11718

3 Hours / 100 Marks Seat No. | | | | | | | | |

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

(2) Answer each next main Question on a new page.

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

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Use of Non-programmable Electronic Pocket Calculator is permissible.

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

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

Marks

1. (A) Attempt any SIX : **12**

(a) What is hard water & soft water ?

(b) Name two units used for measuring hardness of water.

(c) Define C.O.P. of refrigeration cycle.

(d) Name any two Boiler mountings.

(e) Define Enthalpy of dry saturated steam.

(f) Give any two advantages of thermic fluid over steam.

(g) Define dry bulb and wet bulb temperature.

(B) Attempt any TWO : **8**

(a) Give any four points of comparison between zeolite process and lime soda process of water treatment.

(b) Give the selection criteria of ideal refrigerator.

(c) Compare between Fire-tube and Water-tube boiler.

2. Attempt any FOUR : **16**

(a) Explain Hot lime Soda process for water treatment.

(b) What is dry ice ? State & define the unit of refrigeration.

(c) Name any two boiler accessories and draw neat labelled sketch of any one.

(d) Draw a neat sketch of induced draft cooling tower with neat label.

(e) Explain humidification and dehumidification.

(f) Give any one method each of removal of temporary and permanent hardness of water with suitable reaction.

3. Attempt any FOUR : **16**

(a) What is Eco-friendly refrigerant ? Give one example and advantage of it.

(b) Draw neat sketch of water level indicator for boiler. State its function & importance.

(c) Why & what type of air is required for instrumentation purpose ?

(d) Explain method of obtaining instrument Air.

(e) Write in short of psychrometric chart.

(f) Draw neat labelled diagram of any one water-tube boiler.

4. Attempt any FOUR : **16**

(a) Name various water softening process. Describe zeolite, water treatment method.

(b) What are primary & secondary refrigerants ? Give two examples of each.

(c) Draw a sketch of economiser & state its importance.

(d) State any eight industrial uses of Air.

(e) With neat sketch explain thermic fluid heater.

(f) Find COP for refrigerator which is working on reverse Carnot cycle between the temperature of 30°C to – 10°C with capacity of 10 tones.

5. Attempt any FOUR : **16**

(a) Draw labelled sketch of vapour compression refrigeration cycle.

(b) What is boiler act ? Explain the duties of boiler inspector.

(c) Draw sketch of fluidized bed boiler and state its specific application.

(d) What is caustic embrittlement, priming and foaming in boiler ?

(e) Explain construction and working of sling psychrometer.

(f) Describe the process of desalination.

P.T.O.

6. Attempt any TWO : **16**

(a) Explain with neat figure vapour absorption system in refrigeration cycle.

(b) What is Membrane Technology ? Describe reverse osmosis process & its application.

(c) Find the enthalpy, entropy of 1 kg of steam at a pressure of 10 bar.

(i) When steam is dry and saturated.

(ii) When steam is 75% dry.

(Use steam table for reference)