BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, Pilani

APPLIED THERMODYNAMICS

TUTORIAL 1

Dated 3.8.2016 **Time: 50 Mins**

Q. 1 Briefly Recap of thermodynamics basics, Saturation Temperature, Saturation Pressure, Saturated Liquid-Vapor Mixture etc.

Q. 2 Discuss the use of Thermodynamics Tables, Mollier Diagram for Water.

Q. 3 Example 3.9 (Page 133, TB1).

Determine the missing properties and the phase descriptions in the following table for water:

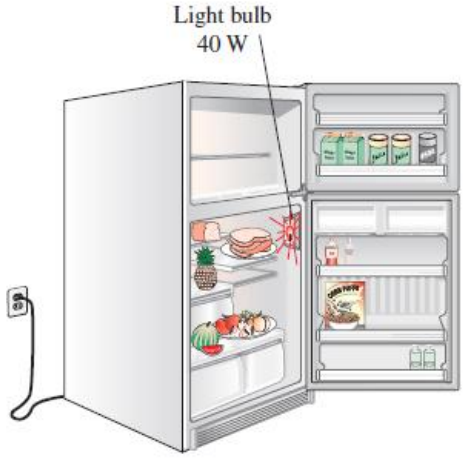
	T ^{o}C	P, kPa	u, kJ/kg	x	Phase description
(a)		200		0.6	
(b)	125		1600		
(c)		1000	2950		
(d)	75	500			
(e)		850		0.0	

Q. 4 Problem 3.51(Page 155, TB1) Unsolved.

Superheated water vapor at 1.4 MPa and 250^{o}C is allowed to cool at constant volume until the temperature drops to 120^{o}C. At the final state, determine (a) the pressure (b) the quality (c) the enthalpy. Also show the process on a T-V diagram with respect to saturation lines.

Q. 5 Example 6-8 TB1 Page 310

The interior lighting of refrigerators is provided by incandescent lamps whose switches are actuated by the opening of the refrigerator door. Consider a refrigerator whose 40-W light bulb remains on continuously as a result of a malfunction of the switch (Fig). If the refrigerator has a coefficient of performance of 1.3 and the cost of electricity is 12 cents per kWh, determine the increase in the energy consumption of the refrigerator and its cost per year if the switch is not fixed.



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