491   Register No.: [   ]

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PART – A

1.   State first law of thermodynamics.

2.   What are intensive and extensive properties? Give examples for each.

3.   What are the assumptions made in deriving air standard efficiency?

4.   What are black body and white body?

5.   State the types of piston rings.

6.   List any three comparison of air cooling and water cooling systems.

7.   Define specific fuel consumption and friction power.

8.   Write down the stoichiometric air required for the complete combustion of 1 m^3 of fuel.

9.   Define C.O.P.

10.   Define dehumidification.

PART – B

11.   (a)   (i)   Derive the general gas equation and characteristic equation of gas. (8)

(ii)   Derive the relationship $C_p - C_v = R$.   (6)

(Or)

(b) 0.25 kg of air at a pressure of 1 bar occupies a volume of 0.3 m^3. If this air expands isothermally, to a volume of 0.9 m^3 determine. (i) The initial temperature (ii) The final temperature (iii) External work done (iv) Change in internal energy (v) Heat absorbed by the air (vi) Change in entropy. Assume R = 0.29 kJ/kg K.

12. (a) Derive an expression for air standard efficiency of Diesel cycle.

(Or)

(b) An Otto cycle consists of two isentropic and two constant volume processes. The compression ratio is 6. The pressure and temperature at the beginning of compression are 1 bar and 35^0 C respectively. The maximum pressure of the cycle is 30 bar. If air is working fluid, determine the heat added and work done per kg of air and the thermal efficiency of the cycle.

13. (a) Describe the working of two stroke cycle diesel engine with neat sketches.

(Or)

(b) Explain the working of magneto coil ignition system with a neat sketch.

14. (a) Explain any one method of finding calorific value of gaseous fuel.

(Or)

(b) The following data were recorded in four cylinder petrol engine total swept volume = 2000 cc, clearance volume = 60 cc per cylinder, maximum cycle temperature =1400^{0}C. At the beginning of compression, pressure is 10^5 N/m^2 and temperature is 24^{0}C. Calculate the air standard efficiency and mean effective pressure.

15. (a) Explain with a line diagram the construction and working of vapor absorption refrigeration system.

(Or)

(b) Explain central air conditioning system with neat sketch.

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185/25—2