4th Sem / Branch : MECH. ENGG.
Subject:- THERMODYNAMICS-I

Time : 3Hrs.   M.M. : 100

SECTION-A

Note: Multiple choice questions. All questions are compulsory   (10x1=10)

Q.1   Bomb Calorimeter is an example of   (CO-1)
a)   Closed system
b)   Isolated system
c)   Open system
d)   Homogeneous system

Q.2   The value of characteristics gas constant (R) for atmospheric air is   (CO-2)
a)   287 J/Kg K   b)   0.287 J/ Kg K
c)   2.87 J/Kg K   d)   28.7 J/Kg K

Q.3   Constant pressure process is also known as   (CO-3)
a)   Isochoric process   b)   Isobaric process
c)   Isothermal process   d)   Throttling process

Q.4   First law of thermodynamics deals with   (CO-4)
a)   Conservation of energy
b)   Conservation of force
c)   Conservation of mass
d)   Conservation of momentum

Q.5   Kelvin planck's statement deals with   (CO-4)
a)   Conservation of heat
b)   Conservation of momentum
c)   Conservation of mass
d)   Conservation of heat into work

Q.6   The point at which all the three phases-solid, liquid and vapour co-exist in equilibrium is called (CO-5)
a)   Critical Point
b)   Point of Contraflexure
c)   Triple point
d)   Ideal point

Q.7   Mollier diagram is a plot of   (CO-6)
a)   Temperature and entropy
b)   Temperature and enthalpy
c)   Entropy and pressure
d)   Enthalpy and entropy

Q.8   Which of the following is a boiler mounting (CO-7)
a)   Pressure gauge   b)   Economiser
c)   Superheater   d)   Air preheater

Q.9   Otto cycle is also known as   (CO-8)
a)   Constant pressure cycle
b)   Constant volume cycle
c)   Constant entropy cycle
d)   Constant temperature cycle

Q.10 For same compression ratio, the efficiency of otto cycle is _____ Diesel cycle   (CO-8)
a)   Greater than   b)   Less than
c)   Equal to   d)   None of the above

SECTION-B

Note: Objective type questions. All questions are compulsory.

(10x1=10)

Q.11 In a closed system, there is no transfer of _____ across the system boundary . (CO-1)

Q.12 Name any two intrinsic properties. (CO-1)

Q.13 In the Throttling process Workdone=_____. (CO_3)

Q.14 A machine which violates the first law thermodynamics is called _____ . (CO-4)

Q.15 Define Entropy (CO-6)

Q.16 For dry steam, dryness fraction=_____ (CO-6)

Q.17 Give any two examples of fire tube boilers. (CO-7)

Q.18 A thermodynamic cycle using air as the working sustance is known as _____ (CO-8)

Q.19 Write the function of intercooler. (CO-9)

Q.20 The gas which obeys the law Pv=RT at all temperature and pressure is known as _____ (CO-5)

SECTION-C

Note: Short answer type questions. Attempt any twelve questions out of fifteen questions. (12x5=60)

Q.21 Define thermodynamic property. what are its different types. Explain ? (CO-1)

Q.22 Find the mass of a gas occupying $5.5m^3$ at 7 bar absolute pressure and 200^0c. Take gas constant R=287 J/Kg K. (CO-2)

Q.23 Explain Throttling process (CO-3)

Q.24 Explain any two applications of general steady flow equation (CO-4)

Q.25 Explain Vanderwall's Equation of state (CO-5)

Q.26 If the dryness fraction of a given sample of steam is 0.85, find the mass of water particles contained in 2Kg of this steam (CO-6)

Q.27 Write any five difference between Fire tube and water Tube boilers (CO-7)

Q.28 Find the compression ratio of an otto cycle , if the efficiency of otto cycle is 55% and Υ=1.5 (CO-8)

Q.29 Write any five difference between Reciprocating and Rotary air compressor (CO-9)

Q.30 Define specific heat Give the relation between C_p and C_v (CO-2)

Q.31 A carnot engine working between 620 K and 300 K gives 200 KJ of work. Calculate the thermal efficiency of engine and heat added during the process (CO-4)

Q.32 Explain P-V-T surface of an Ideal gas (CO-5)

Q.33 Explain the working of seprating calorimeter (CO-6)

Q.34 What are the objectives of Boiler accessories. Name any four boiler accesories (CO-7)

Q.35 Draw P-V and T-S diagrams of a Diesel cycle (CO-8)

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x10=20)

Q.36 Explain the construction and working of Babcock Wilcox Boiler with a neat sketch (CO-7)

Q.37 Explain the construction and working of single state Reciprocating Compressor with a neat sketch (CO-9)

Q.38 Explain Kelvin-Planck's and Clausius staements. (CO-4)