Microbiology (Bio 206)

Problem Set #1

These problems are intended to be similar to questions you might see on an exam.
An answer key is posted on the course Web site:
english.sxu.edu/~visick/micro.htm (click on Answer Keys)

1. Detergents can be effective in killing bacteria because they are able to disrupt the phospholipid bilayers that make up membranes. Based on what you know about cell wall structure, do you think a Gram-positive organism or a Gram-negative organism would typically be more easily killed by a detergent? Explain your answer.

2. Penicillin kills bacterial cells by attacking the cell wall.
   a. Explain briefly why it is safe for us to take penicillin; in other words, why don’t we have to worry about it killing our own cells?
   b. Would it be safe to use penicillin to kill bacteria that are causing disease in a plant? Or would there be a risk that it would kill the plant cells? Explain.

3. Matching: For each of the following cell structures, use the appropriate letter to indicate whether it is found in prokaryotic cells, eukaryotic cells or both.

   _______ Cell membrane   a. Prokaryotic cells only
   _______ Circular DNA   b. Eukaryotic cells only
   _______ Ribosomes   c. Both prokaryotes and eukaryotes
   _______ Membrane-bound organelles
   _______ Peptidoglycan
   _______ Fimbriae

4. List two eukaryotic organisms that are considered to be microorganisms.

5. What is one kind of microorganism that microbiologists study that is neither a prokaryote nor a eukaryote?

6. Why were believers in spontaneous generation convinced by Pasteur’s swan-necked flask experiment when they hadn’t been convinced by previous experiments?

7. What is the term for bacteria that require oxygen, but only in small doses? Would you expect these bacteria to have protective enzymes such as catalase and superoxide dismutase?