17425

21314

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

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.

Marks

1. a) **Attempt any <u>SIX</u> of the following:** **12**

i) Define hard water and soft water.

ii) Define:

1) Sensible heat

2) Latent heat

iii) Give reason for scaling in boiler.

iv) Give any four factors for boiler selection.

v) Give the names of different refrigeration system.

vi) Give the different uses of compressed air in a process industry. (any two)

vii) What is dryness fraction ? Write formula.

Marks

b) **Attempt any TWO of the following:** **08**

i) Give classification of boiler according to various factors.

ii) Explain the carnot refrigeration cycle.

iii) What is zeolite process ? Give advantages of zeolite process ? (any two)

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

a) What is selection criteria for refrigerant.

b) Draw the neat labelled diagram of simple vertical boiler.

c) Explain method of obtaining instrument air in industry.

d) What is thermic fluid heater ? Explain with neat sketch.

e) Draw and explain working of economizer.

f) A refrigerator is working on reversed carnot cycle between the temperature of 28°C to –5°C with capacity of 10 tones find C.O.P.

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

a) How refrigerants are classified.

b) What are boiler mounting ? Name any two boiler mountings and give their uses.

c) Explain priming and foaming.

d) Explain with neat sketch construction and working of fluidised bed boiler.

e) Explain what is IBR and Non IBR Boiler.

f) What is reverse osmosis ? Describe it.

Marks

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

a) What are the different impurities in water?

b) Draw and Explain sling psychrometer.

c) Give the properties and uses of Dowtherm A.

d) Give the advantages of multistage compression.

e) Define:

i) Dry-bulb temperature.

ii) Relative humidity.

f) $200m^3$ of air per minute at 15°C DBT and 75% R.H. is heated until it's temperature is 25°C find:

i) Wet bulb temperature of heated air.

ii) R.H. of heated air.

iii) Heat added to air per minute.

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

a) What is caustic embrittlement ? Give two methods to prevent it.

b) Draw neat sketch of Bucket steam trap.

c) Give any four duties of Boiler Inspector.

d) How psychrometric chart is constructed ?

e) Explain vapour absorption refrigeration system.

f) Compare between fire tube and water tube boilers.

Marks

6. Attempt any <u>TWO</u> of the following: **16**

a) Explain Vapour Compression refrigeration cycle.

b) Explain forced draft cooling tower with neat sketch. Give the classification of cooling tower.

c) Name the various water softening process. Explain ion exchange process with neat sketch.

17425

21314
3 Hours / 100 Marks