

Study Guide Chp 8-10

Chapter 8

1. Define: Metabolism.
2. What is a metabolic pathway?
3. Draw a reaction curve and label: anabolic, catabolic, exergonic, endergonic, reactants, products, free energy, activation energy barrier, uphill, downhill, spontaneous, nonspontaneous, catalyzed, noncatalyzed. Make sure you know the definition and understand the concept behind each term also. Are anabolic or catabolic reactions spontaneous? Which process releases free energy? Which process needs free energy?
4. Describe all the forms of energy.
5. What does the first and second law of thermodynamics state?
6. For a process to occur spontaneously, it must increase _____ of the universe.
7. The entropy of a particular system, such as an organism, may actually decrease as long as the total entropy of the universe-the system plus its surroundings _____?
8. Name the three types of cellular work ATP can perform.
9. How is ATP involved in energy coupling? The use of an _____ process drives an endergonic one.
10. What does it mean to be phosphorylated?
11. How do enzymes lower the activated energy barrier?
12. What is an induced fit?
13. What are cofactors?
14. What is the difference between competitive and noncompetitive inhibition?
15. Describe the process of allosteric regulation and cooperativity. Which process binds the active site, and which binds the regulatory site?
16. What is feedback inhibition?

Chapter 9

1. Define: fermentation, aerobic respiration, anaerobic respiration.
2. What are redox reactions? Define: oxidation, reduction, reducing agent, and oxidizing agent. In the cellular respiration equation, label with these terms.
3. What process during cellular respiration can occur with or without the presence of oxygen?
4. NAD⁺ acts as electron shuttle to where?
5. Why does glycolysis have two phases?
6. Describe figure 9.10. What molecule is entering the CAC?
7. During aerobic respiration, does NADH or FADH₂ donate electrons at a lower energy level?
8. Describe the process of chemiosmosis. What is the proton motive force?
9. What phase of the cycle produces the most ATP?
10. What is added to the ETC?
11. In figure 9.13, what does the roman numerals stand for?
12. How is NAD⁺ regenerated during fermentation?
13. What is the purpose of beta-oxidation?
14. Why are carbohydrates and fats considered high energy food?

14. Fill in the handouts as study guide for the rest of the chapter.

Chapter 10

1. Define: photosynthesis, autotroph, heterotroph.
2. In figure 10.3, be able to label all the parts of the chloroplast, and give a definition of each term.
3. What is a mesophyll cell?
4. What are the two stages of photosynthesis? What is the equation for photosynthesis?
5. Where does water splitting take place?
6. Light reactions: located in the _____:
split water, release oxygen, reduce NADP⁺ to NADPH, generate ATP from ADP by photophosphorylation
7. Dark reactions (Calvin cycle): located in the _____?
8. The Calvin cycle begins carbon fixation by incorporating what into organic molecules?
9. Be able to reproduce figure 10.5.
10. Define: light, wavelength, electromagnetic spectrum, visible light, photon.
11. What is the absorption spectrum of chlorophyll a? What do carotenoid and chlorophyll b absorb? What is the purpose of carotenoids?
12. How does fluorescence occur?
13. What are the three phases of the Calvin cycle?
14. Carbon enters as _____ and leaves as a sugar named _____ in the Calvin cycle. What products of the light phase of photosynthesis are used in the dark phase?
15. For net synthesis of 1 G3P, the cycle must take place three times, fixing 3 molecules of _____.
16. What catalyzes carbon fixation?
17. Refer to lab manual pg 8-15 to answer questions.