17425

21819

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 Steam tables, logarithmic, Mollier's chart is permitted.

Marks

1. a) **Attempt any SIX of the following :** **12**

(i) List any two uses of water in industry.

(ii) Differentiate between hard water and soft water (any two points)

(iii) Define ton of refrigeration.

(iv) Define dry steam and wet steam.

(v) Give the function of steam trap.

(vi) Give any two uses of compressed air.

(vii) Give the names of two thermic fluids with their temperature range.

b) **Attempt any TWO of the following :** **8**

(i) Write the reactions taking place between hardness producing salts and lime soda in lime – soda process (four reactions)

(ii) A refrigerator system operates between 35° C and 15° C determine COP.

(iii) Compare water tube boilers and fire tube boilers (four points).

Marks

2. Attempt any FOUR of the following : **16**

a) Explain desalination of water by reverse Osmosis.

b) Explain any four properties of ideal refrigerant.

c) Give the classification of boilers.

d) Explain the working of sling psychrometer with a neat sketch.

e) Explain the method to get instrument air with the help of a diagram.

f) List the methods to remove scales from boiler.

3. Attempt any FOUR of the following : **16**

a) What is R-22? Give its properties. What is eco friendly refrigerant. Give one eg.

b) With the help of a diagram, explain the working of water level indicator.

c) Draw the diagram of a forced draft cooling tower and mark the parts.

d) Define dry bulb temperature and relative humidity.

e) Explain the advantages of multistage compression.

f) With the help of a diagram, explain the working of air preheater.

4. Attempt any FOUR of the following : **16**

a) What is caustic embrittlement. List the methods to prevent it.

b) Give the classification of refrigerants.

c) Explain the construction and working of fluidized bed boiler.

d) Explain how humidity chart is constructed.

e) List the advantages of thermic fluid over steam (four points)

f) What are secondary refrigerants. Give two examples.

Marks

5. Attempt any FOUR of the following : **16**

a) Explain vapour absorption refrigeration.

b) Find the enthalpy and entropy of 5 kg of steam at 15 bar.

c) Give the function of pressure reducing valve and economizer.

d) Explain the parts of a cooling tower.

e) Explain the working of pressure gauge with the help of a diagram.

f) Explain the methods to prevent boiler corrosion due to dissolved oxygen.

6. Attempt any TWO of the following : **16**

a) Explain the ion exchange process carried out for the treatment of hard water. List the reaction involved. How the cation and anion exchanger beds are regenerated.

b) Explain vapour compression refrigeration with a neat sketch.

c) Explain boiler act with respect to

(i) Registration of boiler.

(ii) Boiler accidents.

(iii) Duties of chief inspector.

(iv) Certificate of renewal
