MEMS 0051 - Introduction to Thermodynamics
Quiz #1

Name: _____

Problem #1

A force of 100 [N] is applied to an area of 2 [m^2]. What is the pressure applied to that area?

$$P = \frac{F}{A} = \frac{100\,[\text{N}]}{2\,[\text{m}^2]} = 50\,[\text{Pa}]$$

Problem #2

The density of a liquid is 1,000 [kg/m^3]. What is the specific volume of that liquid?

$$\nu = \frac{1}{\rho} = \frac{1}{1,000[\text{kg/m}^3]} = 0.001\,[\text{m}^3/\text{kg}]$$

Problem #3

Determine if the following property is intensive or extensive:

1. Temperature - Intensive
2. Volume - Extensive
3. Specific volume - Intensive

Problem #4

Answer the following questions about the air compressor shown below. Note that the control surface is denoted with a dashed line. 1-2 word answers are fine.

- Is the given control volume a closed or open system? - Open
- Is the air flowing through this compressor undergoing a process or cycle? - Process
- Assume we know the pressure of the air entering the compressor. Do we know the state if we know that property? - No, two properties are needed to define a state

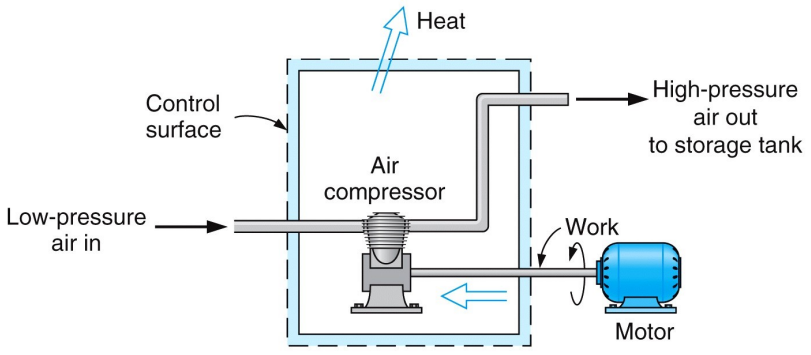

Figure 1.5