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B. TECH.**THEORY EXAMINATION (SEM–VIII) 2016-17****PROCESS UTILITIES AND SAFETY IN CHEMICAL PLANTS***Time : 3 Hours**Max. Marks : 100**Note : Be precise in your answer. In case of numerical problem assume data wherever not provided.***SECTION – A**

1. **Attempt all parts of the following questions:** **10 x 2 = 20**
- (a) Underflow river water.
 - (b) Safety.
 - (c) Steam boiler.
 - (d) Process Steam.
 - (e) Exhaust Steam.
 - (f) Compressors.
 - (g) Air Filters.
 - (h) Cryogenic insulation.
 - (i) Disaster.
 - (j) Hazard.

SECTION – B

2. **Attempt any five parts of the following questions:** **5 x 10 = 50**
- (a) What do you mean by selection and sizing of boiler? Also discuss about flash tank.
 - (b) Explain in detail about the various sources of water and their characteristics.
 - (c) Explain in detail Water treatment process.
 - (d) Discuss various process utilities available for cooling of the process streams and their range of application.
 - (e) Discuss in detail for the distribution of water in a chemical process industry.
 - (f) Discuss different types of steam traps with neat diagram.
 - (g) Define super heater. Also explain the operation of steam condenser.
 - (h) How are flammable and toxic chemical stored? What precaution is taken while handling of three chemical?

SECTION – C

- Attempt any two parts of the following questions:** **2 x 15 = 30**
3. Discuss in detail about the disaster management. Also discuss Risk management routines and good operating practices and management.
4. Discuss the various methods available for the analysis of loss prevention in chemical engineering.
5. Write short notes on the following:
- (i) Reaction hazard index.
 - (ii) Interlocks, alarms, trips.
 - (iii) Plant layout.
 - (iv) Role of computer in safety.