Chapter 6 Essential Knowledge 2.0

Write a detailed response to each of the following pieces of information. If numbers are given in parentheses, they refer to the pages of your text book.

Main Concept: All living systems require constant input of free energy. **AND** Interactions between molecules affect their structure and function.

1. Describe the relationship between a substrate and the active site of an enzyme.
2. What is the allosteric site of an enzyme? How does allosteric inhibition affect an enzyme?
3. Discuss how cofactors and coenzymes affect the structure, function and rate of an enzyme.
    a. Contrast cofactors and coenzymes.
4. Explain, with a specific example, how an enzyme's activity can be:
    a. Enhanced by molecules in the environment
    b. Inhibited by molecules in the environment.
    c. Altered by a molecule binding irreversibly to the enzyme's active site.
    d. Altered by a molecule binding reversibly to the enzyme's active site.
5. Sketch graphs of enzyme activity as a function of time under the following conditions:
    a. Increase in substrate concentration
    b. Increase in enzyme concentration
    c. The presences of a competitive inhibitor
    d. Increase in temperature past the enzymes optimum.
    e. Decrease in substrate concentration
6. "Life requires an ordered system", explain the statement.
7. How do biological systems offset the increase in entropy and disorder of the system?
    a. How does the coupling of cellular processes help to maintain order?
    b. Draw and describe how the hydrolysis of ATP to ADP provides the free energy necessary to power many of life's processes.