Code No: NR10803 **NR**

I B.Tech Supplementary Examinations, November/December 2005
INTRODUCTION TO CHEMICAL ENGINEERING
(Chemical Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Define vapour pressure of solution and derive the Raoult's law.
   (b) Define the osmotic pressure and state how to express it for a solution of non electrolytes.
   (c) Define the following: [8+4+4]
      i. Elevation of boiling point.
      ii. Depression of freezing point.
2. (a) State the Newton's law of viscosity. Describe non Newtonian fluids with the help of a shear stress vs shear rate diagram.
   (b) What is fluid head? Describe various fluid head components contain in the total energy balance for steady flow. [8+8]
3. Distinguish between laminar and turbulent flow. Explain each flow in detail? [16]
4. Write about combined heat transfer by conduction-convection and radiation? [16]
5. (a) What is azeotropic distillation?
   (b) Explain briefly the characteristics of minimum and maximum boiling azeotropes.
   (c) Discuss the principles of simple batch distillation. [4+4+8]
6. (a) Write about selection of dispersed phase in liquid liquid extraction.
   (b) Describe rotating disc contactor and centrifugal extractor. [4+12]
7. (a) Write about single stage equilibrium extraction with an example.
   (b) Explain the construction and operation of mixer-settlers with neat diagrams. Mention their uses and advantages. [6+10]
8. (a) Distinguish between physical and chemical adsorption.
   (b) Define and explain the process of adsorption. [8+8]

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