KERALA AGRICULTURAL UNIVERSITY

B.Tech (Food Engg.) 2011 Admission

IInd Semester Final Examination, July/August 2012

Cat. No Meen.1203 **Marks: 80**

Title: Engineering Thermodynamics (2+1) **Time: 3hours**

I. Fill up the blanks (10x1 = 10)

1. The internal energy of a perfect gas is a function of _____ only.
2. The process which can be described approximately by the equation pV^n = constant, where 'n' is a constant is called _____.
3. The entropy of water at 0°C is assumed to be _____.
4. The characteristic equation of a gas is _____.
5. The air standard efficiency of Otto cycle is given by the expression _____.
6. The enthalpy of wet steam is given by 'h' = _____.
7. Atmospheric pressure is equal to _____ of Hg.
8. Throttling process is a _____ type process.
9. Thermo couple is working based on the principle of _____ effect.
10. _____ cycle is most efficient, when operating between the same temperature limits.

II. Write short notes on ANY TEN (10x3 = 30)

1. Define macroscopic system.
2. Define mechanical equilibrium.
3. What is Quasi – static process?
4. State Zero'th law of thermodynamics.
5. Define entropy.
6. Define sublimation.
7. What is steam table?
8. Define latent heat of vapourization.
9. Define critical temperature of a substance.
10. Define saturated steam.
11. Represent a double acting single cylinder reciprocating compressor with a neat sketch.
12. Differentiate intensive and extensive properties.

III. Write short essays on ANY SIX (6x5 = 30)

1. Define Charl's law with neat sketch.
2. Explain the relation between heat and entropy.
3. Plot Otto cycle on temperature-entropy diagram.
4. Write on constant pressure process with P-V-T relationship.
5. Sketch the T-S diagram of a Stirling cycle.
6. Mention the important applications of compressed air in engineering.
7. List the assumptions in thermodynamic cycle.
8. 1 kg of gas expands adiabatically and its temperature is observed to fall from 240°C to 115°C while the volume is doubled. The gas does 89.947 kJ of work in the process. Determine the values of Cp and Cv.

IV. Write essay on ANY ONE (1x10 = 10)

1. Explain the expression for efficiency of diesel cycle with neat sketch.

2. Derive the following parameters for an Isentropic process.
   a. P-V-T relationship
   b. Work done during adiabatic expansion
   c. Change in internal energy
   d. Heat supplied
   e. Change in enthalpy.