Exam.Code:0002
Sub. Code: 0183

2071

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

Industrial Chemistry

Paper - B: Material and Energy Balance

Time allowed: 3 Hours | Max. Marks: 75

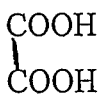
NOTE: *Attempt five questions in all, including Question No. IX (Unit-V) which is compulsory and selecting one question each from Unit I- IV.*

x-x-x

UNIT - I

I. a) Calculate equivalent weights and ionic/molecular weights of the following:-

i) CH_3COOH

ii) 

iii) H_3PO_4

iv) $Mg(OH)_2$

v) PO_4^{-3}

b) Explain the terms steady state and unsteady state systems with suitable examples. (10,5)

II. a) Explain the term material balance for batch and semi batch process.

b) Explain the terms open and closed systems with suitable examples. (10,5)

UNIT - II

III. Briefly discuss the following equipments:-

a) Mechanically agitated contractors

b) Bubble columns

c) Spray columns (3x5)

IV. a) How are azeotropes separated? Discuss the process.

b) Discuss the applications of plate columns and packed columns. (8,7)

UNIT - III

V. a) Write an introductory note on uses and applications of evaporators.

b) What is filtration? Write a note on different filter media. (8,7)

P.T.O.

VI. a) How will you select a solvent for extraction process?

b) Draw a well labelled diagramme of spray dryer and discuss its applications. (8,7)

UNIT - IV

VII. a) Give a brief account of different types of fuels and their respective sources.

b) What are the various specifications for use of water for industrial use? (8,7)

VIII. a) How is air processed for making it pollution free before releasing into the environment?

b) Write a short note on the working of shell and tube type heat exchangers. (8,7)

UNIT - V

IX. Attempt the following:-

a) What are non ideal solutions?

b) Which fuel causes highest pollution out of diesel, petrol and CNG?

c) Write the applications of centrifugation.

d) In a three component system what is the sum of mole fractions of an components.

e) Give two disadvantages of using hard water.

f) What are bubble columns used for?

g) Give names of different types of heat exchangers.

h) Define calorific value.

i) What do you mean by limiting reactant?

j) Calculate the weight of 0.2 moles of sucrose ($C_{12}H_{22}O_{11}$) (10x1½)

x-x-x