Practice Problems Section 5.1 and 5.2

1) The internal energy of a system \_\_\_\_\_\_\_\_\_\_.

A) is the sum of the kinetic energy of all of its components

B) is the sum of the rotational, vibrational, and translational energies of all of its components

C) refers only to the energies of the nuclei of the atoms of the component molecules

D) is the sum of the potential and kinetic energies of the components

E) none of the above

2) The ΔE of a system that releases 12.4 J of heat and does 4.2 J of work on the surroundings is \_\_\_\_\_\_\_\_\_\_ J.

A) 16.6

B) 12.4

C) 4.2

D) -16.6

E) -8.2

3) The internal energy of a system is always increased by \_\_\_\_\_\_\_\_\_\_.

A) adding heat to the system

B) having the system do work on the surroundings

C) withdrawing heat from the system

D) adding heat to the system and having the system do work on the surroundings

E) a volume compression

4) When a system \_\_\_\_\_\_\_\_\_\_, ΔE is always negative.

A) absorbs heat and does work

B) gives off heat and does work

C) absorbs heat and has work done on it

D) gives off heat and has work done on it

E) none of the above is always negative.

5) Which one of the following is an endothermic process?

A) ice melting

B) water freezing

C) boiling soup

D) Hydrochloric acid and barium hydroxide are mixed at 25 °C: the temperature increases.

E) Both A and C

6) Which one of the following is an exothermic process?

A) ice melting

B) water evaporating

C) boiling soup

D) condensation of water vapor

E) Ammonium thiocyanate and barium hydroxide are mixed at 25 °C: the temperature drops.

7) Of the following, which one is a state function?

A) H

B) q

C) w

D) heat

E) none of the above

8) Which of the following is a statement of the first law of thermodynamics?

A)Ek= ½ mv2

B) A negative ΔH corresponds to an exothermic process.

C) E= Efinal-Einitial

D) Energy lost by the system must be gained by the surroundings.

E) 1 cal = 4.184 J (exactly)

9) The ΔE of a system that releases 12.4 J of heat and does 4.2 J of work on the surroundings is \_\_\_\_\_\_\_\_\_\_ J.

A) 16.6

B) 12.4

C) 4.2

D) -16.6

E) -8.2

10) The value of ΔE for a system that performs 213 kJ of work on its surroundings and loses 79 kJ of heat is \_\_\_\_\_\_\_\_\_\_ kJ.

A) +292

B) -292

C) +134

D) -134

E) -213