

Scheme G
Sample Test Paper-I

Course Name : Diploma in Chemical Engineering

Course Code : CH

Semester : Fourth

Subject Title : Plant Utility

Marks : 25

17425

Time :1 hour

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. Preferably, write the answers in sequential order

Q.1 Attempt any THREE

9 Marks

- a. What are the impurities present in water?
- b. Which salts causes the temporary & permanent hardness in water?
- c. What is unit of refrigeration? Define it.
- d. Name four important refrigerants used in industries.

Q.2 Attempt any TWO

8 Marks

- a. What is reverse osmosis? Describe it.
- b. Compare zeolite & lime soda process.
- c. A refrigeration system is operating between 25°C and 10°C . Find out actual COP if it is 60% of maximum.

Q.3 Attempt any TWO

8 Marks

- a. What is the selection criterion for refrigerants?
- b. Draw neat sketch of lithium bromide vapour absorption system explain it.
- c. What is scale and sludge formation in boiler? How its treatment is done?

Scheme G
Sample Test Paper-II

Course Name : Diploma in Chemical Engineering

Course Code : CH

Semester : Fourth

Subject Title : Plant Utility

Marks : 25

17425

Time :1 hour

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. Preferably, write the answers in sequential order

Q1. Attempt any THREE

9 Marks

- 1) How boilers are classified? Give two example of each.
- 2) What are different mountings & accessories used for safety operation of boiler?
- 3) What are industrial uses of air?
- 4) Define : - i) Specific humidity ii) Relative humidity iii) Due point temperature

Q2. Attempt any TWO

8 Marks

- 1) Draw & explain psychometric chart of humidity measurement.
- 2) What is thermic fluid heater? Explain it.
- 3) Explain with neat sketch construction & working of fluidised bed boiler.

Q3. Attempt any TWO

8 Marks

- 1) Explain formation of steam at constant pressure.
- 2) What are different types of thermic fluids are used other than steam gives their temperature ranges.
- 3) Explain boiler act with respect to following points
 - i) Certificate of renewal ii) Boiler accidents iii) Boiler repair.

Scheme G
Sample Question Paper

Course Name : Diploma in Chemical Engineering

Course Code : CH

Semester : Fourth

Subject Title : Plant Utility

Marks : 100

17425

Time : 3 hour

Instructions:

1. All questions are compulsory
2. Illustrate your answers with neat sketches wherever necessary
3. Figures to the right indicate full marks
4. Preferably, write the answers in sequential order
5. Use of steam table is permissible.

Q.1 A Attempt any SIX

12 Marks

- a) How hard water and soft water can be identified?
- b) How hardness of water can be measured?
- c) Define Coefficient of performance of refrigeration cycle?
- d) Give reason for scaling in boiler
- e) What is dryness fraction? Write its formula.
- f) Define 1) Specific humidity 2) Relative humidity
- g) Give the names of thermal fluid used for heating and cooling of process fluids.

Q.1 B Attempt any TWO.

08 Marks

- a) Which are the reactions take place with hard water in lime soda process?
- b) What are the properties of ideal refrigerants?
- c) Compare between fire tube and water tube boilers

Q.2 Attempt any FOUR

16 Marks

- a) What is zeolite process? Give advantages of zeolite process
- b) What are the properties of refrigerant considered for selection of refrigerants?

- c) What are boiler mountings? Name any two boiler mountings and give their uses.
- d) State types of cooling tower define range
- e) Explain humidification and dehumidification.
- f) What components causes permanent hardness and temporary hardness?

Q.3 Attempt any FOUR

16 Marks

- a) What do you mean by CFC free refrigerants? Give an example and advantage of CFC refrigerants.
- b) 48 kg of steam has one kg of water in the suspended form. What will be the condition of this steam?
- c) Why dried and low pressure air is required for instrumentation air?
- d) Explain method of obtaining instrument air in industry.
- e) How psychrometric chart is constructed?
- f) Draw the neat labeled diagram of Babcock Wilcox boiler.

Q.4 Attempt any FOUR

16 Marks

- a) What are the various water softening processes? Describe Ion exchange process.
- b) How refrigerants are classified? Give two examples of each type.
- c) Describe working of economizer.
- d) What are the industrial uses of air.
- e) What is thermic fluid heater? Explain with neat sketch.
- f) A refrigerator is working on reverse Carnot cycle between the temperature of 30°C to -10°C with capacity of 10 tones , find COP.

Q.5 Attempt any Four

16 Marks

- a) Describe vapour absorption refrigeration cycle.
- b) Explain boiler act with respect to following points.
 1. Certificate of renewal
 2. Boiler accident
 3. duties of inspectors
 4. Registration of boiler

- c) With neat sketch explain the working of fluidized bed boiler.
- d) Define wet bulb temperature and dry bulb temperature. At what condition both the temperatures are equal?
- e) What is caustic embrittlement? Give two methods to prevent it.
- f) Describe the process of desalination.

Q.6 Attempt any TWO

16 Marks

- a) Describe reverse osmosis process? Where it is used?
- b) Explain vapour compression refrigeration cycle.
- c) Find the enthalpy of two kg of steam at a pressure of 14 bar when steam is 75% dry.

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