Exam.Code:0002
Sub. Code: 0183

2072

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	
1.	a. NaCl Weighing 600Kg is mixed with 200Kg KCl. Calculate the mole fraction of each component. Find the mole % composition for this mixture	5
	b. A Saturated solution of salicylic acid in methanol contains 64Kg Salicylic acid per 100Kg of methanol at 298K. Find the mass% and mole% composition of the solution	5
	c. Calculate the equivalent weights of i. SO_4^{-2} ii. $Ca(OH)_2$ iii. PO_4^{-3} iv. NaOH v. H_2SO_4	5
2.	a. Explain the concept of material Balance for batch and semi batch process citing complex citing examples.	5
	b. Consider the following equation $C + O_2 \longrightarrow CO_2$ 18g 32g 40g 18g of carbon reacts with 32 g of oxygen to produce 40g carbon dioxide i. What is the limiting reagent in this reaction. ii. What is the % yield of CO_2	5+5
	Unit II	
3.	Write a short note on a. Batch Distillation	7
	b. Mechanically Agitated Contractors	8
4.	a. Draw a well labelled diagramme of Plate Coulmns and explain its working.	7
	b. How are azeotropes distilled? Write an explanatory note.	8
	Unit III	
5.	a. Draw a well lablled diagramme of falling film evaporator and explain its functioning.	9
	b. Write a short note on different filter media.	6
6.	a. What are forced circulation evaporators explain their working?	9
	b. What are various types dryers used in drying process? Give uses of any three dryers.	6
	Unit IV	
7.	a. Write a note on specifications for fuel oil.	7
	b. Write a note on Shell and tube type heat exchangers	8

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8.	a. List various types of boilers. Give a detailed account of functioning of any one type of boiler. b. What is desalination? How it is done?	8 7
	UNIT - V	
9.	a. Define Chemical oxygen demand. b. What is the application of a flash dryer. c. Give an example of an azeotrope. d.Give an example of batch distillation process. e. Define calorific value. f. Define heat capacity of a pure gas at constant pressure g. What is standard heat of formation of Chlorine gas. h. Write two disadvantages of fuel combustion. i. Which dryer is used for drying of granular or crystalline non sticky material? j. List types of heat exchangers	1.5X10=15

x-x-x