KSU – Chemical Engineering Department
ChE 304 (Thermodynamics) – TUT #1
Name: **ID:** **SN:**

1. Model the following as closed or open system:
   a. Piston-cylinder system with a moving boundary
   b. A compressor
   c. Water heater

2. The mass of a system is 1 kg, and its volume is 1 L, at T = 30 ^{o}C, and P = 1 atm, has been divided into two equal parts. What would be the mass, volume, T, and P of each part?

3. A system is initially at 18 ^{o}C, and its temperature increases by 15 ^{o}C. Express the initial temperature and the rise in temperature K.

4. Consider two closed systems A (with thermal energy of 3000 kJ, at 20 ^{o}C) and B (thermal energy 200 kJ, at 50 ^{o}C). The systems are brought into contact with each other. Determine the direction of heat transfer between them.

5. The absolute pressure in water at a depth of 5 m is 145 kPa. Determine (a) the local atmospheric pressure, and (b) the absolute pressure at a depth of 5 m in a liquid whose specific gravity is 0.85 at the same location.