بسم الله الرحمن الرحيم

King Abdulaziz University
Mechanical Engineering
Thermal Eng. & Desal. Tech. Dept.

MEP451 Ref. & AC
Spring 2011.
HW. # 01
Unit conversion

1-Convert the following quantities from English to SI units. Indicate the physical parameter that each unit represents

a) 130 Btu/(hr.ft.°F)	b) 0.32 Btu/(lbm.°F)	c) 0.3 lbm/(ft.hr)
d) 3000 Btu/lbm	e) 32 tons of refrigeration	f) 32.2 lbf/in^2
g) 3222 CFM	h) 300 HP	i) P=3 inches of water (gage)
j) T=73 °F	k) ΔT=32 °F	

2- Convert each of the following from SI to English units. Also indicate what each unit represents

a) 50 kg	b) 5 m^3	c) 500 N
d) 503.3 kPa	e) 5300 kJ/kg	f) 53 kW
g) 5.33 kJ/(kg.K)	h) 533 l/s	i) 500 kg/m^3
j) 35 $W/(m^2.°C)$		

3-Consider air as an ideal gas at 75 °F, and a pressure of 12 psi. Determine the density of air in lbm/ft^3 using English units. Then convert the temperature and pressure into SI unit, and using the ideal gas equation of states in SI units to find the air specific volume in m^3/kg.

4-Liquid water at 72° C is to be cooled to 52° C using atmospheric dry air. Air enters the heat exchanger at 32° C and leaves at 42° C. If the mass flow rate of water is 0.15 kg/s. Determine the mass and volumetric flow rates of air entering the heat exchanger?

5-5000 CFM of dry air is to be cooled from 82° F to 42° F in a heat exchanger. Determine the amount of heat that must be removed from air in Btu/hr and tons.

6-A chiller of 7.5 tons capacity is used to chill water. The water enters at 52 °F and leaves at 42 °F. Determine the mass flow rate of water through the chiller.