INSTRUCTIONS

- This is an open book and open notes exam. You cannot use any internet resources or cannot communicate with other students during the exam.
- There is a 24-hour window between 9:00 am EDT Tuesday, April 14, 2020, and 8:59 am EDT on Wednesday, April 15, 2020, all West Lafayette times, to complete this exam.
- This is a 60-minute exam that must be completed within a 90-minute time period. Once you start the exam and exit it, you will not be able to reenter the exam.
- This exam includes 10 multiple choice questions, 5 points each, and 5 questions that need fill in numerical answers, 10 points each. You won't be able to show work, and there will be no partial credit.
- Piazza will be shut down during the 24-hour window of Exam 3, and questions cannot be answered during the exam. If you have a question during the exam, write an email to your instructor and this input will be factored in when your exam is graded.
- All needed tables are provided on the next page or within individual problem statements. In this exam, you **should interpolate** in property tables, as needed, to obtain your final result.
- All specified pressures are "absolute" pressures

I certify by submitting this exam within Blackboard that I have not received, I have not given, nor will I give or receive, any assistance from any source including the internet or with another student, including discussing and exchanging information about the exam with any student. All the work on this exam is my own. I understand that acts of academic dishonesty may be penalized to the full extent as described in the ME 200 Course Policy, item 13. Academic Integrity

Ideal Gas Properties for Air – R_{air}=0.287 kJ/(kgK)

Temp. [K]	h [kJ/kg]	u [kJ/kg]	s° [kJ/kg/K]	p_r	v_r
250	250.0	178.3	1.520	0.7329	979.0
300	300.1	214.1	1.703	1.3860	621.2
310	310.2	221.2	1.736	1.5546	572.3
320	320.2	228.4	1.768	1.7375	528.6
330	330.3	235.6	1.799	1.9352	489.4
340	340.4	242.8	1.829	2.149	454.1
350	350.5	250.0	1.858	2.379	422.2
360	360.6	257.2	1.886	2.626	393.4
370	370.7	264.4	1.914	2.892	367.2
380	380.8	271.6	1.941	3.176	343.4
390	390.9	278.9	1.967	3.481	321.5
400	401.1	286.1	1.993	3.806	301.6
450	452.0	322.6	2.113	5.775	223.6
500	503.3	359.5	2.221	8.411	170.6
550	555.0	396.9	2.319	11.86	133.1
600	607.2	434.8	2.410	16.28	105.8
650	660.0	473.2	2.495	21.86	85.34
700	713.3	512.3	2.574	28.80	69.76
750	767.3	552.0	2.648	37.35	57.63
800	821.9	592.3	2.719	47.75	48.08
850	877.1	633.2	2.786	60.28	40.45

R134a SHV Properties

Temp (C)	Volume (m³/kg)	Internal Energy (kJ/kg)	Enthalpy (kJ/kg)	Entropy (kJ/kg/K)		Temp (C)	Volume (m³/kg)	Internal Energy (kJ/kg)	Enthalpy (kJ/kg)	Entropy (kJ/kg/K)
	p = 5.0 bar = 0.50 MPa, T_{sat} = 15.74°C						p = 16.0 bar = 1.60 MPa, T_{sat} = 57.91°C			
Sat.	0.041123	238.77	259.33	0.92408		Sat.	0.012126	258.50	277.90	0.90795
10						60	0.012373	260.90	280.69	0.91636
20	0.042116	242.40	263.46	0.93829		70	0.013430	271.76	293.25	0.95351
30	0.044338	250.84	273.01	0.97033		80	0.014362	282.09	305.07	0.98747
40	0.046456	259.26	282.49	1.0011		90	0.015216	292.17	316.52	1.0194
50	0.048499	267.72	291.97	1.0309		100	0.016015	302.14	327.77	1.0500
60	0.050486	276.26	301.50	1.0599		110	0.016773	312.08	338.91	1.0795
70	0.052427	284.89	311.10	1.0883		120	0.017500	322.02	350.02	1.1081
80	0.054331	293.64	320.81	1.1162		130	0.018201	332.00	361.13	1.1360
90	0.056205	302.51	330.61	1.1436		140	0.018882	342.05	372.26	1.1633
100	0.058054	311.50	340.53	1.1705		150	0.019546	352.17	383.45	1.1900
110	0.059880	320.63	350.57	1.1971		160	0.020194	362.39	394.70	1.2163