$\mathbf{R05}$

I B.Tech Examinations, June 2011 INTRODUCTION TO CHEMICAL ENGINEERING **Chemical Engineering**

Time: 3 hours

Code No: R05010803

Max Marks: 80

[8+8]

[16]

Answer any FIVE Questions All Questions carry equal marks *****

- 1. (a) What is simple batch distillation? Explain with a neat diagram.
 - (b) Differentiate between distillation and absorption.

2. Give a detailed account of humidity and saturation.

- 3. (a) Describe the following terms in gas liquid operations:
 - i. Weeping
 - ii. Hydraulic gradient
 - iii. Hold up
 - iv. Axial mixing.

(b) Describe operation of packed column for gas liquid operations. [8+8]

- 4. (a) Write short notes on the following with suitable diagrams:
 - i. Flow arrangements in heat exchangers
 - ii. Variation of fluid temperatures in heat exchangers.
 - (b) Write a brief note on recuperators. [6+6+4]
- (a) Explain interphase mass transfer and mass transfer Coefficient. 5.
 - (b) Describe the overall mass transfer coefficient in terms of individual film coefficients. [8+8]
- 6. Write in detail about the following with neat diagrams:

- 7. (a) Explain the mechanical unit operations involved in chemical processes?
 - (b) Distinguish between unit operations and unit processes. [12+4]
- 8. (a) State the Newton's law of viscosity. Describe non Newtonian fluids with the help of a shear stress vs shear rate diagram.
 - (b) What is fluid head? Describe various fluid head components contain in the total energy balance for steady flow. [8+8]

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1.	(a)	Write short notes on the following with suitable diagrams:	
		i. Flow arrangements in heat exchangers	
		ii. Variation of fluid temperatures in heat exchangers.	
	(b)	Write a brief note on recuperators. $[6+6]$	3+4]
2.	Writ	e in detail about the following with neat diagrams:	
	(a)	Spray dryer	
	(b)	Drum dryer [8	3+8]
3.	(a)	What is simple batch distillation? Explain with a neat diagram.	
	(b)	Differentiate between distillation and absorption. [8	3+8]
4.	Give	e a detailed account of humidity and saturation.	[16]
5.	(a)	Explain the mechanical unit operations involved in chemical processes?	
	(b)	Distinguish between unit operations and unit processes. [12	2+4]
6.	(a)	Describe the following terms in gas liquid operations:	
		i. Weeping	
		ii. Hydraulic gradient	
		iii. Hold up	
		iv. Axial mixing.	
	(b)	Describe operation of packed column for gas liquid operations. [8	3+8]
7.	(a)	State the Newton's law of viscosity. Describe non Newtonian fluids with help of a shear stress vs shear rate diagram.	the
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8.	(a)	Explain interphase mass transfer and mass transfer Coefficient.	

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- i. Flow arrangements in heat exchangers
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- (b) Write a brief note on recuperators.
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4. Write in detail about the following with neat diagrams:

- (a) Spray dryer
- (b) Drum dryer [8+8]
- 5.(a) Explain interphase mass transfer and mass transfer Coefficient.
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