

Exam 1

Saturday, March 6, 2021 1:33 PM

"I pledge my honor I have abided by the Stevens Honor system."

- Alex J. Adams

1.) Using Table $T = 67.45$
(Vapor mixture)

$$\begin{aligned} 2.) \quad u_g &= u_f + x u_{fg} \\ 2000 &= 1642.4 + x(775.9) \quad (@ 350^\circ\text{C}) \\ x &= .461 \end{aligned}$$

$$\begin{aligned} 3.) \quad u_g &= u_f + x u_{fg} \quad (@ 2500 \text{ kPa}) \\ \text{if } x &= 1; \\ u_g &= \text{answer} \\ u_g &= 2602.1 \end{aligned}$$

4.) Using table A-12E

5.) Superheated water

$$x = N/A$$

6.)

$$h = 100$$

$$(\text{a}) 30^\circ\text{F}$$

$$100 = 21.643 + x(85.772)$$

$$x = .9135$$

7.)

$$PV = nRT$$

$$P_{\text{tot}} = P_{\text{atm}} + P_m$$

$$P_{\text{atm}} = 101.325$$

$$P = 601.325 \times 10^3 \text{ Pa}$$

$$n = \frac{PV}{RT}$$

$$R = 259.812 \frac{\text{J}}{\text{kg} \cdot \text{K}}$$

$$n = \frac{(601325)(2.5)}{(259.812)(301)}$$

$$T = 28 + 273$$

$$T = 301 \text{ K}$$

$$m = 19.22 \text{ kg}$$

8.)

$$P_{\text{gage}} = \rho g h$$

$$P_{\text{gage}} = 1000 (9.81) (.8)$$

$$P_{\text{gage}} = 7848 \text{ Pa or } 7.848 \text{ kPa}$$