22562

12425

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions : (1) All Questions are *compulsory.*

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(4) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

(5) Use of steam tables, logarithmic, Mollier's chart is permitted.

Marks

1. Attempt any FIVE of the following : **10**

(a) Define the term "Compressor Capacity".

(b) State the function of catalytic converter.

(c) Classify Air Conditioning System.

(d) State four objectives of super charging.

(e) Plot the psychometric chart and show sensible heating and latent heating on it.

(f) List the various methods to reduce the pollution in diesel engine.

(g) List diagnostic tools used in fault finding in two wheelers.

2. Attempt any THREE of the following : **12**

(a) Represent diesel cycle on PV & TS diagram.

(b) Give four classifications of Air compressor.

(c) Explain the working of storage type water cooler with sketch.

(d) Explain the objectives and advantages of turbo charging.

3. Attempt any THREE of the following : **12**

(a) Differentiate between two stroke and four stroke I.C. engine. (any four points)

(b) A two stroke cycle I.C. engine has a mean effective pressure of 5.8 bar. The speed of the engine is 940 rpm. If the diameter of piston and stroke are 120 mm and 130 mm respectively, find the indicated power developed and piston speed.

(c) Describe in brief working of axial flow compressor with sketch.

(d) Represent the Brayton cycle on PV & TS diagram.

4. Attempt any THREE of the following : **12**

(a) Explain the following terms used in Refrigeration :

(i) COP

(ii) One tonne of Refrigeration

(b) Explain with sketch the CRDI system used in diesel engine controlled by ECU.

(c) Explain the working of single stage single acting reciprocating Air compressor with sketch.

(d) "Octane number is measure of knock resistance". Justify the statement.

5. Attempt any TWO of the following : **12**

(a) A simple saturation vapour compression cycle using R-12 is designed for 10 TR capacity. The vapours are dry saturated at the start of compression. For 268 °K evaporative temperature and 308 °K condenser temperature, represent process on PH diagram.

Find :

(i) Mass flow rate of the refrigerant

(ii) Power required in kW

(iii) COP if the enthalpy values are

(1) $H_1 = 185$ kJ/kg

(2) $H_2 = 206$ kJ/kg

(3) $H_3 = 70$ kJ/kg

(b) List the methods to improve thermal efficiency of gas turbine and explain any one of them.

(c) Explain any six desirable properties of Refrigerant.

6. Attempt any TWO of the following : **12**

(a) Compare reciprocating and rotary compressor. (any six points)

(b) Explain the working of "Turbo Jet" with neat sketch.

(c) The following data is collected during a trial of four cylinder petrol engine :

B.P. with all cylinder working = 15.8 kW

B.P. with cylinder No. 1 cutoff = 11.14 kW

B.P. with cylinder No. 2 cutoff = 11.2 kW

B.P. with cylinder No. 3 cutoff = 11.36 kW

B.P. with cylinder No. 4 cutoff = 11.3 kW

Find mechanical efficiency of engine.
