II B. Tech I Semester Supplementary Examinations, May - 2019
THERMODYNAMICS
(Com to ME, AE and AME)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

~~~~~~

Steam tables to be supplied

PART –A

1. a) What do you understand by the ideal gas temperature scale (3M)
b) What is a PMM1? Why is it impossible? (2M)
c) What is a heat pump? How is it differ from refrigerator? (3M)
d) What is meant by superheated vapour? (2M)
e) What is meant by specific humidity? (2M)
f) What is meant by mean effective pressure? (2M)

PART –B

2. a) Explain the working principle of thermo-electric thermometer with neat sketch. (7M)
b) Explain the zeroth law of thermodynamics with neat sketch. Explain how it is important in establishing the temperature scale (7M)

3. An adiabatic diffuser is employed to reduce the velocity of stream of air from 238 m/s to 50.4 m/s. The inlet pressure is 1.02 bar and the inlet temperature is 394^0C.Determine the final pressure and the required outlet area if the mass flow rate is 6.84 kg/s (14M)

4. a) What do you understand by entropy principle? (7M)
b) Show that the efficiency of a reversible engine operating between the two given constant temperatures is maximum (7M)

5. In a steam engine cylinder, dry and saturated steam expands from 22 bar to 2 bar isothermally. Calculate (a) change in enthalpy (b) change in internal energy (c) Change in entropy (d) Heat transferred (e) work done. Assume the non-flow process in the cylinder (14M)

6. a) Explain Dalton’s law of additive pressures (7M)
b) What is adiabatic saturation process? Explain the thermodynamic wet bulb temperature? (7M)

7. An air standard Otto cycle operates with a compression ratio 8.5.At the beginning of the compression the air is at 1 bar and 32^0C, and during the heat addition process the pressure is tripled. Calculate (a) the thermal efficiency of the cycle and (b) the efficiency of the Carnot engine operating between the same overall temperature limits. (14M)
~~~~~~