

Register No.:

380

April 2024

Time – Three hours
(Maximum Marks: 100)

- [N.B. 1. Answer all questions under Part-A. Each question carries 3 marks.
2. Answer all the questions either (A) or (B) in Part-B. Each question carries 14 marks.]

PART – A

1. Define Intensive and Extensive Property. Give some examples.
2. Compare Isothermal and Isentropic Process.
3. Define compression Ratio and cut off Ratio.
4. Write short notes on Flue Gas.
5. Define Dryness and Wetness Fraction.
6. List the advantages of Condenser in steam Power Plant.
7. What is meant by Specific Fuel Consumption?
8. Mention any three differences between SI and CI engine.
9. State any three properties of Refrigerants.
10. What is Air Conditioning?

PART – B

11. (a) A gas whose pressure, volume and temperature are 5 Bar, 0.23m^3 and 185°C respectively has changed its state at constant pressure until its temperature becomes 70°C . Determine (a) Work done, (b) Change in internal energy, (c) The heat transferred during the process. Take $R=0.290\text{ kJ/kgK}$ and $C_p= 1.005\text{ kJ/kg K}$.
(Or)
(b) Derive an expression for the Heat transfer, Change in internal energy, Change in Entropy and work done during adiabatic process.

[Turn over.....

12. (a) An air standard Diesel cycle has a compression ratio of 18 and the heat transferred to the working fluid per cycle is 1800KJ/Kg. At the beginning of compression stroke, the pressure is 1bar and the temperature is 300K. Calculate the temperature at each point of the cycle. Take $C_p=1.005$ KJ/Kg K, $C_v=0.718$ KJ/Kg K and $R=0.287$ KJ/Kg K.

(Or)

- (b) Explain any one method of finding the calorific value of gaseous fuel with neat sketch.

13. (a) Steam at a pressure of 10 bar and 0.9 dry expands to the atmospheric pressure hyperbolically. Specific heat of steam is 2.1KJ/Kg K. Determine (a) Work done (b) Change in Internal Energy (c) Change in Enthalpy (d) Heat Absorbed.

(Or)

- (b) Explain the construction of Lamont boiler with neat sketch.

14. (a) The following data were obtained during a trial on an oil engine.
BP = 73.55KW, Fuel Consumption = 16.5 Kg/hr,
CV = 45200 KJ/kg, Mechanical Efficiency = 82%. Find the Brake Thermal Efficiency, Indicated Thermal Efficiency and Indicated Power.

(Or)

- (b) (i) Discuss about the Root Blower with neat sketch. (6)
(ii) Discuss about the Axial Flow Air compressor with neat sketch. (8)

15. (a) Explain about vapour compression refrigeration system.

(Or)

- (b) Explain the working of a Central Air Conditioning Plant with the help of a Line Diagram. State its Advantages, Disadvantages and Applications.
