Practice Exam Water and Solutions

1. Water is
   A. polar molecule with polar covalent bonds between H and O
   B. non-polar molecule with polar covalent bonds between H and O
   C. polar molecule with non-polar bonds between H and O
   D. non-polar molecule with non-polar bonds between H and O

2. Iodine is a solid and bromine is a liquid at STP because of
   A. hydrogen bonding B. dipole interactions C. dispersion forces D. ions

3. It takes more energy to turn water into steam than ice into water because:
   A. hotter work requires more energy
   B. higher temperatures make Joules less efficient
   C. making steam requires breaking some hydrogen bonds
   D. making steam requires breaking all of the hydrogen bonds

4. Your 2.0 M $HCl_{(AQ)}$ solution of 400 mL contains how many grams of HCl?
   A. 0.8 g HCl B. 72 g HCl C. 28.8 g HCl D. 400 g HCl

5. How many grams of KCl are required to make 4.2 L of .25 M $KCl_{(AQ)}$?
   A. 77.7 g KCl B. 4.2 g KCl C. 0.25 g KCl D. 1.05 g KCl

6. How many grams of NaCl can dissolve into 50 mL of water at 90°C?
   A. 40 grams B. 20 grams C. 50 grams D. 90 grams

7. When $CaCl_2$ dissolves in water
   A. it is a covalent compound so it is NOT an electrolyte
   B. it is an ionic compound, so it is an electrolyte
   C. it is a covalent compound so it is an electrolyte
   D. it is an ionic compound so it is NOT an electrolyte

8. You have 1.2 L of 3.5 M $NaOH_{(AQ)}$. How many grams of NaOH are present?
   A. 3.5 grams B. 4.2 grams C. 40 grams D. 168 grams

9. Oil and vinegar do not mix. That's because
   A. they are miscible B. they are immiscible
   C. they are both polar covalent liquids D. neither is a non-polar solvent

10. A solution that contains more solute than theoretically possible is called:
    A. saturated B. unsaturated C. immiscible D. super-saturated

11. Why does CH_4 have a much lower boiling point (-164°C) than NH_3 (-33°C)?
    A. methane has many hydrogen bonds
    B. ammonia has many hydrogen bonds
    C. methane has a greater molecular mass than ammonia
    D. methane has more bonds to the central atom (4 vs. 3) than ammonia

12. Like dissolves like would account for:
    A. oil not dissolving in water
    B. HCl dissolving well in water
    C. LiCl dissolving well in water
    D. all three of the above

13. hahaha

14. When you add salt to water, the boiling point…
    A. increases, freezing point decreases
    B. decreases, freezing point decreases
    C. increases, freezing point increases
    D. decreases, freezing point increasesz

15. $CaCl_2$ is used rather than NaCl to melt ice because
    A. $CaCl_2$ ionizes into three moles of particles, NaCl into only 2 moles
    B. it's cheaper and cheaper is better
    C. it does not mess up rugs as much
    D. it tastes better after it runs off into our rivers in spring time

16. Hydrogen bonding will:
    A. cause a lower vapor pressure in water compared to rubbing alcohol
    B. cause a high boiling point in water compared to C_2H_6.(ethanol)
    C. cause surface tension to be great enough for bugs to stand on water
    D. all of the above

17. The amount of joules it will take to melt 60.0 grams of ice at zero centigrade to water at the same temperature is
    A. 60 joules B. 334 joules C. 20040 joules D. 135,600 joules

18. The energy required to heat 100.0 grams of water from 3°C to 17°C is
    A. 100 joules B. 3340 joules C. 1400 joules D. 5852 joules

19. In order to make 4250 mL of 1.7 M HCl from standard 12.0 M stock HCl, you need how many mL of stock solution?
    A. 4250 mL B. 1700 mL C. 602 mL D. 12.0 mL

20. Water freezes at STP at
    A. 373K B. 100°C C. 275K D. cannot be determined from the information given

21. If you measure there are 0.03 grams of mercury per kilogram of swordfish meat, what is the PPM of Hg in this meat?
    A. 0.00003 PPM B. 0.3 PPM C. 3.0 PPM D. 30.0 PPM

22. What is the reason that ice floats on water?
    A. hydrogen bonds force water into a six sided shape with space in the center
    B. van der Waal's forces
    C. ice (solid water) has a greater density than liquid water
    D. ice has a higher kinetic energy than liquid water

23. When you dissolve ammonium nitrate into water
    A. the compound dissociates and the reaction is exothermic
    B. the compound dissociates and the reaction is endothermic
    C. the compound does not dissolve & the reaction is thermochemically neutral
    D. the compound does not dissolve but the reaction is extremely exothermic

24. 522.0 grams of water has...
    A. 29 moles and a mass of one kilogram
    B. 29 moles and a boiling point of 273K
    C. 29 moles and a mass of 522.0 grams
    D. a boiling point of 100°C and a molarity of 1.0

25. If you find that 80.0 mL of diet coke contained 2.5 grams carbon dioxide, what is the Molarity of carbon dioxide in this soda?
    A. 0.50 M
    B. 0.75 M
    C. 1.00 M
    D. 2.00 M