Exam.Code:0002
Sub. Code: 0183

2053

B.A./B.Sc. (General) Second Semester

Industrial Chemistry

Paper - B: Material and Energy Balance

Time allowed: 3 Hours | Max. Marks: 75

NOTE: *Attempt five questions in all, including Question No. IX (Unit-V) which is compulsory and selecting one question each from Unit I- IV.*

x-x-x

UNIT - I

I. a) An aqueous solution of sodium chloride is prepared by dissolving 58.5 g NaCl in 100g of water find (i) Molality (ii) Mole fractions.

b) Calculate the equivalent weights of (i) H_2SO_4 (ii) $Ca(OH)_2$ (iii) PO_4^{-3} (iv) NaOH (v) N^{-3}

c) What do you mean by steady state and unsteady state systems? Give examples. (3x5)

II. a) $N_2 + 3H_2 \rightarrow 2NH_3$

56g of Nitrogen reacts with 14 g of hydrogen to produce 60g ammonia

(i) What is the limiting reagent in this reaction?

(ii) What is the % yield of ammonia? (5+5)

b) Write a note on multicomponent systems in Chemical Industry? (5)

UNIT - II

III. Write a short note on:-

a) Explain the working of spray columns used in absorption.

b) Draw a well labeled diagramme of Bubble columns and discuss their working in absorption process. (7,8)

IV. a) Give examples of Azeotropes. How are they separated by distillation?

b) Differentiate between batch and continuous distillation. (7,8)

UNIT - III

V. a) List different types of Filter Media And Filter Aids. What is the need and importance of filtration in a chemical process?

b) Elaborate upon various factors that help you to select an appropriate solvent for extraction process. (9,6)

VI. a) Discuss the working of falling film evaporators and draw a well labeled diagramme?

b) What is the purpose of drying process in Chemical Industry? Explain the working of rotary dryer? (9,6)

P.T.O.

UNIT - IV

VII. a) Write a note on specifications for fuel oil.

b) Write a note on Shell and tube type heat exchangers. (7,8)

VIII. a) Write a note on specifications of Air for Industrial Use?

b) What is desalination? How it is done? (8,7)

UNIT - V

IX. Attempt the following:-

a) List disadvantages of using hard water.

b) Define mole fraction in a two component system.

c) Give an example of an azeotrope.

d) Differentiate between drying and evaporation.

e) Define calorific value.

f) Give an example of a multi component system.

g) What is standard heat of formation of chlorine gas?

h) Define heat capacity of pure gases.

i) Which dryer is used for drying of granular or crystalline non sticky material?

j) Convert one poise into SI units. (10x1½)

x-x-x