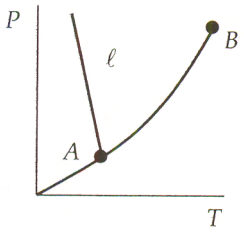
1. Select the best response for an isolated system
   (A) The entropy of system remains constant.
   (B) The heat transfer equals the work done.
   (C) The heat transfer equals the internal energy change.
   (D) The heat transfer is zero.

2. When one system interacts with another system which of the following is possible?
   (A) Internal energy can be transferred from one system to the other.
   (B) Entropy can be transferred from one system to the other.
   (C) One system can induce a force on the other system.
   (D) Temperature can be transferred from one system to the other.

3. The pressure-temperature diagram for water is shown. The names for points A and B and line *l* are, respectively:
   (A) triple, critical, fusion
   (B) critical, triple, sublimation
   (C) triple, critical, sublimation
   (D) critical, triple, fusion



4. A tank contains 0.02 m^3 of liquid and 1.98 m^3 of vapor. If the density of the liquid is 960 kg/m^3 and that of the vapor is 0.5 kg/m^3, what is the quality of the mixture?
   (A) 5.2%
   (B) 4.9%
   (C) 2.04%
   (D) 1.01%

5. Two kilograms of air are contained in a cylinder. If 80 kJ of heat are added to the air, estimate the temperature rise if the pressure is held constant. $c_p = 1.0$, $c_v = 0.716$ kJ/kg-K, $k = 1.4$
   (A) 56 °C
   (B) 40 °C
   (C) 33 °C
   (D) 28 °C

6. Clothes are hung out to dry in very cold weather. The water in the clothes freezes, but a day later when the clothes are brought inside they are dry. By what process did the drying occur?
   (A) vaporization
   (B) condensation
   (C) evaporation
   (D) sublimation

7. Air is compressed in an ideal, adiabatic compressor from 100 kPa and 20°C to 800 kPa. What is the temperature at the compressor exit? $k = 1.4$.
   (A) 1440 °C
   (B) 368 °C
   (C) 258 °C
   (D) 167 °C

8. Vapor refrigerant enters and liquid refrigerant leaves the coils on the back of the refrigerator. These coils are the:
   (A) evaporator
   (B) intercooler
   (C) reheater
   (D) condenser

9. Steam at high temperature and pressure passes through a half open globe valve. Select the property that remains constant through the valve.
   (A) enthalpy
   (B) temperature
   (C) pressure
   (D) entropy

10. A 2.5-cm thick substance has a thermal resistance of 2.0 hr-m-°C/kJ. Estimate the heat transferred in 15 minutes through a 3 m by 8 m wall if the inside and outside temperatures are -10 °C and 25 °C, respectively.
   (A) 6300 kJ
   (B) 5400 kJ
   (C) 4800 kJ
   (D) 4200 kJ