KERALA AGRICULTURAL UNIVERSITY
B.Tech. (Food Engg.) 2012 & previous Admission
Re- examination – June 2019

Meen.1203 **Engineering Thermodynamics (2+1)**

Marks: 80
Time: 3 hours

I **Fill in the blanks** **(10x1=10)**

1 The extensive property of a system is one whose value depends on ----------
2 An open system is one in which both---------- and ----------cross the boundaries of the system.
3 Work done in a free expansion process is ----------
4 The heat content of a system is called ----------
5 Heat and work are ----------function.

State True or False

6 Carnot cycle consist of two isothermals and two isentropics.
7 Kelvin plank's law deals with conversion of heat into work.

Define

8 Closed system.
9 Zeroth law of Thermodynamics.
10 Enthalpy.

II **Write Short notes on ANY TEN of the following** **(10x3=30)**

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

III **Answer ANY SIX of the following** **(6x5=30)**

1 Derive the expression for work done during the adiabatic process.
2 Deduce from the kinetic theory of gases, an expression for the pressure of a gas. Also prove tha PV = RT
3 Explain the working of an Otto cycle and deduce the formula for its efficiency.
4 Write the importance of steam table and represent the various properties.
5 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.
6 What is a compressor and explain different types of it.

P.T.O

7 Write the importance of steam table and represent the various properties

8 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 ofthe expansion is 1.0kg/ sq cm. Determine

(a) final volume

(b) Final dryness fraction

© Work done

(d) The change in internal energy

IV **Answer ANY ONE of the following** **(1x10=10)**

1 Derive the expression for the efficiency of Diesel engine.

2 Calculate the work done in a Carnot cycle. Deduce the efficiency of carnot engine in terms of temperatures between it works

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