

2/23/2006

FABE 325	Instructor:Dr. Kaletunç TA : Kerry Zwierschke
<u>Homework #6</u>	Winter 2006

Homework Due Wednesday 2/29/2006 by 5pm

- 1) Text book 9.3-6
- 2) Text book 9.3-7
- 3) Text book 9.3-9
- 4) Text book 9.3-10
- 5) Air with a dry bulb temperature of 14 °C, a wet bulb temperature of 9 °C and a dry air mass flow rate of 0.02 kg/s, is mixed with an air stream with corresponding values of 42 °C, 32 °C, and 0.04 kg/s. respectively. Determine graphically and by calculation, the humidity of the mixed stream.
- 6) Why is air heated before it is introduced into greenhouse or young-livestock building environments? This practice is known as winter ventilation. Draw a psychrometric chart to explain your answer.
- 7) Water exiting the condenser of a power plant at 45°C enters a cooling tower with a mass flow rate of 15000 kg/s. A stream of cooled water is returned to the condenser from the cooling tower with the same flow rate. Make-up water is added in a separate stream at 20 °C. Atmospheric air enters the cooling tower at 30 °C with a wet bulb temperature of 20 °C. The volumetric flow rate of moist air into the cooling tower is 8000 m³ /s. Moist air exits the tower at 40 °C and 90% relative humidity. Assume an atmospheric pressure of 101.3 kPa.

Determine:

- a) the mass flow rate of dry air,
- b) the mass flow rate of make-up water,
- c) the temperature of the cooled liquid water exiting the cooling tower.