***Enzymes and Energy Possible FRQ’s***

You will see one or more of these questions on your next AP Biology exam. On the day of the exam, a former AP Biology student will come in and pick the number(s) between 1 and 5 out a hat. The number(s) chosen will be the free response written for that exam.

**“If you fail to plan…plan to fail.”**

1**.** **State** the First and Second Law of Thermodynamics. Use the Second Law of Thermodynamics to **explain** the energy relationship between the biological processes of photosynthesis and aerobic cellular respiration. Be sure to **identify** and **describe** which of these two reactions is exergonic and endergonic.

**2.** Most enzymes are globular and therefore tertiary in structure.

 **(a)** **Describe** the tertiary structure of proteins being sure to include the interactions between the side

 chains that contribute to its overall shape.

 **(b)** Explain how the tertiary structure of an enzyme allows it to perform its function.

 **(c) Compare** and **contrast** the effects of competitive and noncompetitive inhibition on enzyme action

 by explaining how each affects enzyme structure.

**3.** **(a)** What are enzymes and how EXACTLY do they affect chemical reactions. **Draw** and **label** an

 “idealized” graph to *help* you **explain** the difference between a catalyzed chemical reaction and a noncatalyzed chemical reaction in terms of the activation energy required. *(Fig. 6.13)*

 **(b)** **Draw** an “idealized” graph for each of the following to *assist* you in **explaining** the relationship

 each have on enzyme activity.

 **(i)** temperature

 **(ii)** pH

 **(iii)**  [substrate]

**4.** **Graph**, **Calculate** and **Compare** the rates of enzyme catalyzed reactions.

**5.** Basic Statistics Questions and Computations.