ASSIGNMENT

UNIT –III

**Q1** what do you understand by high grade energy and low grade energy? Deduce the expression or available energy from a finite energy source at temperature T When the environmental temperature is T.

**Q2.** Derive Maxwell’s equation.

**Q3.** Give the Gibbs phase Rule for a non reactive system

**Q4**. Explain Joule Kelvin Effect. What is Inversion Temperature?

**Q5.** Derive the following expression

TdS=Cp dT - T(∂V**/**∂T)p dp

**Q6**. Derive an expression for clausius clapeyron equation.

**Q7**. Derive an expression for Joule Thomson coefficient.

Q.8 Calculate the enthalpy of I kg of steam at a pressure of 8 bar and dryness fraction of 0.8.

 How much heat would be required to raise 2 kg of this steam from water at 20o C.

Q.9 Steam enters an engine at a pressure of 12 bar with a 67° C of superheat. It is exhausted at a pressure of 0.15 bar and 0.95 dry. Find the drop in enthalpy of the steam.

Q.10 A steam engine obtains steam from a boiler at a pressure of 15 bar and 0.98 dry. It was observed that the steam loses 21 kJ of heat per kg as it flows through the pipeline, pressure remaining constant. Calculate dryness fraction of the steam, at the engine end of the pipeline.

Q.11 A boiler is supplied with feed water at a temperature of 45oC. The water is converted into steam at pressure of 5.5 bars and a temperature of 188o C. Determine the quantity of heat supplied per kg of steam. Assume suitable data.

Q.12 Find the external work done during evaporation per kg of steam at a pressure of 15 bar when the steam is (a) 90% dry and (b) dry saturated.

Q.13 Calculate the internal energy of 1 kg of steam at a pressure of 10 bar when the steam is: (a) 0.9 dry; and (b) dry saturated. The volume of water may be neglected*.*