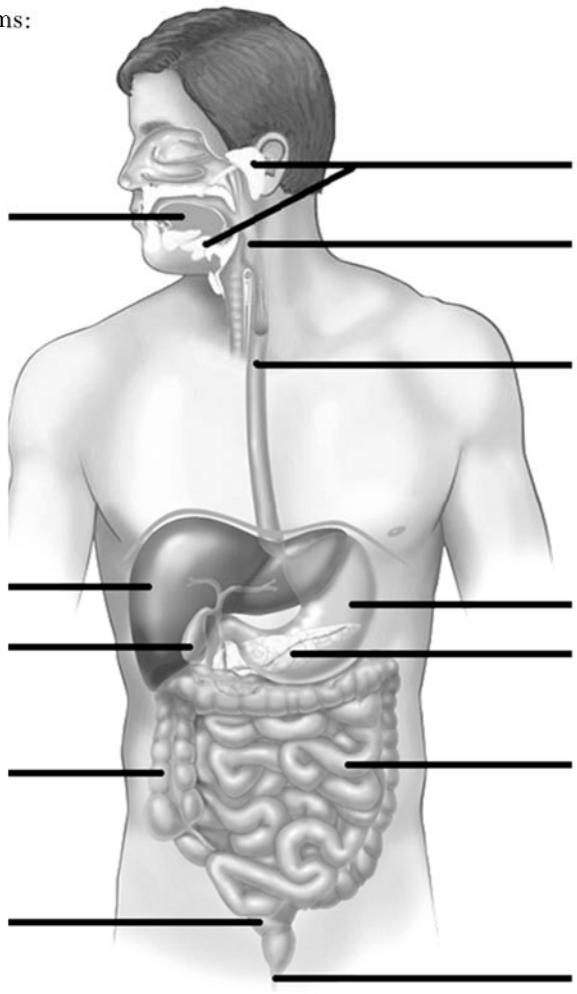
   _____

   _____

   _____

3. Complete the diagram with the following terms:
   - *A. anus*
   - *B. esophagus*
   - *C. gallbladder*
   - *D. large intestine*
   - *E. liver*
   - *F. pancreas*
   - *G. pharynx*
   - *H. rectum*
   - *I. salivary glands*
   - *J. stomach*
   - *K. small intestine*
   - *L. tongue*

4. Labels to add to the diagram:
   - *M. appendix*
   - *N. diaphragm*
   - *O. cardiac sphincter*
   - *P. pyloric sphincter*



5. Match the parts from the last question to their correct functions below
   _____ referred to by the term "gastric"; begins breakdown of proteins; acidic contents kills most bacteria
   _____ small, pear-shaped muscular sac attached to liver; storage of bile
   _____ relaxation of this muscle allows food to enter stomach, constriction reduces chance of heartburn
   _____ produces sodium bicarbonate (neutralize stomach acid), digestive enzymes, insulin and glucagon
   _____ elimination of solid wastes from the body
   _____ manipulates food to create a soft ball called a "bolus"
   _____ absorption of water, salts and some vitamins
   _____ passageway for both food and air
   _____ regulates the passage of partially digested food from stomach to small intestine
   _____ end of the large intestine; storage of indigestible material
   _____ absorption of nutrients; inner surface has high surface area due to folds called "villi"
   _____ tube allowing passage of food from mouth to stomach
   _____ wormlike projection found at the end of the cecum; thought to have a role in fighting infection
   _____ sheet of muscle that separates the abdominal and thoracic cavities
   _____ largest gland in the body; numerous functions including production of bile and detoxifying blood
   _____ makes food moist for ease of passage; produce a digestive enzyme to begin breakdown of starch
6. **Mouth**: Bound externally by the _____ and the _____. Sensory receptors called _____ are located on the _____ which is composed of _____ muscle. The roof of the mouth separates the _____ from the mouth preventing ingested food from entering that area. The roof has two parts: an anterior _____ and a posterior _____ _____. The hard palate consists of several _____ but the _____ palate is composed of _____ and _____ tissue. The soft palate ends in a finger-shaped projection called the _____.
7. Discuss the **salivary glands** using at least 3 different points.
   - _____
   - _____
   - _____
8. As the pharynx serves as a passageway for both food and air, what process is stopped while swallowing?
   _____
9. Describe the process of swallowing in a minimum of 3 steps.
   - _____
   - _____
   - _____
10. What is an "Adam's apple"? _____
11. Define **peristalsis**: _____
    *What is **reverse peristalsis** more commonly known as?* _____

12. When stomach acid comes in contact with the esophagus, the result is called _____ or _____. A more serious form of this is _____ _____(GERD) which may lead to more problems such as _____, _____, or even _____ cancer.

13. Fill in the table below regarding an adult **stomach**

Average length	
Diameter	
Maximum volume	
Chemical contents	
pH	
# of muscle layers	
Length of time food spends here	

14. What is the difference between a *bolus* and *chyme*? _____

_____

_____

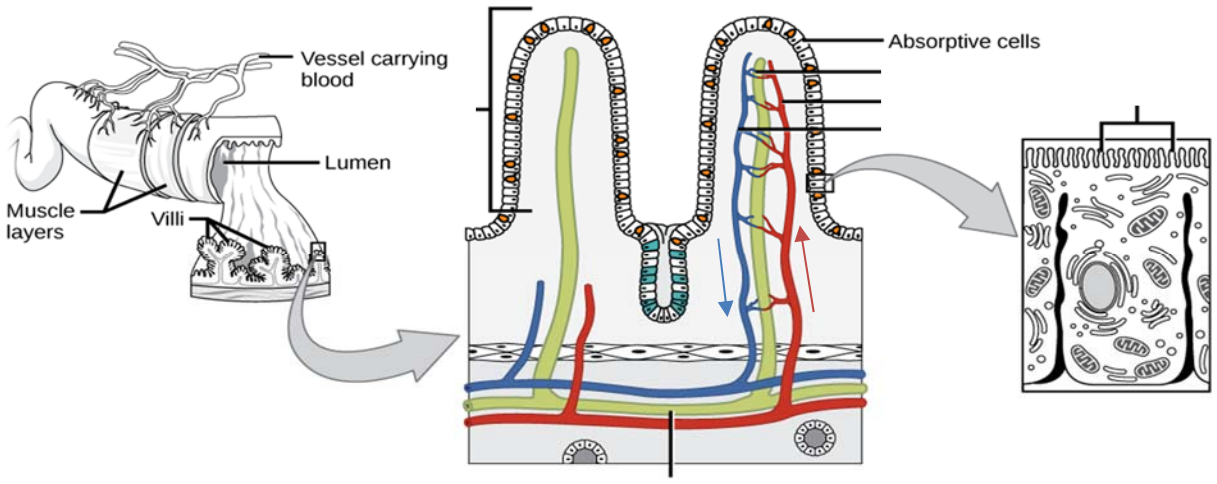
15. Compare the following organs.

	Small Intestine	**Large Intestine**
Diameter		
Length		
Absorbs		

16. What is the name of the beginning section of the small intestine? _____
What is special about this section? _____

_____

17. The inner surface of the small intestine contains fingerlike projections.
On the diagram below, label: artery, lacteal (*lymphatic capillary*), lymphatic vessel, microvilli, vein, villi



18. Using the terms from the last question, fill in the blanks.
    Glycerol and fatty acids are packaged and enter the _____.
    Sugars and amino acids enter the _____ and _____.
19. Name the hormones that promote the secretion of various digestive juices.
    _____ stimulated after eating a protein rich meal
    _____ stimulated by acid present in chyme
    _____ stimulated by partially digested protein and fat
20. Give the four components of the **large intestine**:
    - _____
    - _____
    - _____
    - _____

9.2 Accessory Organs of Digestion

pages 271 - 273

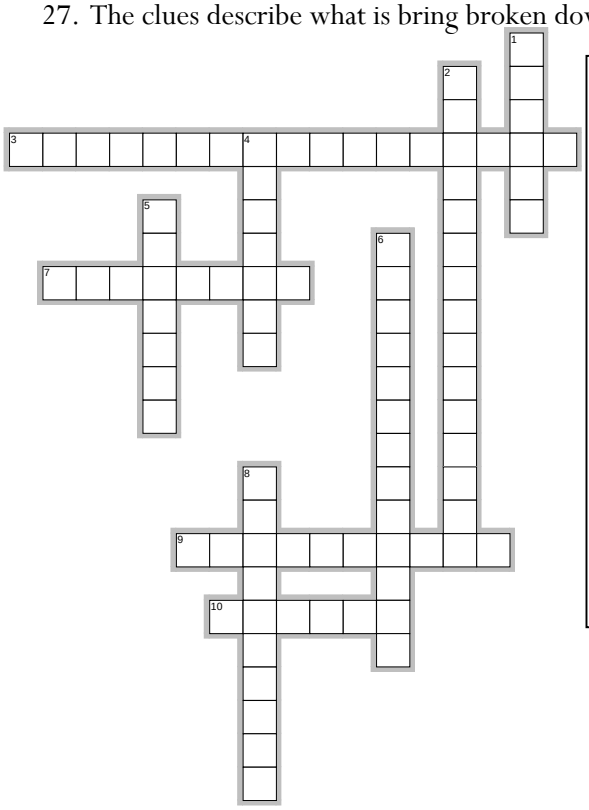
21. Along with the salivary glands, the _____, _____ and _____ are considered to be accessory digestive organs. What do you think the term "accessory" means in this context? _____
    _____
    _____
22. Briefly describe the endocrine and exocrine functions of the pancreas.
    - Endocrine: _____
    - Exocrine: _____
23. Draw a diagram to explain the role of insulin and glucagon. *See Figure 9.9 on page 272 for guidance.*

24. List seven functions of the liver (there are actually hundreds of known functions!)
    1. _____
    2. _____
    3. _____
    4. _____
       _____
    5. _____
    6. _____
       _____
    7. _____

25. Bile is produced by the liver and stored in the gall bladder. The yellowish-green colour is due to the presence of _____ derived from the breakdown of _____. Bile also contains _____ derived from _____. Bile is responsible for _____ fat in the small intestine allowing it to be acted upon by digestive enzymes.
26. Why can we survive without a gallbladder but not without our liver? _____

9.3 Digestive Enzymes pages 273 – 275

27. The clues describe what is bring broken down, the site of action and the optimum pH for the enzyme.



Across

3. Starch to maltose; small intestine; basic pH
7. RNA & DNA to nucleotides; small intestine; basic pH
9. Peptides to amino acids; small intestine; basic pH
10. Fat droplet to glycerol and fatty acids; small intestine; basic pH

Down

1. Protein to peptides; stomach; acidic pH
2. Starch to maltose; mouth; neutral pH
4. Protein to peptides; small intestine; basic pH
5. Maltose to glucose; small intestine; basic pH
6. Nucleotides to base, sugar and phosphate; small intestine; basic pH
8. Precursor to pepsin

28. What is the role of each of the following in digestion?
    - sodium bicarbonate: _____
    - hydrochloric acid: _____
    - mucus: _____
    - water: _____

9.4 Disorders of the Digestive System pages 275 - 279

29. These are scattered through the previous sections. Match the term with the description.

A. cleft palate _____ swelling of the salivary glands caused by a viral infection

B. tonsillitis _____ bones of hard palate are not fused together, leaving a gap (1 in 700 newborns)

C. mumps _____ inflammation of lining of abdominal cavity

D. peritonitis _____ inflammation of the lymphatic glands found at the back of the mouth

30. Complete the table. Your knowledge of the disorders will not be tested but rather is provided for interest.

Disorder	Description
Digestive Tract	
	Damage of stomach wall by hydrochloric acid due to the protective layer of mucus lining stomach being broken down. What are the possible causes? • (most common) • •
	Loose, watery feces caused by inability of large intestine to absorb sufficient amounts of water. Can lead to dehydration and disturbances in the heart.
	Chronic diarrhea. Genetic predisposition is a factor, as are several environmental factors.
	Feces are hard and dry.
	Chronic constipation can lead to this.
	Small growths arising from epithelial lining. Can be benign (harmless) or cancerous.
Accessory Organs	
	Inflammation of pancreas. Can be caused by excessive alcohol consumption, gallstones, or other unknown factors.
	Almost always fatal (20% survival one year after diagnosis)
	In 2009, 2.4 million Canadians had this condition. Distinguish between type 1 and type 2.
	Yellowish colouring in whites of eyes as well as in skin. What is it caused by?
	Inflammation of the liver, most commonly caused by viruses
	Chronic disease often seen in alcoholics. Preferred treatment is a liver transfer but supply is insufficient to meet the demand for them!
	Crystals form in the gallbladder and may block the common bile duct. Particularly common in people who have lost a lot of weight in a short period of time or have undergone gastric bypass procedure

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____
21. _____
22. _____
23. _____
24. _____
25. _____
26. _____
27. _____
28. _____
29. _____
30. _____
31. _____
32. _____
33. _____
34. _____
35. _____
36. _____
37. _____
38. _____
39. _____
40. _____
41. _____
42. _____
43. _____
44. _____
45. _____

46. Match the descriptions to the part.

a. _____
b. _____
c. _____
d. _____
e. _____
f. _____
g. _____
h. _____
i. _____
j. _____
k. _____
l. _____
m. _____
n. _____
o. _____
p. _____
q. _____
r. _____
s. _____
t. _____

49. _____

_____

50. _____

_____

52. _____

_____

53. _____

_____

56. _____

_____

65. Diagram of control of blood glucose level

a. _____
b. _____
c. _____
d. _____
e. _____
f. _____
g. _____
h. _____

68. (X) _____ (Y) _____ (Z) _____

69. (X) _____ (Y) _____ (Z) _____

Mark the review questions using the answer key on pages 541 - 543