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Sub: PUPS (BTCHC 605)

- 1) Attempt any four parts in the following:
 - (a) Differentiate between process utilities and process streams.
 - (b) Discuss various process utilities available for cooling of the process streams and their range of application.
 - (c) Discuss various sources of water availability in Process industries.
 - D) How demineralized water is produced on industrial scale?
 - E) What are the various steps to be taken to obtain boiler feed water?
 - f) Discuss important processing steps to be Undertaken for converting waste waters into drinking water.
- 2) Attempt any four of the following:
 - (a) What are the different parameters of safety in chemical industry?
 - (b) Describe the ways by which you can protect environment from toxic components of chemical industry.
 - (c) Write a short note on "Types of explosions possible in a chemical industry".
 - (d) Give safety aspects related to "noise" and "pressure".
 - (e) Describe the main steps to protect yourself from "Radiation" and "Temperature" in industry.
 - (f) Describe "Fire Triangle" and its different components.
- 3) Attempt any four of the following
 - (a) Give the safety limits of toxicity. (b) Describe the safety limits of flammability.
- 4) "Water is life line of food processing plant" Justify?
- 5) What is role of economizer and optimizer in the boiler?
- 6) Define boil corrosion. Explain the need and methods of treatment of boiler feed water.
- 6) Explain the process and biochemical reactions involved in chlorination of water.

- 7) What are the different utilities of the food plant?
- 8) What is draught? Discuss its usefulness in boiler operation?
- 9) List different boiler accessories and auxiliaries? Discuss their role?
- 10) Explain the activated sludge process with neat sketch.
- 11) Write a note on humidity chart.
- 12) What are the sources of water?
- 13) What is a steam jet ejector?
- 14) What do you mean by efficiency of a steam turbine?
- 15) What is super-heated steam?
- 16) What are the major treatment steps for drinking water?
- 17) Define the terms used to characterize air-water systems.
- 18) How steam economy can be improved?
- 19) What is the function of a dehumidifier?
- 20) What are the different types of air conditioning equipment's commonly used?
- 21) What treatment is required for high pressure boiler feed water?
- 22) Write a brief note on heat transfer media.
- 23) What is spray pond cooling?
- 24) Explain briefly about primary and secondary plant utilities.

- 26) What factors must be taken into account while designing distribution lines for water in a chemical plant?
- 25) What is meant by hardness of water? How hardness can be removed?
- 26) Explain with a sketch, the compressor setup used for compressing synthesis gas for ammonia manufacture.
- 27) Describe the working of (i) steam jet ejector (ii) an axial compressor.
- 28) How does a vacuum pump differ from a compressor? Briefly explain the methods employed to produce very high vacuum.
- 29) Discuss briefly about the types of packing materials and mechanical seals used in compressor equipment's.
- 30) Explain the different types of condensers used in refrigeration system.
- 31) Explain briefly the important methods used for low temperature gas liquefaction.
- 32) Discuss the standard vapor compression refrigeration cycle in detail with the aid of a sketch. How can the Mollier diagram can be made use of in the design of a refrigeration system.
- 33) Why do humidification and dehumidification become necessary in air water systems? Bring out the difference between the two. Briefly describe the equipment's for these operations.
- 34) Discuss how the need arises for the cooling of water in process plants. Name the equipment's usually used for the cooling of water and describe the salient features of each.
- 35) What are the different types of air conditioning equipment's commonly used in industrial plants? Describe the important features of these.
- 36) What are the factors that affect the efficiency of steam generation?
- 37) Discuss about steam handling and its effective distribution.
- 38) What is the various water softening methods available?
- 39) How hardness of water can be expressed?

- 58) What is relative humidity?
- 59) Distinguish between fans and blowers
- 60) Explain specific volume of steam
- 61) How steam economy can be improved?
- 62) What are the different methods of producing refrigeration?
- 63) How does a vacuum pump differ from a compressor?
- 64) Explain the use of compressed air in process plants
- 65) What is a booster ejector?
- 66) What are the different types of steam turbines?
- 67) Define volumetric efficiency
- 68) What is a steam trap?
- 69) Distinguish between centrifugal and axial compressor
- 70) What is a barometric condenser?
- 71) Name the chemical generally employed for the removal of turbidity in water
- 72) Define the efficiency of steam turbine
- 73) How scaling in boiler tubes can be removed?
- 74) What are the major treatment steps to be used (i) drinking purposes (ii) for use in chemical process plants?
- 75) Explain the factors that must be taken into account while designing distribution lines for water in a chemical plant
- 76) (a) What special treatments are required for high pressure boiler feed water?
- 77) Explain the methods used for water conservation in big chemical industries
- 78) Describe the setup of a compressed air distribution system
- 79) Classify different types of vacuum pumps and explain their performance characteristics.
- 80) Discuss the merits and demerits of various compressors available
- 81) Explain the vapor-compression refrigeration diagram indicating the parts.
- 82) Name few industrial refrigerants and their desirable properties.
- 83) What are the various dissolved impurities present in water?

- 84) What is meant by permanent hardness of water?
- 85) Why intercooling is necessary in multistage compression?
- 86) How moisture is removed from compressed air?
- 87) What is cryogenic temperature?
- 88) What is psychrometric chart?
- 89) Differentiate between fans and blowers.
- 90) What are the various types of cooling towers?
- 91) Explain latent heat of evaporation.
- 92) How does a vacuum pump differ from a compressor?
- 93) What is an ejector?
- 94) Explain the function of the barometric condenser.
- 95) What are the common liquified gases?
- 96) What are the different types of air conditioning equipment's commonly used?
- 97) Classify steam turbines.
- 98) What are the chemicals used in the removal of turbidity of water?
- 99) Define percentage humidity.
- 100) Classify the different types of vacuum pumps.
- 101)List the components of a compressed air system.
- 102)List the factors affecting cooling tower performance?
- 103)What is meant by "Range and Approach" of a cooling tower?
- 104)What are different sources of water
- 105)What do you understand by 'water tube boilers' and 'fire tube boilers'?
- 106)Why boiler blow-down is required?
- 107)Why boiler blow-down is required?
- 108)What do you mean by IBR steam boiler.
- 109)What are the parameters required to estimate the boiler efficiency by 'direct method'?
- 110)Name the characteristics of steam which makes it most popular and useful to industries?
- 111)What is water hammer in a steam system?
- 112)What are the important guidelines for proper drainage and layout of steam lines?
- 113)What are different important refrigerants, Explain in details.
- 114)What are different method of refrigeration.
- 115)What is selection criteria for refrigerants.
- 116)Explain how Electrical safety is maintained in chemical Process plants.
- 117)Explain Chemical toxicity with classification and examples.
- 118)What are Chlorine Hazards
- 119)what are safety considerations in Ammonia storage.
- 120)What are Hazards in Plastic processing.
- 1- Classify fire with Examples.?
 - 2- How is foam used in firefighting?
 - 3- What is the different type of portable Fire Extinguishers?
 - 4- What are the points in Safety checklist during Start-up of Chemical plant?

