

Quiz 1

This is a closed book quiz. You may use your Properties Booklet. An equation sheet will be provided.

1. (6 pts) In classical thermodynamics energy can be stored in a system as:

- 1.
- 2.
- 3.

2. (4 pts) . . . and transferred into/out of the system as:

- 1.
- 2.

3. (10 pts) Determine the kinetic energy of a 100 kg mass moving with a velocity of 50 m/s in kJ.

4. (5 pts) Determine the force required in lb_f to accelerate 10 lb_m at a rate of 5 ft/s^2 .
(Note $g_c = 32.2 \text{ lb}_m\text{ft}/\text{lb}_f\text{s}^2$)

5. (25 pts) Complete the following table for water:

No.	T in C	p in kPa	v in m ³ /kg	phase
1.	100	5000		
2.		200	0.70	
3.	120			saturated vapor
4.	400	4750		

6. (5 pts) Determine the quality of the water in No. 2 in the table above.

7. (45 pts) A rigid vessel contains 58 kmoles of air at 150 kPa and 30 C. It is heated until the pressure doubles to 300 kPa. Determine the initial density of the air in the vessel in m^3/kg and the final temperature in K. (Note: $MW_{\text{air}} = 29$)