1. List the organs (in order) that make up the GI tract.
   Mouth, esophagus, stomach, small intestine, large intestine, and rectum.

2. Name the four “assisting” organs that are not part of the GI tract but are needed for proper digestion. What are their roles in digestion?
   - The salivary glands produce saliva that moistens food, lubricating it for easy swallowing. Saliva contains enzymes that begin the process of chemical digestion.
   - The liver produces and secretes bile, which emulsifies fats in the small intestine, thus aiding fat digestion.
   - The gallbladder stores and concentrates bile from the liver.
   - The pancreas secretes digestive enzymes that help digest nutrients.

3. List the five sphincters/valves and where they are located.
   Upper esophageal (mouth/esophagus)
   Lower esophageal (esophagus/stomach)
   Pyloric (stomach/small intestine)
   Ileocecal (small intestine/large intestine)
   Anal (Rectum within large intestine)

4. What substance makes the stomach contents acidic? What substance protects stomach cells from the low pH of stomach contents?
   Hydrochloric acid produced by cells that line the stomach lowers the pH of the stomach contents to about 2.
   Mucus, also produced by stomach lining cells, protects these cells from the acid environment.

5. What is the main difference between the roles of small intestine and large intestine?
   Small intestine is where majority of nutrient digestion and absorption takes place. Absorption of minerals and water mainly take place in the large intestine as well as digestion of fibers by bacteria.

6. What features of the small intestine makes high absorption possible?
   Small intestine. The many folds from villi and microvilli allow a large absorptive surface for an efficient process of nutrient absorption.
7. What two circulatory systems transport absorbed nutrients around the body? Water-soluble nutrients and fat-soluble nutrients prefer which route of transportation?
   Vascular system (blood circulatory system) and lymphatic system
   In general, vascular system carries water-soluble nutrients, while the lymphatic system varies fat-soluble nutrients.

8. Increasing fiber in the diet may decrease symptoms of the GI disorder diverticulosis. List other benefits of eating a high-fiber diet.
   A high-fiber diet:
   • Helps control weight by delaying gastric emptying and providing a feeling of fullness
   • Improves glucose tolerance by delaying the movement of carbohydrate into the small intestine
   • Reduces risk of heart disease by binding with bile (which contains cholesterol) in the intestine and causing it to be excreted, which in turn helps to lower blood cholesterol levels
   • Promotes regularity and reduces constipation by increasing stool weight and decreasing transit time

9. Which of the following transport mechanism allows nutrients to be absorbed with a help of a transport protein?
   a. Passive diffusion
   b. Facilitated diffusion
   c. Active transport
   d. B and C only
   e. All of the above

10. Describe how heartburn occurs.
    The backflow content containing acidic HCl in the stomach can cause tingly sensation at the esophageal sphincter. Because the sphincter is near the heart, people mistakenly assume that it is heartburn.

11. Name at least one enzyme involved in digesting the following macronutrients:
   a. Carbohydrate – salivary amylase, pancreatic amylase
   b. Protein – pepsin, hydrochloric acid (HCl), pancreatic protease
   c. Lipid – bile, pancreatic lipase, gastric lipase, lingual lipase