**Questions to answer:**

1. State the first law of thermodynamics and explain how living systems comply with this law.  Provide one real-life example to support your explanation.
2. State the second law of thermodynamics and explain how living systems comply with this law.  Provide one real-life example to support your explanation.
3. How is the maintenance of a highly ordered living system possible, given the tendency of the Universe to tend toward increasing disorder?  Provide an explanation for the order of an organism, AND an explanation for the order of successive generations of organisms
4. Is a living system ever in equilibrium with it’s surroundings?  Explain why or why not, and when equilibrium occurs (if ever).
5. Explain the energetic advantage of coupling exergonic reactions to endergonic reactions.  Which reaction must be greater in terms of energetic magnitude?
6. Organisms are endergonic systems.  What are the exergonic reactions that provide living systems with energy (give two examples).

**Things You Should Make Sure You Understand:**

* The relationships between the following pairs of words:
* Anabolic and Catabolic
* Exergonic and Endergonic
* Energy and Free Energy
* Open and closed system
* The energetic relationship between an organism and it’s surroundings.
* Why organisms need to release energy in a series of controlled steps
* The structure of an ATP molecule.
* How an ATP molecule is converted into an ADP molecule and how that process produces energy.
* Why we can’t consume ATP directly.
* Why living systems need to take in more energy than they put out into the environment.