Name _____

Chem 352 - Spring 2011
Quiz 5

1. The first reaction in fatty acid synthesis pathway is the synthesis of malonyl-CoA from acetyl-CoA
   a. *Using structural formulas*, write a *balanced chemical equation* for this reaction.

   b. What is the name of the enzyme that catalyzes this reaction? _____
   c. Which class of enzyme catalyzed reactions does the reaction belong to? _____
   d. Describe two characteristics of this reaction, which can include the role it plays in setting up the subsequent reaction in the pathway, that make it similar to the first reaction in gluconeogenesis, starting with pyruvate.
      i.

      ii.

2. *Using structural formulas*, write the *balanced chemical equation* for the reaction(s) leading to the synthesis of an amino acid from a glycolytic intermediate and the synthesis of an amino acid from a citric acid cycle intermediate.
   a. glycolytic intermediate:

   b. citric acid cycle intermediate:

3. Like carbohydrate catabolism, fatty acid catabolism results in the production of acetyl-CoA.

   a. Starting with lauryl-CoA (12:0), write the balanced chemical equations for the reactions in the *first round of β-oxidation*. Use structural formulas for the intermediates in the pathway; you may use R- to represent the the portion of the lauryl-CoA that is not directly involved in any of the reactions.

   b. Where in a eukaryotic cell does β-oxidation of fatty acids occur? _____

   c. Describe how the lauric acid in the cytosol of a eukaryotic cell is converted to lauryl-CoA and transferred to the location that you identified in part b.

   d. Estimate the total number of m ATP molecules that can be synthesized from ADP and P_i from the complete oxidation of myristic acid to CO_2 and H_2O, starting in the cytosol of a eukaryotic cell.

   _____