All science problems address TEKS 130.224. Restaurant Management.

**Restaurant Management.** (6) The student understands the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. The student is expected to:

(E) research sources of food-borne illness and determine ways to prevent them

**Biology.** (4) Science concepts. The student knows that cells are the basic structures of all living things with specialized parts that perform specific functions and that viruses are different from cells. The student is expected to:

(C) compare the structures of viruses to cells, describe viral reproduction, and describe the role of viruses in causing diseases such as human immunodeficiency virus (HIV) and influenza.

**Biology.** (8) Science concepts. The student knows that taxonomy is a branching classification based on the shared characteristics of organisms and can change as new discoveries are made. The student is expected to:

(C) compare characteristics of taxonomic groups, including archaea, bacteria, protists, fungi, plants, and animals.

1. A student complains about having abdominal cramps and diarrhea. She has a slight fever. The symptoms occurred after eating homemade cookie dough ice cream. Which pathogen could be responsible?
   a. *Clostridium botulinum*
   b. *E. coli*
   c. *Salmonella*
   d. *Listeria monocytogenes*
2. In the past two years, there has been an increase in the number of food borne illnesses in the United States. Food borne illnesses can be caused by various contaminants. Which substrate below is not responsible for causing food borne illnesses?
   a. fungi
   b. viruses
   c. *Listeria monocytogenes*
   d. all bacteria will cause food borne illnesses

3. In September of 2011, the United States faced its largest outbreak of food borne illness *Listeriosis* in 25 years. Up to two months can elapse from the time the contaminated food is consumed to the time the disease develops. Victims suffer from symptoms such as fever, chills, headaches, stomach pain, diarrhea, and death in severe cases. This illness is caused by a
   a. bacteria
   b. virus
   c. parasite
   d. protozoa

4. *Salmonella* is a common source of food borne illnesses. Symptoms include stomach pain, diarrhea, nausea, chills, fever, and headache, which typically occur from 8 to 72 hours after consuming contaminated food sources. This pathogen, found on contaminated eggs and poultry, is caused by a
   a. bacteria
   b. virus
   c. parasite
   d. protozoa

5. *Trichinella* can be found in raw undercooked meat. Consumption of contaminated meat could result in trichinosis. Symptoms include nausea, diarrhea, vomiting, fatigue, fever, abdominal discomfort, followed by headaches, swelling in the face and weakness. *Trichinella* can be classified as a
   a. bacteria
   b. virus
   c. parasite
   d. protozoa

6. When purchasing canned goods, consumers should avoid cans that are bloated. What is a reasonable explanation for this?
   a. The can has more air than the food; therefore, you would be getting less food
   b. The can could be contaminated with *Listeria monocytogenes*
   c. The can could be contaminated with *Clostridium botulinum*
   d. It is okay to buy them; proper cooking will make the food safe for eating
7. Bacteria contamination poses a potential threat to our food supply. Which of the following is not a way to reduce the risk posed by bacteria?
   a. Food should be kept at warm temperatures to prevent the bacteria from growing
   b. Food should be heated to high temperatures to kill the bacteria
   c. Food should be kept covered to prevent exposure to bacteria
   d. Food should be stored in cold temperatures to slow down bacteria growth

8. Which type of pathogen poses the greatest threat to canned food products?
   a. aerobic bacteria
   b. anaerobic bacteria
   c. parasites
   d. fungi

9. Which of the following can cause food borne illnesses, but is present in our digestive tract?
   a. E. coli
   b. Bacillus anthracis
   c. Listeria monocytogenes
   d. Staphylococcus aureus

10. Canned foods, if bloated, may contain Clostridium botulinum. In these cases, the can may be used if
    a. the food is cooked for an extended amount of time
    b. the can is frozen prior to opening
    c. the can is boiled for one hour before opening to cook the bacteria inside
    d. the can may never be opened since there is no way of removing the contaminated food or making it safe for consumption
Answer Key

1)  C  
2)  D  
3)  A  
4)  A  
5)  C  
6)  C  
7)  A  
8)  B  
9)  A  
10) D