**REG.NO:**

**SEMBODAI RUKMANI VARATHARAJAN ENGINEERING COLLEGE**

**ACADEMIC YEAR 2013-2014/ODD SEMESTER**

**CYCLE TEST – II DEPARTMENT OF MECHANICAL ENGINEERING**

**SUBJECT CODE/TITLE:** ENGINEERING THERMODYNAMICS

**YEAR/SEM:** II/III **DATE:**

**DURATION:** 1 ½ HOURS **MAX.MARKS:** 50

**Answer ALL the Questions**

**PART A (5X2=10)**

1. Define latent heat of evaporation?
2. Define the terms ‘Boiling point’ and ‘Melting point’
3. State phase rule of pure substances?
4. Draw the skeleton p-V diagram of water?
5. What are Maxwell relations?

**PART B (40 MARKS)**

1. A steam turbine receive is 600 kg/h of steam at 25 bar, 350oC. At a certain stage of the turbine, steam at the rate of 150 kg/h is extracted at 3 bar, 200oC. The remaining steam leaves the turbine at 0.2 bar, 0.92 dry. During the expansion process there is heat transfer from the turbine to the surroundings at the rate of 10 kJ/s. Evaluate per kg of steam entering the turbine

(a) The availability of steam entering and leaving the turbine

(b) The maximum work and

(c) The irreversibility. The atmosphere is at 30oC.

1. i) Derive Vander Waal’s equation in terms of reduce parameters. (8)

ii) Derive Tds equations taking temperature, volume and pressure as independent properties. (8)

1. A fluid at 250oC and 300 kPa is compressed reversibly and isothermally to 1/6th of its original value. Find the final pressure, the work done and the change of internal energy per kg of fluid, if the fluid in steam.