Solutions Practice Test

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) Which of the following substances is NOT a solution?
   A) air
   B) brass
   C) copper
   D) All of the above are solutions.

2) Which of the following substances is NOT a solution?
   A) bronze
   B) sea water
   C) soda
   D) All of the above are solutions.

3) Suppose a Hydrochloric Acid solution contains 30 % HCl with the remaining portion of the solution composed of water.
   What is the solute in this type of solution?
   A) water
   B) air
   C) HCl
   D) NaCl
   E) none of the above

4) Oil does not dissolve in water because
   A) oil is polar.
   B) oil is nonpolar.
   C) water is nonpolar.
   D) water is saturated.
   E) oil is hydrated.

5) The solubility of solids in water:
   A) is independent of the temperature.
   B) increases with increasing temperature.
   C) decreases with increasing temperature.
   D) Solids are not soluble in water.

6) What is the molarity of a solution prepared by dissolving 10.7 g NaI in 0.250 L?
   A) 42.8 M
   B) 0.0714M
   C) 2.86×10^{-4} M
   D) 0.286 M
   E) none of the above

7) How many grams of KCI are needed to make 50.0 mL of 2.45 M KCI?

   A) 9.13
   B) 1.52
   C) 91.3
   D) 0.123
   E) none of the above

8) After you have completed the task of diluting a solution, which statement below must be TRUE?

   A) The new solution has more volume but has a lower concentration than before.
   B) The new solution has more volume but has a higher concentration than before.
   C) The new solution has less volume but has a lower concentration than before.
   D) The new solution has less volume but has a higher concentration than before.

9) What is the final concentration of a solution prepared by diluting 35.0 mL of 12.0 M HCI to a final volume of 1.20 L?

   A) 0.504 M
   B) 3.50 M
   C) 0.420 M
   D) 0.350 M

10) Which of the following statements about colligative properties is FALSE?

   A) The boiling point of a solution is increased by the addition of salt.
   B) The freezing point of a solution is lowered by the addition of salt.
   C) The change in temperature is proportional to the molality.
   D) The identity of the solute is not a factor.
   E) All of the above statements are true.

11) What is the molality of a solution made by dissolving 14.7 g of $C_6H_{12}O_6$ into 150.0 ml of water? Assume the density of water is 1.00 g/mL.

   A) 0.544
   B) 0.0816
   C) 10.2
   D) 0.980
   E) none of the above

12) What is the change in the boiling point of a solution made by dissolving 14.7 g of $C_6H_{12}O_6$ into 150.0 ml of water? The density of water is 1.00 g/mL and Kb = 0.512 °C/m.

    A) 0.502°C

    B) 5.22 °C

    C) 0.0418°C

    D) 0.279°C

    E) none of the above

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

13) A solution is a homogeneous mixture of two or more substances.

14) The major component in a solution is called the solute.

15) A saturated solution holds the maximum amount of solute under the solution conditions.

16) The solubility of solids in water generally increases with increasing temperature.

17) Molarity is defined as the moles of solute per liter of solution.

18) A sample of salt water will freeze at a higher temperature than a sample of pure water.