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3rd Sem / Mechanical Engg.

Subject : Thermodynamics - I

Time : 3 Hrs. M.M. : 60

SECTION-A

Note: Multiple choice questions. All questions are compulsory (6x1=6)

Q.1 Zeroth law of thermodynamics is based on which property (CO1)

a) Temperature b) Pressure

c) Density d) Velocity

Q.2 The work transfer (PdV) is zero for which of the following processes? (CO2)

a) Constant pressure process

b) Constant volume process

c) Adiabatic process

d) None of the above

Q.3 Sum of internal energy with the product of pressure and volume is called as (CO1)

a) Entropy b) Enthalpy

c) Internal energy d) None of the above

Q.4 The refrigerator and heat pump is work on which principle. (CO1)

a) First law of thermodynamics

b) Second law of thermodynamics

c) Third law of thermodynamics

d) Zeroth law of thermodynamics

Q.5 PV = mRT, is applicable for which of the following gas. (CO2)

a) Real gas

b) Ideal gas

c) Both real and ideal gas

d) None of the above

Q.6 The value of triple point of water is (CO4)

a) 0k b) 13.84k

c) 273.16k d) 298k

SECTION-B

Note: Objective/ Completion type questions. All questions are compulsory. (6x1=6)

Q.7 The properties which do not depend on the_____ of the system are called intensive properties (CO1)

Q.8 During constant temperature process change in internal energy is zero. (True/False) (CO2)

Q.9 Give one example of positive displacement compressor. (CO6)

Q.10 The function of_____ is to increase the temperature of air before it enters the furnace of steam generator. (CO6)

Q.11 Define Swept Volume. (CO4)

Q.12 Define wet steam. (CO4)

SECTION-C

Note: Short answer type questions. Attempt any eight questions out of ten questions. (8x4=32)

Q.13 Explain the quasi-static process. (CO1)

Q.14 Write the similarity between Heat and work. (CO4)

Q.15 Derive the equation PV=mRT (CO2)

Q.16 Explain Mollier (T-S) Diagram. (CO4)

Q.17 What are boiler mountings. Briefly explain any two mountings. (CO3)

Q.18 Compare water tube and fire tube Boiler. (CO3)

Q.19 What are the uses of compressed Air. (CO6)

Q.20 Compare Reciprocating compressor and Rotary air compressor. (CO6)

Q.21 Explain the process of steam formation from ice. (CO4)

Q.22 Derive the expression for heat addition during isobaric process (CO1)

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x8=16)

Q.23 Derive the expression (COP) heat pump = (COP) refrigeration + 1 (CO1)

Q.24 Give detailed classification of the Boiler on various parameters. (CO3)

Q.25 The values of C_p and C_v for an ideal gas are 0.984 KJ/kg-k and 0.728 KJ/Kg-K respectively. Find the value of characteristics gas constant (R) and specific heat ratio (γ). If one kg of gas is heated at constant pressure from 25^0C to 200^0C if its initial volume is $2m^3$. Then find heat added, work done, and change in internal energy. (CO2)