22311

11819

3 Hours / 70 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.

(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. Attempt any FIVE of the following: **10**

a) Name the salts which causes the temporary and permanent hardness in water.

b) Define enthalpy of saturated steam.

c) Give the uses of compressed air (any four)

d) Define ton of refrigeration.

e) Give any four properties of ''R-22''.

f) Define wet bulb and dry bulb temperature.

g) Define:

(i) absolute humidity

(ii) relative humidity

Marks

2. Attempt any THREE of the following: **12**

a) Give the reactions that take place with hard water in Hot lime soda process. (any four)

b) Sketch and explain the working of water level indicator.

c) Explain the process of getting compressed air using flow sheet.

d) Explain the working of induced draft cooling tower with neat sketch.

3. Attempt any THREE of the following: **12**

a) Explain the following and give methods to prevent it.

(i) Priming and foaming

(ii) Caustic embrittlement

b) Explain zeolite method for water treatment with neat sketch.

c) Sketch and explain the working of thermic fluid heater.

d) Explain duties of inspector for Boiler. (any four)

4. Attempt any THREE of the following: **12**

a) Explain ion exchange process for hard water treatment.

b) Draw a neat labelled diagram of Bab Cock and Wilcox boiles. State its advantages.

c) Give the use of the following:

(i) Steam trap

(ii) Economizer

(iii) Pressure reducing valve

(iv) Preheater

d) Explain the working of air compressor

e) Distinguish between compressed air, process air and instrumental air. Give the advantages of multistage compression (any two)

Marks

5. Attempt any TWO of the following: **12**

a) Explain vapour absorption refrigeration cycle.

b) Give the classification of refrigerants. List the selection criteria for refrigerants. (any four)

c) 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

6. Attempt any TWO of the following: **12**

a) Define coefficient of performance (COP). A refrigeration system is operated between 40°C and – 15°C. The capacity of machine is 10 tonnes. Calculate COP.

b) Explain construction and working of hot lime soda process with neat sketch.

c) Explain Indian Boiler Act regarding following points:

(i) Boiler registration

(ii) Renewal of certificate

(iii) Transfer of Boiler

(iv) Penalty

(v) Boiler repair and maintenance