

17425

16172

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) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (6) Use of steam tables, psychrometric chart is permitted.

Marks

1. (A) Attempt any SIX :

2 × 6 = 12

- (a) Define hard water and soft water.
- (b) What do you mean by scale and sludge in boiler ?
- (c) Define – Ton of Refrigeration.
- (d) What is the function of steam trap ?
- (e) List out at least four elements involved in humidity chart.
- (f) Why interstage coolers are required in multistage compression system ?
- (g) What is the basic difference between boiler and thermic fluid heater ?

(B) Answer any TWO :

2 × 4 = 8

- (a) Define –
 - (i) Dry Bulb Temperature
 - (ii) Wet Bulb Temperature
 - (iii) Relative Humidity
 - (iv) Absolute Humidity

[1 of 4]

P.T.O.

- (b) Draw neat and proportionate sketch of Natural Draft cooling tower with labelling.
- (c) What is Reverse Osmosis ? Describe it.

2. Answer any FOUR :**4 × 4 = 16**

- (a) How boilers are classified ? (any four)
- (b) Draw the neat sketch of any one water-tube boiler.
- (c) What is Instrument air, compressed air and process air ?
- (d) List out different types of thermic fluid with their temperature ranges (any four).
- (e) Draw the flow sheet of getting instrument air.
- (f) Differentiate between Humidification and Dehumidification.

3. Answer any FOUR :**4 × 4 = 16**

- (a) Explain the ion exchange process for softening of water.
- (b) Give classification of Refrigerants with example.
- (c) What is Economizer ? Draw a neat sketch of it.
- (d) Explain Boiler Act w.r.t.
 - (i) Certificate of Renewal
 - (ii) Boiler Accident
- (e) A refrigerator is working on Reverse Carnot Cycle between temperatures of 35 °C – 20 °C with capacity of 10 tonnes. Find COP.
- (f) What is the function of pressure gauge ? Explain its working.

4. Answer any FOUR :**4 × 4 = 16**

- (a) What are the different sources of water ?
- (b) What is boiler corrosion caused by dissolved oxygen ? Write the reaction.
- (c) Why Ammonia is commonly used in Industry ? Give its properties and application. (2 each)
- (d) What do you mean by eco-friendly refrigerant ? Give example.
- (e) What is sensible heat and latent heat ?
- (f) Draw a neat sketch of steam trap (any one type).

5. Answer any FOUR :**4 × 4 = 16**

- (a) Explain water level indicator with principle, construction and its working.
- (b) How to prepare boiler for inspection ?
- (c) List the properties and applications of Monochlorodifluoro methane (R-22).
(2 each)
- (d) Define :
 - (i) Foaming
 - (ii) Coefficient of performance
 - (iii) Priming
 - (iv) Demineralization
- (e) Explain any one type of Refrigeration cycle with neat sketch.
- (f) Explain with neat sketch – fluidized bed boiler.

P.T.O.

6. Answer any TWO :

8 × 2 = 16

- (a) Explain Vapour Absorption Refrigeration system with neat diagram.
 - (b) Calculate the specific enthalpy and specific entropy of 1 kg of steam at 15 °C, when dryness factor is 0.80.
 - (c) Atmospheric air at 760 mm of Hg barometric pressure has 25 °C DBT & 15 °C WBT. With the help of psychrometric chart, determine
 - (i) Relative humidity
 - (ii) Dew point temperature
-