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**B.Tech.****(SEM. VII) THEORY EXAMINATION 2015-16  
PROCESS UTILITIES & SAFETY IN CHEMICAL PLANTS****Time: 3 Hours****Total Marks: 100****Note:** - Attempt **all** questions.

1. Attempt any **FOUR** parts of the following: (5x4=20)
  - (a) Describe the important process utilities in chemical industry.
  - (b) Explain in detail conservation and reuse of water.
  - (c) Discuss the surface sources of water with their important characteristics.
  - (d) Discuss the water resources management strategies in India.
  - (e) Differentiate between Water tube boiler and Fire tube boiler.
  - (f) Discuss the advantages and disadvantages of water sources.
2. Attempt any **FOUR** parts of the followings: (5x4=20)
  - (a) What is a steam trap? Discuss different types of steam traps.
  - (b) Explain in detail about utilization of steam in chemical plants.
  - (c) Discuss the various equipments used for steam generation.
  - (d) Define 'Super Heaters'. Also explain the operation of a steam condenser.
  - (e) What do you understand by 'steam economy'? Give any practical application in a chemical process plant.
  - (f) What do you mean by selection and sizing of boiler? Also discuss about flash tank.
3. Attempt any **TWO** parts of the followings: (10x2=20)
  - (a) Give the various methods for developing vacuum in process plants and also explain the limitation for each one of them.
  - (b) What are the desired properties of good insulating materials? How thermal insulators are classified? Discuss the importance of insulation.
  - (c) Discuss the operation of following:
    - (i) Reciprocating compressor
    - (ii) Steam jet ejector
4. Attempt any **TWO** parts of the following: - (10x2=20)
  - (a) Explain, in detail, Water Treatment Process.
  - (b) Discuss various methods for the extinction of fire. Differentiate between Hazard and Risk. What is HAZOP?
  - (c) How to select a site for a plant set-up? Also discuss about the plant safety
5. Attempt any **TWO** parts of the following: - (10x2=20)
  - (a) Discuss in detail about the disaster management. Also discuss Risk Management Routines.
  - (b) Discuss various legislations on safety control presently applicable in process chemical plants.
  - (c) Write short notes on the (i) Tackling Disaster and (ii) Pressure relief valve