Name _____

Chem 352 - Spring 2009 - Quiz 4

Ideal Gas Law Constant, $R = 8.314 \times 10^{-3}$ kJ K^{-1} mol^{-1}; Faraday's constant, $\mathscr{F} = 96.48$ kJ V^{-1} mol^{-1}

1. Describe the distinguishing characteristic that is shared by members of the class of biological molecules called lipids.

2. Fatty acids are components of a variety of lipids having different functions. Name the class of lipids that fits each of the following descriptions:
   a. A major component of biological membranes that self assemble into lipid bilayers when suspended in aqueous solutions. _____
   b. A long-term storage form of chemical energy _____
   c. Prostaglandins are a member of this class. _____
   d. The gangliosides and cerebrosides are members of this group. _____

3. Corn oil and palm oil are both vegetable oils. At room temperature corn oil is a liquid while palm oil is a soft buttery solid. Explain the structural differences between these two oils that explains this difference.

4. In signal transduction, what role does cyclic-AMP (cAMP) play?

5. Draw the structural formula for the membrane phospholipid *phosphatidyl serine*, which contains the fatty acids oleate (18:1 Δ^9) at the C1 position, and palmitate (16:0) at the C2 position.

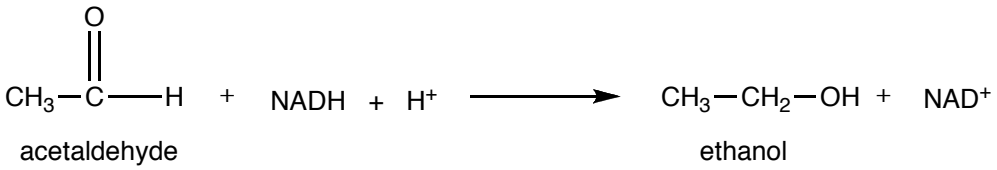
6. Describe the difference between the following pairs of terms:

   a. *active vs. passive* transport -

   b. *secondary vs. primary* transport -

   c. *symport vs. antiport* transport -

7. The second reaction in alcohol fermentation is the 2-electron reduction of acetaldehyde by NADH + H^+:



   a. If the standard reduction potential ($E^{o'}$) for the reduction of acetaldehyde to ethanol is -0.20 V, and that for the reduction of NAD^+ to NADH + H^+ is -0.32 V, what is the standard free energy change for this reaction? _____

   b. Is this reaction favorable under standard state conditions? _____
   Explain: