KERALA AGRICULTURAL UNIVERSITY

B.Tech (Food.Engg) 2011 Admission
IInd Semester Special Re- Examination- June -2015

Cat. No: Meen.1203   Marks: 80.00
Title: Engineering Thermodynamics (2+1)   Time: 3 hours

I. Fill up the blanks / state True or False/ define   [10x1=10]

1. An open system is one in which both ---------- and ---------------cross the boundaries of the system.
2. Work done in a free expansion process is ------------.
3. The internal energy of a system is a function of -------------.
4. The heat content of a system is called ----------------.
5. Carnot cycle consist of two isothermals and two isentropics.
6. Kelvin plank's law deals with conversion of heat into work.
7. Heat and work are path function.
8. Define closed system.
9. Define zeroth law of Thermodynamics.
10. Define enthalpy.

II. Write short notes/answer on ANY TEN.   [10x3=30]

1. Distinguish between a closed system and open system.
2. Differentiate work and heat.
3. Differentiate isothermal and adiabatic process.
4. Describe the absolute scale of temperature.
5. State the second law of thermodynamics and explain it.
6. A gas occupies 0.35cubic meter at a pressure of 1kg/sqcm. Find the work done on the gas, if it is compressed isothermally to a pressure of16kg/ sqcm.
7. What is a reversible thermodynamic process?
8. Explain the concept of entropy. Deduce the expression for the entropy for a monatomic gas.
9. Show that the change in entropy of a substance in a cyclic process is zero.
10. Write the uses of compressed air.
11. Explain what do you mean by degree of freedom.
12. What do you mean by study flow system.

III. Answer ANY SIX   [6x5=30]

1. Deduce from the kinetic theory of gases, an expression for the pressure of a gas. Also prove that $PV = RT$

2. Write the importance of steam table and represent the various properties.

3. Hundred liters of air at 1.0kg/sqcm absolute and 30°C is heated at constant pressure until its temperature is 100°C and then it is compressed to 40 liters according to the law $PV1.2$ = constant. Find the change in entropy of each stage and of the system. R=29.3 and Cp =0.24.

3. Explain the working of a multi stage air compressor.

5. Explain the working of an Otto cycle and deduce the formula for its efficiency.

6. Derive the expression for work done during the adiabatic process.

7. What is a compressor and deduce its efficiency.

8. 4. 1.0 kg of steam initially dry saturated at 11.0kg/ sq. cm expands in a cylinder following the law $PV1.13$ = constant. The pressure at the end of the expansion is 1.0kg/ sq cm. Determine a) final volume b) final dryness fraction c)work done   d)the change in internal energy.

iv. Answer ANY ONE only.   [1x10=10]

1. Derive the expression for the efficiency of Duel cycle .

2. Derive an expression for the efficiency of a Carnot's engine in terms of temperature of source and sink

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