BIOL 3200 – Cell Biology
Chapter 10 Assignment
DATE DUE: October 21, 2009 Name _____

1. What is the specific cellular location of each of the following processes?
    a. Glycolysis
    b. Pyruvate Oxidation
    c. TCA Cyle
    d. Electron Transport Chain

2. How many carbons does each of the following molecules contain?
    a. Citrate
    b. Isocitrate
    c. a-Ketoglutarate
    d. Acetyl CoA
    e. Malate
    f. Pyruvate

3. Although most amino acids must go through complicated conversion pathways, three can be converted directly into intermediates of the TCA cycle. **For each of these three listed below, calculate how many ATPs will be produced from its complete oxidation.** You will need to take into account its starting point in the TCA cycle, any ATPs that would be produced by substrate level phosphorylation, and any ATPs that will be produced from NADH and $FADH_2$. You may need to refer to your textbook or another source to determine how many APTs are produced from each NADH and each $FADH_2$. Be sure and show your work for each to get credit (don't just write down a number).

    a. Alanine

    b. Aspartate

    c. Glutamate

4. Fats (triglycerides) can also be oxidized by the cell for energy. Using strategies similar to those in question 3, calculate the total number of ATPs that would be produced from the complete oxidation of a fat molecule whose fatty acid chains are each 16 carbons long. Include ATPs that are made by substrate level phosphorylation as well as those eventually produced via NADH and $FADH_2$. Show your work to get credit.

5. Using your own words, compare electricity generation by a hydroelectric dam to ATP production in mitochondria.