Roll no._____ **ID: 180332**

Semester: 3rd

Branch: Auto

Subject Name: Basics of Thermodynamics, Hydraulics & Pneumatics

Time Allowed : 3 Hrs. **MM:100**

Section –A

Note: Multiple Choice questions. All questions are compulsory. (CO1) 10x1=10

Q1 For a perfect gas, according to Boyle's law (where P = Absolute pressure, V = Volume and T = Absolute temperature)
(A) V/T = constant, if p is kept constant (B) P v = constant, if T is kept constant
(C) T/P = constant, if v is kept constant (D) P/T = constant, if v is kept constant

Q2 Otto cycle is also known as
(A) Constant pressure cycle (B) Constant volume cycle
(C) Constant temperature cycle (D) Constant temperature and pressure cycle

Q3 The heat and mechanical energies are mutually convertible. This statement was established by
(A) Boyle (B) Charles (C) Joule (D) None of these

Q4 Heat and work are
(A) Point functions (B) System properties
(C) Path functions (D) Intensive properties

Q5 Hydraulics is the study of_____.
(A) Compressible fluids (B) Incompressible fluids
(c) Ideal fluids (d) Gaseous fluids

Q6 Which fluid is used in hydraulic power systems?
(A) Water (B) Oil (C) Both A&B (D) None

Q7 Which part of the Pneumatic system stores the compressed air?
(A) Air dryer (B) Air compressor (C) Air receiver tank (D) Air lubricator

Q8 Which element is responsible for controlling hydraulic pressure in hydraulic system?
(A) Control valve (B) Heat exchanger (C) compressor (D) All of the above

Q9 What is called heart of hydraulic system
(A) Reservoir (B) Heat exchanger (C) Control valve (D) Pump

Q10 Which system possesses the lowest weight to power ratio?
(A) Hydraulic (B) Pneumatic (C) Mechanical (D) Electrical

Section-B

Note: Objective type questions. All questions are compulsory. (CO1) 10x1=10

Q11 Pneumatics is the technology deals with the _____.

Q12 Example of Applications of hydraulic systems is _____.

Q13 Petroleum based oils are non-flammable in nature. (True/False)

Q14 Lobe pump is a high pressure pump. (True/False)

Q15 _____ is used to convert the power of pressurized air into mechanical energy.

Q16 _____is the form of energy that is transferred between system and surrounding due to temperature difference.

Q17 _____is point function.

Q18 The property depend on the mass of the system is called_____.

Q19 Tea thermos is an example of _____ system.

Q20 A system in which energy can crosses the boundary of the system but the mass cannot is known as _____

Section –C

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

Q21 Differentiate between heat and work? (CO2)

Q22 Compare open, close and isolated system? (CO2)

Q23 Explain second law of thermodynamics? (CO2)

Q24 Write a short note on otto cycle? (CO2)

Q25 What do you understand by thermodynamic properties? Explain its types? (CO3)

Q26 $4m^3$ of a gas at 8 bar abs, pressure expands to a volume of $16m^3$ at constant temperature. Find the final pressure of the gas? (CO4)

Q27 How the various components work in the hydraulic system, show with line diagram? (CO3)

Q28 What is the function of carburetor and how it works? (CO3)

Q29 Explain briefly working of root blower with neat diagram? (CO3)

Q30 Explain any one application of Bernoulli theorem with diagram? (CO3)

Q31 Briefly explain the concept of Vander-wall's equation? (CO3)

Q32 A certain gas occupies $3m^3$, at a temperature of 130 °C. The pressure of the gas is 8 bar and the gas expands in such a manner that the volume becomes $6m^3$ and the temperature becomes 20 °C. What will be the pressure of gas after expansion? (CO4)

Q33 State and explain Boyle's and Charles law of thermodynamics? (CO2)

Q34 What do you understand by pressure, explain its types? (CO2)

Q35 Write any five properties of fluids? (CO1)

Section-D

Note: Long answer questions. Attempt any two questions out of three questions.

2x10=20

Q36 Explain construction and working of hydraulic brake with neat diagram? (CO3)

Q37 Explain construction and working of pneumatic screw driver with near diagram? (CO3)

Q38 The left leg of a U-tube mercury manometer is connected to a pipe line conveying water, the level of mercury in the leg being 60cm below the center of pipe line and right leg is open to atmosphere. The level of mercury in the right leg is 40cm above that in the left leg and the space above mercury in the right leg contains benzene having specific gravity 0.88 up to height of 24 cm. Determine the pressure in the pipe? (CO3)