CH 384: Fundamentals of Chemical Engineering

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Theory : 100 marks
Sessional : 50 marks
Time : 3 Hrs

Introduction to Chemical Engineering: Definition, Origins and Development of the Chemical Process Industry. The Present Day Chemical Industry. The systematic Analysis of Chemical processes. representation of a Chemical Process in terms of Flow sheet. Functions of a Chemical Engineer. Professional and General Aspects of Chemical Engineering. Brief description of important Chemical Industries in terms of Unit Operations and Unit Processes. Measuring Techniques, Devices and Control in Process Industries. Pollution and its Abatement.

Numerical Methods: Different types of graph papers, statistical analysis of data, curve fitting, sorting of data, interpolation, Numerical integration, numerical differentiation

STOICHIOMETRY: Introduction- Units and Dimensions - stochiometric principles, composition relations, density and specific gravity.

IDEAL GASES, REAL GASES AND VAPOR PRESSURE: Behaviors of Ideal gases -kinetic theory of gases - application of ideal gas law- gaseous mixtures - volume changes with change in composition. Vapor pressure- effect of Temperature on vapor pressure-vapor pressure plots-vapor pressure of immiscible liquids-solutions. Properties of real gases, Van-der waals equation, Redlich kwong soave equation, Peng Robinson equation, Compressibility charts, etc

HUMIDITY AND SOLUBILITY: Humidity - saturation - vaporization - condensation - wet and dry bulb thermometry Solubility and Crystallization-Dissolution -solubility of gases.

TEXTBOOKS:
1. O.A.Hougen, K. M. Watson and R. A. Ragatz,"Chemical Process Principles", Vol-I,CBS Publishers and Distributors, New Delhi, 1995.
2. D. Himmelblau, '"Basic Principles and Calculations in Chemical Engineering", 5th Edn.,Prentice Hall of India Ltd.,N.Delhi,1994.
3. K V Narayanan and B Lakshmikutty, Stoichiometry and Process Calculations, , PHI
4. B.I.Bhatt and S.M.Vora, "Stoichiometry", Tata McGraw Hill Publishers Ltd., New Delhi, 1996.
5. V.Venkataramani and N.Anantharaman,"Process Calculations",Prentice Hall of India Ltd.,N.Delhi,2003.
6. Pallb Ghosh , Numerical methods with Computer Programs in C++, , PHI