Question Bank for Mass Transfer - I

Chapter 1 FUNDAMENTALS OF MASS TRANSFER	
1.	**Explain the importance of mass transfer operations in chemical engineering.** *(L1 – Remember, CO1)*
2.	**State and explain the general principles of mass transfer operations with examples.** *(L2 – Understand, CO1)*
3	**Classify mass transfer operations and provide examples of each type.** *(L2 – Understand, CO1)*
4	**Differentiate between molecular diffusion and interphase diffusion.** *(L3 – Apply, CO1)*
5	**Describe diffusion in gases and liquids with suitable examples.** *(L2 – Understand, CO2)*
6.	**Derive Fick's law of diffusion and explain its significance in mass transfer.** *(L3 – Apply, CO1)*
Chapter 2 DISTILLATION	
1.	**Draw and explain different types of boiling point diagrams.** *(L1 – Remember, CO2)*
2.	**Define vapour-liquid equilibrium and explain its significance in distillation.** *(L2 – Understand, CO2)*
3.	**Derive the expression relating relative volatility (α) to mole fractions (x-y) in distillation.** *(L3 – Apply, CO4)*
4.	**Construct an equilibrium curve for a binary system from given data.** *(L4 – Analyze, CO5)*
5.	**Derive Rayleigh's equation for simple distillation and solve a basic problem using the equation.** *(L3 – Apply, CO3)*
6.	**Perform a material balance calculation for flash distillation.** *(L4 – Analyze, CO5)*
7.	**Analyze a fractionating column using McCabe-Thiele Method to determine feed plate location.** *(L4 – Analyze, CO4)*
8	**Explain the concept of minimum, optimum, and total reflux ratio with examples.** *(L2 – Understand, CO3)*
9	**Describe the construction and working of a rectification column.** *(L2 – Understand, CO4)*
10	**Identify the types of trays and reboilers used in distillation and explain their functions.** *(L3 – Apply, CO3)*
Chapter 3 ABSORPTION	
1.	**Explain the principles of absorption and list factors affecting the rate of absorption.** *(L1 – Remember, CO1)*
2.	**Describe the different types of equipment used for absorption.** *(L2 – Understand, CO3)*
3.	**Differentiate between regular and random packing materials used in absorption towers.** *(L3 – Apply, CO3)*

4.	**Define loading and flooding in packed columns and describe their effects on pressure drop.** *(L2 – Understand, CO4)*
5.	**Perform a calculation to determine the minimum gas-liquid ratio in an absorption system.** *(L4 – Analyze, CO5)*
Chapter 4 ADSORPTION	
1.	**Define adsorption and explain its types with examples.** *(L1 – Remember, CO1)*
2.	**List the factors affecting adsorption and explain their influence.** *(L2 – Understand, CO3)*
3.	**Describe different types of adsorbents and their properties.** *(L2 – Understand, CO3)*
4.	**Explain the concepts of elutriation and percolation with industrial applications.** *(L2 – Understand, CO6)*
5.	**Draw and explain the construction and working of industrial adsorption equipment.** *(L3 – Apply, CO4)*