

**(Following Paper ID and Roll No. to be filled in your Answer Books)****PAPER ID :****Roll No.**

--	--	--	--	--	--	--	--	--	--

**B.TECH.****Theory Examination (Semester-IV) 2015-16****PRINCIPLES OF CHEMICAL ENGINEERING****Time : 3 Hours****Max. Marks : 100**

Note: Attempt ALL questions. All question carry equal marks.

1. Attempt any two part of the following:
  - (a) Describe the importance of flow sheet diagram for material balance calculation along with its basic steps.
  - (b) Describe internal energy, enthalpy, surface energies and endothermic and exothermic process term used in energy transfer. Explain the mechanism of fluid flow.
  - (c) Discuss the transformation of glucose in an organism with suitable examples and equations.
2. Attempt any two of the following:
  - (a) Describe condensation along with its classification in detail.
  - (c) What are the various types of pumps used in chemical industries? Explain centrifugal pumps with neat sketch. Also discuss its advantage over other.
  - (d) Discuss various types of flow meters and their working principles.
3. Attempt any two of the following:
  - (a) What are the different types of evaporators? Describe long-tube vertical-type evaporator with diagram.
  - (b) What is drying? Explain working of tunnel dryer along with its advantage and disadvantage.
  - (c) What do you understand by distillation? List and describe various distillation method used in chemical industries.
4. Attempt any two of the following:
  - (a) Define gas absorption with illustration and working of gas absorption equipment.
  - (b) Discuss theory of gas absorption in detail.
  - (c) Define and classify the extraction in detail.
5. Attempt any two of the following:
  - (a) Explain the theory of crystallization with suitable illustration.
  - (b) Define and explain various types of filtration. List the factors affecting filtration.
  - (c) Describe crystal forms and rate of growth of crystals".