**REG.NO:**

**SEMBODAI RUKMANI VARATHARAJAN ENGINEERING COLLEGE**

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

**CYCLE TEST – I AUG-2013**

**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. Differentiate closed and open system.
2. State the First law of thermodynamics.
3. What is Quasi – Static process?
4. State the Kelvin – Plank statement of second law of thermodynamics
5. What do you mean by “Calusius inequality”?

**PART B (40 MARKS)**

1. i) In a gas turbine the gas enters at the rate of 5 kg/s with a velocity of 50 m/s and enthalpy of 900 kJ/kg and levels the turbine with a velocity of 150 m/s and enthalpy of 400 kJ/kg. The loss of heat from the gases to the surroundings is 25 kJ/kg. Assume for gas R=0.285 kJ/kg K and cp = 1.004 kJ/kg K and the inlet conditions to be at 100 kPa and 27oC. Determine the power output of the turbine and the diameter of the inlet pipe. (10)

ii) Differentiate Intensive and Extensive properties. (4)

iii)What do you understand by equilibrium of a system? (2)

1. A reversible heat engine operating between reservoirs at 900k and 300k drives a reversible refrigerator between reservoirs at 300k and 250k. The heat engine receives 1800kJ heat from 900k reservoir. The net output from the combined engine refrigerator is 360kJ.
2. Find the heat transfer to the refrigerator and the net heat rejected to the reservoir at 300k.
3. Reconsider (a) given that the efficiency of the heat engine and the COP of the refrigerator are each 40% of their maximum possible values.
4. Write short notes on availability and entropy. (8)