Name:

Date:

Unit C Test: Energy and Society

K/U /15	T/I /7	A /14	C /6

1) **What are the <u>three</u> ways that thermal energy can be transferred? Give an example of each type. [3 K]**

2) **A book with a mass of 1.45 kg gains 25.0 J of energy when it is lifted from the floor to a shelf. How high above the floor is the shelf? [2 K]**

3) **A skier with a mass of 65.0 kg increases her speed from 1.75 m/s to 4.20 m/s as she slides down a hill. What is the increase in her kinetic energy? [3 K]**

4) **What is an <u>isolated system</u>? Explain. [2K]**

5) **Draw a diagram which includes the three states of matter of water, and use arrows to show and label phase transitions (changes of state). [5K]**

6) **A 215 g mass of water at 4.00 C is allowed to warm to 22.1 C. The specific heat capacity of liquid water is 4190 J/(kg K). Determine the amount of thermal energy absorbed by the water. [4 A]**

7) **A roller coaster train and its passengers have a combined mass of 820 kg. The train comes over the top of the first hill, 85.0 m above the ground, with a speed of 0.200 m/s. The train goes down the first hill and up to the crest of the second hill, 64.0 m above the ground. Ignore the effects of frictional forces. What is the kinetic energy of the train at the top of the second hill? [6 A]**

8) **A vertical force of 1510 N acts to lift a crate with a mass of 48.6 kg to a height of 24.5 m above its original position.**
   a) **How much work did the force do on the crate? [2A]**
   b) **What was the gain in the crates gravitational potential energy? [2A]**

9) **A 2.65 kg piece of solid granite at 85.3 °C is immersed in 2.65 kg of water at 15.6 °C. The final temperature is 26.7 °C. The specific heat capacity of water is <u>4190 J/(kg K)</u>. Determine the specific heat capacity of this type of granite. [4T]**

   ***Recall that $Q_1 + Q_2 = 0$**

10) **When two materials are in contact, why is thermal energy transferred from the warmer material to the cooler material? [3T]**
***Think of KMT!**

11) **Describe a situation where the work done on an object is <u>negative</u>. [2C]**

12) **Explain why no work is done in each of these situations [4 C]**

a) A person carries a cup of coffee across the kitchen.

b) A puck slides across the ice at a constant speed (neglecting friction)