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Total No. of Pages : 02

(Sem. - 7, 8)

Total No. of Questions : 09 B.Tech. (CHE) (2011 Onwards E-III) PLANT UTILITIES Subject Code : BTCH-823 Paper ID : [A2981]

# Time : 3 Hrs.

Max. Marks: 60

## INSTRUCTIONS TO CANDIDATES :

- 1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- 2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- 3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

### **SECTION-A**

- Q1 Answer briefly :
  - a) What is the significance of plant utilities in the chemical plant?
  - b) How steam boilers are classified according to Water Circulation Arrangement?
  - c) How steam boilers are classified according to use?
  - d) Enumerate the functions of regulating vales in boilers.
  - e) Differentiate between CI and SI engines.
  - f) How does inter-cooling reduce work input in multi-stage compression?
  - g) Enumerate various liquefaction processes used in chemical plants.
  - h) Enumerate various types of losses in axial flow compressors.
  - i) Why waste disposal is a major problem for chemical plants?
  - j) How soft water is obtained in chemical plants?



## **SECTION-B**

- Q2 Explain the construction and working of Water tube boilers giving a neat sketch.
- Q3 Explain the functions of following major components of boiler system: Feed water Heaters, Fuel Heater, Deaerators, Pumps, Combustion Air Blowers, Flue, Economizer, Steam Traps and Piping.
- Q4 Explain the working of two stroke diesel engine giving appropriate examples.
- Q5 Explain the mechanical details of single stage and two stage reciprocating compressors.
- Q6 Describe the working of forced draft cooling towers with the help of a neat sketch.

#### **SECTION-C**

- Q7 Describe the components of vapour compression refrigeration system and derive the expression for COP of vapour compression refrigeration system.
- Q8 a) Describe the construction and working carburetor giving a sketch.
  - b) Discuss the functions of various types of impeller blade shapes used in centrifugal compressors.
- Q9 a) Explain the construction and working of various components of chemical plant sewage system.
  - b) Describe various boiler mountings and accessories giving their functions.