IC-Middle School **December 2004**
2 nd Intermediate_____ **Physical Science Test**

Name: _____

I. (16%) Circle the correct answer:

1- When you are shopping for juice, you see one can marked 20% fruit juice and another marked 70%. The 20% fruit juice is more _____ than the 70 % juice.

a. Dilute
b. Saturated
c. Concentrated
d. Unsaturated

2- You add sugar to 50 ml of hot tea and to 50 ml of iced tea until each is saturated. Which cup would have a higher concentration?

a. The iced tea
b. The hot tea
c. The concentrations of the hot tea and the iced tea are the same
d. Not enough information is given to answer the question

3- Solubility measures

a. The amount of solvent in a saturated solution.
b. The amount of solute needed to make a concentrated solution.
c. The temperature at which a solution becomes saturated.
d. The amount of solute needed to produce a saturated solution.

4- A saturated solution is best described as a solution

a. That contains a large amount of solute.
b. In which no more solute will dissolve.
c. That has water as the solvent.
d. With the largest amount of solvent.

5-Vinegar is a 5% solution of acetic acid in water. This would be considered a _____ solution.

a. Dilute
b. Concentrated
c. Colloid
d. Supersaturated.

6- Solution A contains 1 g of solute in 100 ml of water, and solution B contains 2 g of the same solute in 100 ml of alcohol. What can you say about the two solutions?

a. Both have the same concentration
b. Solution B is more concentrated than solution A.
c. Solution A is more concentrated than solution B.
d. It is unclear which solution is more concentrated.

7- To keep the gas in carbonated beverages after they have been opened, you should store them in a (n):

a. Cupboard
b. Refrigerator
c. Oven
d. Microwave

8- If you stir well some sugar in water, and some sugar settles in the bottom of the container, the solution is probably:

a. Dilute
b. Concentrated
c. Supersaturated
d. Saturated

II- (6%) Conversion of units:

350cm ⟶ m | **2.34L ⟶ ml**

Problem Solving

III- (16%) Two salt solutions are prepared. In the **solution A**, 0.2 kg of salt is dissolved in 500ml of water. In **solution B**, 56 g of salt are dissolved in 200ml of water. Which solution is more concentrated? Show your work.

IV- (14%) a) You are given a solution "A" containing 60 g of salt dissolved in 120 ml of water. Find the concentration of this solution.

b) You are asked to prepare 250 ml salty solution with the same concentration as "A". How much salt do you need? Show your work

V- Scientific method (24%)

Your friends were competing ***who can dissolve 20 grams of sugar in 100 ml of water faster***. They both started at 10:00 AM and stirred at the same rate. Fouad put 20 grams of sugar crystals in 100 ml of hot water; they dissolved completely at 10:02 AM. Karim put 20 grams of powdered sugar in 100 ml of cold water; they dissolved completely at 10:02 AM.

1. Who won the competition? How did you know?

_____

_____

2. What is (are) the variable(s) (changed factor) in this experiment?

_____

_____

3. Give 4 factors that were controlled in this experiment.

_____

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4. Can this competition be considered as a controlled experiment? Why?

_____

_____

5. Explain how stirring can increase the dissolving rate of sugar in water.

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VI- Critical thinking (6%)

Do you think a lake had the same concentration of dissolved minerals in hot, dry summer as in cold, rainy winter? Explain.

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VII- Data analysis (16%)

Sami tested the solubility of a solute X and solute Y. The data below was collected using 100g of water**.**

Temperature (º C)	**10**	**25**	**40**	**60**	**95**
Dissolved solute X(g)	**150**	**70**	**34**	**25**	**15**
Dissolved solute Y(g)	**20**	**29**	**34**	**54**	**69**

1. How many grams of solute X will dissolve in 100 g of water at 25º C?

_____

2. At what temperature would the same amounts of solute X and solute Y dissolve in 100 g of water?

_____

3. Which solute is more soluble in 100 g of water at 10 º C?

_____

4. What would happen if 100 g of water containing 54 g of Y at 60º C was quickly cooled to 40º C?

_____

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_____

5. Which of the above solute is more likely to be a gas, solute X or Solute Y? Justify your answer.

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Bonus: A large bottle of fabric softener states it contains enough softener to soften 100 loads of laundry. A different brand in a smaller bottle also states it contains enough to soften 100 loads of laundry. Explain how this can be?

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