

**Part 1 Problems**

You must show all work using dimensional analysis when possible. Show all units throughout the problem. Show significant figures in your answers.

1. How many grams of sucrose (molar mass 342.22 g) would be needed to prepare 1505 ml of a 2.4 M solution? ( 8 points)

Answer: \_\_\_\_\_

2. What is the molarity of a solution made by dissolving 975 grams of  $C_{12}H_{22}O_{11}$  (342.22 grams/mole) in enough water to make 8,500.0 mL of solution? ( 7 points)

Answer: \_\_\_\_\_

3. What volume of a .500 M solution of NaCl (molar mass 58.45 g) would contain 35.21 g of the solute? ( 6 points)

Answer: \_\_\_\_\_

4. A solution is made by mixing 75.0 ml of 0.350 M BaCl<sub>2</sub> with 30.0 ml of 0.800 M LiCl. What is the molar concentration of the chloride ion in the new solution? ( 12 points)

Answer: \_\_\_\_\_

5. Water is added to 150.0 ml of 2.20 M KCl solution to decrease its concentration to .0500M? ( 10 points)
- a. What is the new volume (in liters)?

Answer: \_\_\_\_\_

- b. How much water (in liters) must be added?

Answer: \_\_\_\_\_

/22 points

6. A silver nitrate (molar mass = 169.88 g/mol) solution has a 35.2% (m/m) concentration.  
( 4 points)

a. How many grams of solute are in 134 g of solution?

Answer: \_\_\_\_\_

b. What is the molality of the solution? ( 7 points)

Answer: \_\_\_\_\_

7. What is the molarity of a 1.45 m sucrose (molar mass 342.22 g) solution that has a density of 1.10 g/ml? (16points)

Answer: \_\_\_\_\_

8. What would be the volume of a .800 M solution of  $C_{12}H_{22}O_{11}$ (342.22 g/mole) made with 505 g of solute? ( 6 points)

/22 points

Answer: \_\_\_\_\_

9. Classify the following bonds between the following elements as ionic, nonpolar covalent or polar covalent (4 points)

c. H and O \_\_\_\_\_

d. Ca and Br \_\_\_\_\_

10. Complete the following table (20 points) by :

- Writing in the second column the correct formula of the compound.
- Writing in the third column the symbol(s) or formula(s) of the most abundant species/particles present in the solution. Show all charges when necessary.
- Writing in the fifth column if the compound is a strong, weak, nonelectrolyte or N/A.

Name of Compound	Formula of Compound (a)	Solution Inventory (b)	Strong electrolyte weak electrolyte or nonelectrolyte (c)
Hydrogen iodide			
Barium hydroxide			
Hydrogen fluoride			
Lead (II) bromide			
Propyl alcohol	C <sub>3</sub> H <sub>7</sub> OH(aq)		
Ammonium sulfide			
Lithium carbonate			
Ammonia			
Lead (II) Nitrate			
Acetic acid			
Strontium sulfate			
Silver sulfate			
Nitric Acid			
Heptane (nonpolar)	C <sub>7</sub> H <sub>16</sub>		

/24 points