

KERALA AGRICULTURAL UNIVERSITY

B.Tech.Food Engg. 2013 Admission
One Time Re-examination-January 2017

Cat. No: Meen.1203

Title: Engineering Thermodynamics(2+1)

Marks: 50

Time : 2 hours

I. Fill up the blanks/True of False

(10 x 1=10)

1. In an irreversible process, there is no loss of heat.(T/F)
2. With increase in pressure the enthalpy of dry saturated steam decreases.(T/F)
3. A system comprising a single phase is called as -----
4. The temperature of air as registered by an ordinary thermometer is called as -----
5. The difference between the dry bulb and dew point temperatures is called as -----
6. The difference between the superheated temperature and the saturation temperature at the given pressure is called -----
7. Gas constant is equal to the -----of two specific heats.
8. The latent heat of vapourisation at critical point is equal to -----
9. One joule is equal to ----- Nm.
10. The temperature at which the volume of a gas becomes zero is called as -----

II. Write short notes/answers on ANY FIVE:

(5x 2=10)

1. What is triple point?
2. Find the specific volume, enthalpy and internal energy of wet steam at 18 bar. The dryness fraction is 0.9.
3. What do you mean by Clausius inequality?
4. Define relative efficiency and air-standard efficiency.
5. What advantages are obtained if superheated steam is used in steam prime movers?
6. State Boyle's law and Charle's law.
7. Define equation of state.

III Write answers on ANY FIVE:

(5 x 4=20)

1. A carnot engine working between 400°C and 40°C produces 130 kJ of work. Determine (a) Engine thermal efficiency (b) Heat added and (c) Entropy changes in the heat rejection process.
2. One kg of gaseous CO_2 contained in a closed system undergoes a reversible process of constant pressure. During this process 42 kJ of internal energy is decreased. Determine the work done during this process.
3. The volume of a high altitude chamber is 40m^3 . It is put into operation by reducing pressure from 1 bar to 0.4 bar and temperature from 25°C to 5°C . How many kg of air must be removed from the chamber during the process.
4. Discuss briefly about Diesel cycle.
5. Discuss in detail about the properties of steam.

6. What amount of heat would be required to produce 4.4 kg of steam at a pressure of 6 bar and temperature of 250°C from water at 30°C ? Take specific heat of super heated steam as 2.2 kJ/kg K .

7. Write short notes on second law of thermodynamics.

IV. Write essay on any ONE

(1 x 10=10)

1. Discuss at length about the PVT diagram on phase change describing its significance and its parameters.
2. Discuss in detail about Constant volume or Otto cycle with the help of suitable sketches.
