QUESTION BANK FOR PHYSICAL CHEMISTRY

Chapter 1: Physical Properties of Liquids		**BTL**	**CO**
1	Describe the different types of intermolecular forces present in liquids and explain their impact on physical properties such as viscosity, surface tension, and boiling point.	Level 2: Understand, Level 4: Analyze	201.1
2	Discuss the effect of temperature on the vapour pressure of a liquid. How does the change in vapour pressure affect the boiling point of a liquid? Provide examples.	Level 4: Analyze, Level 3: Apply	201.1
3	Explain the Ostwald method for measuring viscosity and how temperature influences the viscosity of a liquid.	Level 2: Understand, Level 3: Apply	201.1
Chapter 2: Solutions		**BTL**	**CO**
1	Define the different types of solutions (solid in liquid, liquid in liquid, gas in liquid, etc.) and explain the characteristics of each type with examples.	Level 2: Understand, Level 4: Analyze	201.2
2	State Raoult's Law and explain how it applies to ideal solutions. How does it relate to the lowering of vapour pressure in a solution?	Level 2: Understand, Level 3: Apply	201.2
3	Discuss Henry's Law and solve a numerical problem based on the solubility of gases in liquids.	Level 2: Understand, Level 3: Apply, Level 4: Analyze	201.2
Chapter 3: Osmosis and Osmotic Pressure		**BTL**	**CO**
1	Explain the process of osmosis and describe the role of a semi-permeable membrane in osmotic pressure. Provide an example where osmosis is significant in biological systems.	Level 2: Understand, Level 3: Apply	201.3
2	Discuss the different theories of osmosis and explain how osmotic pressure is related to solute concentration.	Level 4: Analyze, Level 2: Understand	201.3
3	What is reverse osmosis, and how is it used in water purification? Describe the mechanism behind reverse osmosis and its real-world applications.	Level 2: Understand, Level 3: Apply	201.3
Chapter 4: Distribution Law		**BTL**	**CO**
1	State Nernst's Distribution Law and explain how it governs the distribution of a solute between two immiscible solvents.	Level 2: Understand, Level 3: Apply	201.2
2	Derive the expression for the equilibrium constant from the distribution coefficient. Solve a numerical problem based on this concept.	Level 3: Apply, Level 4: Analyze	201.2

3	Explain the concept of liquid-liquid chromatography and its applications in separating mixtures. How does the distribution law apply to this technique?	Level 2: Understand, Level 3: Apply	201.2
Chapter 5: Colloids		**BTL**	**CO**
1	Describe the different types of colloidal systems (aerosols, sols, emulsions, etc.). Provide examples of each and explain their characteristics.	Level 2: Understand, Level 4: Analyze	201.2
2	Discuss the methods of preparing sols and the various techniques used to purify them. How does the optical, kinetic, and electrical properties of sols differ from those of true solutions?	Level 2: Understand, Level 3: Apply	201.2
3	Define emulsions and gels. Discuss their types, properties, and applications in real-world scenarios.	Level 2: Understand, Level 3: Apply	201.2
Chapter 6: Adsorption		**BTL**	**CO**
1	Compare and contrast the processes of absorption and adsorption. Provide examples to explain the differences between them.	Level 4: Analyze, Level 5: Evaluate	201.4
2	Explain the different types of adsorption (physical adsorption and chemisorption) and how they differ in terms of the nature of interaction between the adsorbent and adsorbate.	Level 2: Understand, Level 4: Analyze	201.4
3	Describe the ion-exchange adsorption process and discuss its applications in water purification. Provide an example to demonstrate its effectiveness.	Level 2: Understand, Level 3: Apply	201.4