

Name \_\_\_\_\_

**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**

- 1) Energy that is associated with the position or composition of an object is called 1) \_\_\_\_\_  
A) chemical energy B) thermal energy  
C) potential energy D) kinetic energy
- 2) Energy that is associated with the relative positions of electrons and nuclei in atoms and molecules is called 2) \_\_\_\_\_  
A) chemical energy B) thermal energy  
C) potential energy D) kinetic energy
- 3) Energy that is associated with the temperature of an object is called 3) \_\_\_\_\_  
A) thermal energy B) kinetic energy  
C) potential energy D) chemical energy
- 4) Which of the following signs on  $q$  and  $w$  represent a system that is doing work on the surroundings, as well as losing heat to the surroundings? 4) \_\_\_\_\_  
A)  $q = -$ ,  $w = -$   
B)  $q = -$ ,  $w = +$   
C)  $q = +$ ,  $w = +$   
D)  $q = +$ ,  $w = -$   
E) None of these represent the system referenced above.
- 5) For  $\Delta E_{\text{SYS}}$  to always be  $-$ , what must be true? 5) \_\_\_\_\_  
A)  $+w > -q$  B)  $-w > +q$  C)  $q = w$  D)  $+q > -w$
- 6) Define heat capacity. 6) \_\_\_\_\_  
A) the quantity of heat required to lower the temperature of 1 mole of a substance by  $1^{\circ}\text{C}$   
B) the quantity of heat required to raise the temperature of 1 g of a substance by  $1^{\circ}\text{F}$   
C) the quantity of heat required to lower the temperature of 1 gram of a substance by  $1^{\circ}\text{C}$   
D) the quantity of heat required to lower the temperature of 1 liter of a substance by  $1^{\circ}\text{C}$   
E) the quantity of heat required to change a system's temperature by  $1^{\circ}\text{C}$
- 7) Define specific heat capacity. 7) \_\_\_\_\_  
A) the quantity of heat required to change a system's temperature by  $1^{\circ}\text{C}$   
B) the quantity of heat required to raise the temperature of 1 gram of a substance by  $1^{\circ}\text{C}$   
C) the quantity of heat required to lower the temperature of 1 liter of a substance by  $1^{\circ}\text{C}$   
D) the quantity of heat required to lower the temperature of 1 gram of a substance by  $1^{\circ}\text{F}$   
E) the quantity of heat required to lower the temperature of 1 mole of a substance by  $1^{\circ}\text{C}$
- 8) Given  $w = 0$ , an endothermic reaction has the following. 8) \_\_\_\_\_  
A)  $+\Delta H$  and  $-\Delta E$  B)  $-\Delta H$  and  $-\Delta E$  C)  $+\Delta H$  and  $+\Delta E$  D)  $-\Delta H$  and  $+\Delta E$

9) A 50.0-g sample of liquid water at 25.0°C is mixed with 29.0 g of water at 65.0°C. The final temperature of the water is \_\_\_\_\_°C. 9) \_\_\_\_\_

10) The temperature rises from 25.00°C to 29.00°C in a bomb calorimeter when 3.50 g of sucrose undergoes combustion in a bomb calorimeter. Calculate  $\Delta E_{\text{rxn}}$  for the combustion of sucrose in kJ/mol sucrose. The heat capacity of the calorimeter is 4.90 kJ/°C. The molar mass of sugar is 342.3 g/mol. 10) \_\_\_\_\_

11) Explain the difference between  $\Delta H$  and  $\Delta E$  (mathematically and conceptually) 11) \_\_\_\_\_

## Answer Key

Testname: QUIZ 6.1-6.6 (A), WITHOUT STOICHIOMETRY

- 1) C
- 2) A
- 3) A
- 4) A
- 5) B
- 6) E
- 7) B
- 8) C
- 9) 39.7
- 10)  $-1.92 \times 10^3$  kJ/mole
- 11) Change in enthalpy ( $\Delta H$ ) only tracks the exchange of heat between a system and its surroundings. Internal energy change ( $\Delta E$ ) tracks both heat and work exchanged between a system and its surroundings.