

## ANSWERS TO CHAPTER REVIEW QUESTIONS

1. b Bacteria are classified by need for oxygen, shape, and staining properties. Different microorganisms react differently when stained with colored dyes in the lab. Gram-positive microorganisms stain purple, and gram-negative microorganisms stain pink.
2. e Beta-lactam antibiotics have similar chemical components and act by inhibiting bacteria cell wall synthesis. This means the bacteria must be actively dividing, or the antibiotic won't be effective. Resistance to these types of antibiotics mechanistically occurs because of enzymes that destroy the beta-lactam ring.
3. d New research on the role of antivirals for flu treatment is being published almost every week. This is largely because flu is a common ailment with a large market for pharmaceutical companies. The significance of a drug decreasing the duration of flu differs on an individual basis. If you picked answer e, note that ribavirin is an antiviral that works for RSV and influenza A and B, but of these, it is used to treat only RSV.
4. d Viruses are the most common infectious agents in humans. They are classified by whether they contain RNA or DNA. Some dormant viruses can surface years after transmission.
5. c White blood cell elevation is nonspecific and doesn't always indicate an infection.
6. Cidal drugs actively kill bacteria. Static drugs inhibit replication of microorganisms and prevent growth of organisms but do not kill them.
7. Antibiotic resistance means the drug can no longer fight the infection. Antibiotic resistance occurs largely because of antibiotic overuse and misuse. Infections that were once easy to treat can now be life threatening due to resistance.
8. Antibiotics frequently need to be started to treat a sick patient before lab tests can identify the organism causing the infection. Empiric therapy is based on knowledge of what microorganisms most likely cause infections at the suspected site of infection. Sore throats are frequently caused by group A *Streptococcus*, for example, and oral antibiotics are empirically selected to treat that bacteria.
9. Broad- and narrow-spectrum antibiotics are classified by the types of bacteria they cover. Using a broad-spectrum antibiotic to treat a simple infection would be like using a cannon where a BB gun would work.