

ASSIGNMENT

SUB: Mass Transfer Operations-1

Sub Code: 18CH52

Note: Answer any 15 questions, choosing 3 from each module.

Module-1

1. Explain the classification of mass transfer operations based on phases in contact.
2. Define Molecular and Eddy Diffusion. State and explain Fick's law of Diffusion
3. Derive an expression for the molar flux for steady state gaseous diffusion of A through non diffusing/stagnant B.
4. Derive an expression for the molar flux for steady state equimolar counter diffusion of two gas phases.
5. Explain various theories of interphase mass transfer
6. Write a note on Stage, Cascade operation, NTU and HTU concepts

Module-2

7. Define the following: Absolute humidity, Relative & Percent humidity, Dew point, Wet Bulb Temperature, Dry Bulb Temperature, Humid Volume and Humid heat.
8. Write a note on Psychrometric Chart.
9. With a neat sketch, explain the construction and working of any one type of cooling tower.
10. Write a note on adiabatic saturation curve.

Module-3

11. Define the following: Equilibrium Moisture, Bound moisture, unbound moisture, free moisture and critical moisture content.
12. Draw and explain equilibrium moisture curve.
13. Draw typical rate of drying curve under constant drying conditions and explain various zones of drying.
14. Explain the construction and working of any two types of drying equipment.

Module-4

15. List various industrial adsorbents, their characteristics and applications with examples.

16. Explain the salient features of Physical adsorption and Chemisorption. Distinguish between them.
17. Explain the construction and working of any one type of adsorber.
18. Explain Freundlich isotherm.
19. Briefly explain the method of multistage adsorption.

Module-5

20. Define Saturation. Explain solubility curve.
21. What is Super saturation? Briefly explain the methods of super saturation and mechanism of crystal formation.
22. Write a note on Miers' Supersaturation theory.
23. With a neat sketch explain the working of any one type of crystallizer.
24. Write a short note on:
 - Ion Exchange Process
 - Reverse Osmosis
 - Microfiltration and Ultrafiltration
 - Dialysis
 - Super Critical Fluid Extraction