

17425

15116

3 Hours / 100 Marks

Seat No.

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- Instructions* –
- (1) All Questions are *Compulsory*.
 - (2) Answer each next main Question on 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 of the following:** **12**
- (i) Give any two uses of water in
 - 1) domestic purpose
 - 2) industrial purpose
 - (ii) Which salts cause temporary hardness? How is it removed?
 - (iii) Define ton of refrigeration.
 - (iv) Define:
 - 1) Sensible heat
 - 2) latent heat

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- (v) How boilers are classified based on the position of furnace? Give one example of each.
- (vi) What are the industrial uses of air? (any four)
- (vii) Give the uses of thermic fluid. (any two)
- b) **Attempt any TWO of the following:** **8**
- (i) Draw a neat labelled diagram of ion exchange process.
- (ii) How refrigerants are classified? Give two examples of refrigerants.
- (iii) What is the use of steam trap? Explain its working.
2. **Attempt any FOUR of the following:** **16**
- a) What is priming and foaming? How these can be prevented?
- b) What are the properties of ideal refrigerants?
- c) Write down the procedure for preparing boiler for inspection.
- d) Explain natural circulation cooling tower.
- e) Explain the process to get instrument air.
- f) Explain reverse osmosis in detail.
3. **Attempt any FOUR of the following:** **16**
- a) What is R - 22? Give its uses and properties.
- b) With a diagram explain the working of economisers.
- c) What is the use of psychrometric chart? How is it used?
- d) Draw a neat diagram of forced draft cooling tower and describe its working.
- e) What are the advantages of multistage compression?
- f) Explain Boiler Act with respect to
- (i) duties of Chief Inspector
- (ii) transfer of boiler
- (iii) registration of boiler
- (iv) certificate of renewal

- 4. Attempt any FOUR of the following:** **16**
- a) Write down the reactions taking place with hard water in lime soda process.
 - b) What is brine? Give properties and uses of brine. (any two each)
 - c) Explain construction and working of pressure gauge in boiler.
 - d) Explain construction and working of sling psychrometer.
 - e) Explain construction and working of thermic fluid heater.
 - f) A refrigerator is working on reversed carnot cycle between 25°C to -15°C with capacity 10 tons. Find COP.
- 5. Attempt any FOUR of the following:** **16**
- a) Explain the principle used in air refrigeration.
 - b) Explain:
 - (i) enthalpy of dry saturated steam
 - (ii) enthalpy of superheated steam
 - c) What are boiler mountings and accessories? Name any two boiler mountings and boiler accessories and state their uses.
 - d) Define:
 - (i) absolute humidity
 - (ii) relative humidity
 - e) Calculate the specific enthalpy of 1 kg steam at 10°C when its dryness fraction is 0.8.
 - f) Differentiate between hard water and soft water.
- 6. Attempt any TWO of the following:** **16**
- a) With a neat labelled diagram explain zeolite process for water treatment.
 - b) Explain absorption refrigeration in detail.
 - c) With a neat labelled diagram explain the construction and working of water level indicator.
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