Name_ Date

Per

CHAPTER 8 STUDY QUESTIONS – Metabolism and Enzymes (8.1, 8.2, 8.4, 8.5)

1) Contrast catabolic and anabolic pathways.

2) Define the following terms: these terms and concepts are critical!

- A) Energy
- B) Kinetic energy
- C) Heat / thermal energy
- D) Potential energy
- E) Chemical energy

3) Contrast **EXERGONIC** and **ENDERGONIC** reactions in terms of: change in free energy, stability (spontaneity), capacity to do work.

4) Is a living organism a "closed" or "open" system in terms of energy exchange? Explain.

5) What is activation energy?

6) Label the diagrams below including the change in free energy. (see fig. 8.12 & 8.13)





7) Define the following terms:

A) Substrate:

B) Enzyme substrate complex:

- C) Active site:
- D) Induced fit:

8) Label the following diagram: (see fig. 8.15)

9) How does substrate concentration affect enzyme reaction rate?

10) How do temperate and pH (specifically) affect enzyme activity?

11) Compare and contrast **COMPETITIVE** and **NONCOMPETITIVE** inhibitors.

12) **WHAT IF?:** Malonate is an inhibitor of the enzyme succinate dehydrogenase. How would you determine whether malonate is a competitive or noncompetitive inhibitor?

13) What is ALLOSTERIC REGULATION and how does assist in the regulation of metabolism?

14) What is COOPERATIVITY?

15) How does **FEEDBACK INHIBITION** work? Give an example of a pathway in cells that makes use of feedback inhibition.

16) **WHAT IF?:** Imagine you are a pharmacological researcher who wants to design a drug that inhibits a particular enzyme. Upon reading the scientific literature, you find that the enzyme's active site is similar to that of several other enzymes. What might be a good approach to developing your inhibitor drug?

