Q.30 Explain the reverse osmosis treatment of brackish water in brief.

Q.31 Differentiate between acid refractories and basic refractories.

Q.32 Describe the working of natural draft cooling tower.

Q.33 Discuss the different factors responsible for boiler corrosion along with the remedial measures to be adopted.

Q.34 Explain selection of refrigerants in brief.

Q.35 Explain in brief software, hard water and distilled water.

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x10=20)

Q.36 Discuss the construction and working of Babcock Wilcox boiler in detail with help of neat diagram.

Q.37 Explain in detail temporary and permanent hardness. Also why it is necessary to soften water for steam generation?

Q.38 Write short note on any two of the following.

a) Classification of refrigerants
b) Economizer and preheater
c) Electrodialysis
d) Zeolite process of water softening.

No. of Printed Pages : 4 180561/120561/030561
Roll No. .....

6th Sem / Chem, P & P, Chem Engg. (Spl. Paint Tech.)
Subject:- Process Plant Utilities / Proc. Utilities

Time : 3Hrs. M.M. : 100

SECTION-A

Note: Multiple choice questions. All questions are compulsory (10x1=10)

Q.1 What is molecular formula of lime?

a) $CaCO_3$ b) $AI(OH)_3$
c) $Ca(OH)_2$ d) $Mg(OH)_2$

Q.2 Water is used in boiler for generation of

a) Steam b) Power
c) Electricity d) Current

Q.3 Temporary hardness in water may be removed by

a) Decomposition b) Boiling
c) Freezing d) None of these

Q.4 Unit of enthalpy of evaporation is

a) Joule/m b) Joule/Sec
c) Kg/KJ d) KJ/Kg

Q.5 Which of the following is internal treatment process of water softening?

a) Phosphate conditioning
b) Zeolite process
c) Lime soda process
d) Ion-Exchange process

Q.6 Which of the following is not a water boiler problem?

a) Priming b) Coning
c) Foaming d) Scaling

Q.7 Which of the following is fire tube boiler?

a) Cochran b) Lancshire
c) Locomotive d) All of these

Q.8 Mollier chart is

a) Enthalpy-temperature diagram
b) Enthalpy-Entropy diagram
c) Entropy-temperature diagram
d) Internal energy temperature diagram

Q.9 Which of the following not a unit of hardness?

a) PPM b) Degree Clarke
c) Degree French d) Degree centigrade

Q.10 Which of the following is low temperature insulation?

a) Rigid foam
b) Multiple layer powder
c) Both a & b
d) None of these

SECTION-B

Note: Objective type questions. All questions are compulsory. (10x1=10)

Q.11 Define priming.
Q.12 Define quality of wet dream.
Q.13 Define latent heat of vaporization.
Q.14 Define insulation.

Q.15 Name a chemical added to the boiler feed water to prevent foaming in boiler.
Q.16 What is steam trap?
Q.17 What are acid refractories?
Q.18 Expand STPP.
Q.19 Write the name of two types of cooling towers.
Q.20 Write any two refrigerants used in chemical industry.

SECTION-C

Note: Short answer type questions. Attempt any twelve questions out of fifteen questions. (12x5=60)

Q.21 Explain the used of carbon / Graphic refractories and its application.
Q.22 Differentiate between scale and sludge formation.
Q.23 Explain the lon exchange process of water softening in brief.
Q.24 Explain in brief the function and working of steam ejectors.
Q.25 What is caustic embrittlement? How it can be avoided?
Q.26 Differentiate between colloidal conditioning and phosphate conditioning.
Q.27 Discuss the thermodynamic and physical properties of refrigerants in brief.
Q.28 Explain in brief wet steam, dry saturated steam and super-heated steam.
Q.29 Discuss the characteristics and properties of insulation.