

17425

14115

3 Hours / 100 Marks

Seat No.

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- Instructions :** (1) All Questions are *compulsory*.
(2) Illustrate your answers with neat sketches wherever necessary.
(3) Figures to the right indicate full marks.
(4) Assume suitable data, if necessary.
(5) Use of Non-Programmable Electronic Pocket Calculator is permissible.
(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.
(7) Use of steam tables, logarithmic, Mollier's chart is permitted.

Marks

1. (A) Attempt any SIX :

12

- Which salts causes the temporary and permanent hardness in water ?
- Name four important refrigerants used in industries.
- Define :
 - Relative humidity
 - Dew point temperature
- Define wet bulb temperature and dry bulb temperature.
- What is R-22 ? Give its properties.
- Give reason for scaling in boiler.

(B) Attempt any TWO :

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- Which are the reactions that take place with hard water in lime soda process (any four).
- With neat sketch explain the working of fluidized bed boiler.
- Draw the neat labelled diagram of Babcock and Wilcox boiler.



P.T.O.

2. Attempt any FOUR :**16**

- (a) Differentiate between water tube boiler and fire tube boiler.
- (b) What is the use of resins in the Ion-exchange method of softening of water ? Describe it.
- (c) How boilers are classified ? (any four classification)
- (d) Describe working of Economizer.
- (e) How psychometry chart is constructed ?
- (f) Define :
 - (i) Coefficient of performance (op.)
 - (ii) Ton of refrigeration

3. Attempt any FOUR :**16**

- (a) What is reverse osmosis ? Where it is used ? Describe it.
- (b) What should be the qualities of water for its industrial use ? Give different uses of water in industry.
- (c) Describe the temperature ranges of any four different thermic fluids with their uses.
- (d) How the boiler is prepared for inspection ? Give the steps.
- (e) Draw neat diagram of sling psychrometry.
- (f) What is caustic embrittlement ? Give two methods to prevent it.

4. Attempt any FOUR :**16**

- (a) A barometer reads 750 mm of Hg. The dry bulb temperature is 33 °C and wet bulb temperature is 23 °C. Determine
 - (i) Relative humidity
 - (ii) Dew point temperature
- (b) What are the desirable properties of ideal refrigerant ?
- (c) Give the types of cooling tower. Describe any one type with diagram.
- (d) Give the advantages of thermic fluid over steam.
- (e) With the help of a diagram, explain the working of water level indicator.
- (f) Explain boiler act with respect to :
 - (i) Boiler repair
 - (ii) Boiler registration

5. Attempt any FOUR :**16**

- (a) What is Refrigeration ? Give the schematic diagram with labels of vapour compression cycle.
- (b) Describe the process for converting moist air into instrument air.
- (c) What are boiler mountings ? Name any two boiler mountings and give their uses.
- (d) Explain Zeolite process for water treatment.
- (e) Draw a neat labelled diagram of Cochran boiler.
- (f) What are the industrial uses of air ?

6. Attempt any TWO :**16**

- (a) Describe the working of waste heat recovery boiler.
 - (b) Explain vapour absorption cycle.
 - (c) Find the enthalpy, entropy of 1kg of steam at a pressure of 10 bar.
 - (i) When steam is dry and saturated
 - (ii) When steam is 75% dry using steam tables.
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