Name: _____

Lab Quiz 05: Latent Heat of Fusion

Answer each of the following questions using the information you collected during the lab. Please submit your completed quiz before you leave the lab. No papers will be accepted after the end of the lab period.

1.   (21 points) Complete the table below using the measurements you recorded and the calculations you performed.

TRIAL	BEAKER MASS m_c (g)	BEAKER + WATER m_1 (g)	BEAKER + WATER + ICE m_2 (g)	MASS OF WATER m_w (g)	MASS OF ICE m_i (g)	INITIAL TEMP T_1 (°C)	FINAL TEMP T_2 (°C)	LATENT HEAT L (cal/g)
1								
2								
3								

2.   (3 points) Calculate the average latent heat, L_{av}, for the three trials you performed. Please show your work.

3.   (3 points) What is the **percent error** in this average value (**accepted value = 80 cal/g**)? Again, show your calculation.

4.   (2 points) Why were multiple trials of this experiment necessary?
   A)   They weren't. But the experiment did not take very much time to perform, so we had to keep doing it again and again just to use up the whole lab period.
   B)   The latent heat of water is not a constant. Every time you perform the experiment, there will be a different answer. Since you don't ever know what that number will be, you have to do the experiment many times.
   C)   The value for the latent heat is a constant, but the method we used allowed for significant random error. But since some values are low and others are high, the average value ends up being pretty accurate.
   D)   Because the temperature probe was extremely unreliable. It can only read the temperature once every few seconds, but to be accurate the temperature must be read continuously while the ice melts.

5.   (2 points) You performed three trials, and so did each of the other lab groups. What would have happened if you had combined your data with the data from the rest of the class, and calculated a single average value for the latent heat?
   A)   Nothing. There would have been no change in the average or the percent error.
   B)   Something. It is very probable that the combined average (of about 24 values) would have been closer to the actual value than any particular group's average of three values.
   C)   No way to know. Adding more values to a data set is a wild card. You never know! Probably not the best idea, just in case.

6.   (2 point) **True or false:** The graph of temperature as a function of time displayed while the ice melted was a straight line.

7.   (2 point) **True or false:** It requires less energy to melt 1g of solid ice into liquid water than it does to raise the temperature of 1g of liquid water by 1°C.