Basic Mechanical Engineering

CSE/IT/Civil Engineering

PROPERTIES OF STEAM

1. Explain the formation of steam with the help of *temperature – specific volume or heat added* diagram also indicate sub-cooled, wet and superheated zone.
2. **Define / explain the following**
   - Saturation Pressure, Saturation temperature, saturated liquid, saturated vapour, critical point and dryness fraction of the steam.
3. What is steam table? Explain its need and use briefly.
4. Which are the different properties of the steam? Derive the relations to compute these properties from the steam table for sub cooled liquid, wet steam and superheated steam.

Solve the Problems with the help of steam table.

1. Calculate the specific volume and the specific enthalpy of steam at 35% quality and pressure of 20kPa.
2. Steam at 550kPa and quality 92% occupies a rigid vessel of 0.4m3. Calculate the mass, internal energy and enthalpy
3. A closed rigid vessel contains 125g of liquid and 7.5g of water vapor in equilibrium at 0.5Mpa. Determine the volume of the mixture.
4. A rigid tank of volume 1 m3 contains saturated steam at 100 kPa. If you cool the water to T=90º C calculate the quality of the new mixture.
5. Calculate the mass of 15m3 of water (mixed phase liquid-vapor) at 500kPa and quality of 50%.
6. A closed rigid vessel contains 50g of liquid water and 50g of water vapor in equilibrium at 0.1Mpa.