Overview

1. Explain the differences between *digestion*, *absorption*, and *elimination*. (p.214, 219, 220. (Note that the term *defecation* is used in the text instead of *elimination*).

	Digestion	Absorption	Elimination
Differences:			

Organs of Digestion

1. Using fig.12.1 p.214, give the function of the following digestive organs:

Organ	Function
a. oral cavity	
b. tongue	
c. teeth	
d. epiglottis	
e. pharynx	
f. salivary glands	
g. esophagus	
h. cardiac sphincter	
i. stomach	
j. pyloric sphincter	
k. duodenum	
l. small intestine	
m. liver	
n. gall bladder	
o. pancreas	

p. colon _____

q. appendix _____

r. rectum _____

s. anus _____

Enzymes in Digestion

1. Food is broken down by both physical and chemical processes. Enzymes play a very important role in digestion as they break down the food chemically. Below is a chart that will help you identify specific enzymes, their source, and their digestive action. Use your text *pp.224-225* including *table 12.2 p.225* as a reference to fill-in the chart.

Enzyme	*Source*	*Action*
a. salivary amylase		
b. pepsin		
c. pancreatic:		
- amylase		
- lipase		
- trypsin		
d. maltase		
e. peptidases		

The Process of Digestion

1. Describe the following digestive processes and give a specific example of each: *(p.217, 223)*

Process	*Description*	*Example*
a. emulsification		
b. peristalsis		
c. swallowing		

Stomach

The stomach is lined with gastric glands which produce gastric juice, a mixture of pepsinogen and HCl.

1. What effect does HCl have on:

   a. pepsinogen?

   b. pH of the stomach?

   c. Why are these acidic conditions necessary in the stomach?

Pancreas and Gall Bladder

(p. 222-223)

1. The pancreas and the gall bladder play a very important role in digestion. Be able to identify the pancreas and gall bladder from a diagram. *(fig. 12-7 p220) and fig. 12-10; 11 p. 222-3)*

2. Below is a list of secretions from the pancreas called "pancreatic juice". Explain their role in the digestive process.

Secretion	*Role in digestion*	*Example*
a. amylase	_____	_____
b. trypsin	_____	_____
c. lipase	_____	_____
d. sodium bicarbonate	_____	_____

3. The gall bladder secretes bile salts.

   a. Where are these bile salts produced?

   b. Why is bile green in colour?

   c. How do bile salts reach the intestine and what is their function in the digestive process?

   d. What would occur if bile salts were *not* secreted by the gall bladder?

The Liver

(pp. 222-223)

1. List 6 major functions of the liver and give at least one example of each function.

	Function	*Example*
a.		
b.		
c.		
d.		
e.		
f.		

2. Explain how the liver regulates the level of sugar in the blood using the reactions shown below, and protein deamination.

(——— in the liver ———) *(to the blood)*

a. Glycogen ➞ Glucose ➞ Glucose

b. protein deamination

The Small Intestine

(p.219-20 fig. 12.6, p. 219)

1. Explain how the small intestine is structurally designed for the absorption of nutrients into the blood. Use the headings below to guide your answer:

   a. surface area of the villi

   b. relationship between the villi and the microvilli

   c. role of the blood vessels within villi

   d. role of the lacteals within the villi

Control of Digestion

1. Contrast *digestion* and *absorption* in the small intestine. *(pp. 219, 224)*

2. Fully explain how the following hormones regulate the flow of digestive juices. (p. 220).

   a. gastrin

   b. secretin

   c. CCK

3. Explain how the following influence the process of digestion:

Factor	*How it influences digestion*
a. Mechanical stimulation of stomach by the food	_____
b. Senses like sight, smell, and taste	_____

The Large Intestine

(p.220-1)

1. Describe the role of the large intestine in the process of digestion.

2. What is the role of *E. coli* in the large intestine?

Human Nutrition

(pp.)

1. Explain why the following are important to human nutrition:

    a. carbohydrates

    b. proteins

    c. fats

    d. vitamins

    e. minerals

Disorders of the Digestive System

1. Using your text and the Merck manual, describe the *characteristics*, *causes*, and suggest *corrective measures* for your choice of *any two* of the following disorders:

    a. constipation
    b. gall stones
    c. hepatitis
    d. heartburn
    e. mumps
    f. peritonitis
    g. ulcers
    h. cirrhosis
    i. hemorrhoids
    j. hernia
    k. flatulence
    l. diarrhea
    m. appendicitis
    n. jaundice

2. Modern research link dietary factors to cancer. Relate dietary constituents to digestive system cancers.

Sample Exam Questions

1. It can be argued that the pancreas has a double function. Defend this statement using specific examples.

2. Trace the complete digestion of a (a) protein, (b) carbohydrate, (c) fat. Your answer should include:

    a. the pathway taken by the food
    b. specific enzymes and their reactions

3. Describe how the following work together in the process of digestion:
    a. liver, gall bladder, and small intestine
    b. pancreas and small intestine
    c. secretin, gastrin, CCK

4. Explain how the following events would affect general digestion:
    a. stapling of part of the stomach to reduce its size
    b. removal of the gall bladder
    c. blockage of the bile duct into the duodenum
    d. removal of 2 meters of the small intestine beyond the pancreatic duct

5. Organs often work together during various physiological processes. Describe how the pancreas and the gall bladder work together during digestion.

6. Explain how the small intestine is designed for absorbing nutrients into the blood from digestion.

7. Why is the large intestine important in regulating the fluid level in the body?