2054
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. I which is compulsory and selecting one question from each Unit.

x-x-x

I. (a) Define limiting Reactant with the help of examples.
   (b) Define Desalination.
   (c) What do you mean by net and gross calorific value of a fuel?
   (d) Define Filter Media with example.
   (e) What is unbound moisture content and free moisture content?

(5*3)

UNIT I

II. (a) Define the following terms with an example
   (i) Equivalent Weight
   (ii) Yield in a reaction
   (iii) Molarity
   (iv) Open and closed system.

   (b) What is the mole fraction of the solute in a 1.00 M aqueous solution?

(10+5)

III. Define Material Balance and give outline of procedure for material balance calculations. What are its applications?

(15)

UNIT II

IV. (a) Explain with relevant procedure the separation of an azeotropic mixture.
   (b) Explain the term Energy balance. What are its applications?

(7+8)

V. Write a short note on:
   (a) Batch and Continuous distillation
   (b) Spray Columns

(15)

UNIT III

VI. (a) Describe the construction and working of Wiped (agitated) film evaporators.
   (b) Describe the working of a Film Evaporator with the help of diagram.

(7+8)

VII. (a) Explain the construction and working of Drum Dryer with the help of neat sketch. (9)
   (b) What is extraction? How would you select a solvent for extraction?

(6)

UNIT-IV

VIII. What do you understand by heat exchangers? Draw a labelled sketch of shell and tube type heat exchanger and explain its construction and working also

(15)

IX. What are specifications of air for industrial uses? Discuss any method for the processing of air used in industry?

(15)

x-x-x