1. (a) (1 Point) What enzyme is used to convert fatty acid cis double bonds into trans double bonds so that the fatty acid can undergo -oxidation?

Answer: $\Delta^3, \Delta^2$ - enoyl CoA isomerase

(b) (2 Points) Draw the substrate and product for this enzyme

2.) (3 Points) -oxidation of odd numbered fatty acids produces the 3C-unit propionyl CoA. What three enzymes are used to convert propionyl CoS to succinyl Co so that it can enter into the citric acid cycle?

Answer: (1) propionyl CoA carboxylase  
(2) methyl malonyl CoA epimerase  
(3) methyl malonyl CoA mutase

3.) (a) (1 Point) When does the body produce ketone bodies?

Answer: under conditions of starvation and untreated diabetes

(b) (1 Point) What is the body's purpose for producing ketone bodies?

Answer: to be used by tissues, such as the brain, in place of glucose

4.) (2 Points) Write the overall reaction for the fatty acid synthase.

Answer: $8$ acetyl CoA $+ 7$ATP $+ 14$ NADPH $\rightarrow$ palmitate $+ 7$ ADP $+ 7$ Pi $+ 14$ NADP$^+$