Practice Exam Water **ANSWERS**

1.  Water is **A. polar molecule with polar covalent bonds between H & O**

2.  Iodine is a solid and bromine is a liquid at STP because of **C. dispersion forces**

3.  It takes more energy to turn water into steam than ice into water because:
    **D. making steam requires breaking all of the hydrogen bonds**

4.  You melt a 9.000 gram hunk of ice at 273K in your hand without temperature change. You used how many joules to melt this ice this? **D. 3006 joules**

5.  Surface tension in water can be broken by **C. surfactants**

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

7.  When $CaCl_2$ dissolves in water **B. it is an ionic compound, so it is an electrolyte**

8.  Which compounds show a decrease in solubility as temperature rises in an aqueous solution?
    **C. $SO_2$ & HCl**

9.  Oil and vinegar do not mix. That's because **B. they are immiscible**

10. A solution that contains more solute than theoretically possible is called:
    **D. super-saturated**

11. Why does $CH_4$ have a much lower boiling point (-164°C) than $NH_3$ (-33°C)?
    **B. ammonia has many hydrogen bonds**

12. Like dissolves like would account for: **D. all three of the above**

13. Skip this one

14. When you add salt to water… **A. boiling point increases, freezing point decreases**

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**

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 60.05 grams of ice at zero centigrade to water at the same temperature is **D. 20040 joules (4SF)**

18. The energy required to heat 100.0 grams of water from 30.5°C to 47.2°C is **C. 6980 J**

19. Gases generally have lower solubility as solution temperature increases. This might explain why people tend to burp after gulping cold soda. Why does this happen?
**B. cold soda holds more $CO_2$ in solution than the soda that warms in your belly, you heat it up and the carbon dioxide comes out of solution in your stomach**

20. Water freezes at STP at    **C. 273K**

21. Water has a low vapor pressure due to its many hydrogen bonds. What is low vapor pressure?
**B. water doesn't evaporate much under glass in a sealed system**

22. What is the reason that ice floats on water?
**A. hydrogen bonds force water molecules into a 6 sided hexagon shape with space in the center**

23. When you dissolve ammonium nitrate into water
**B. the compound dissociates and the reaction is endothermic**

24. 522 grams of water has…   **C. 29.0 moles and a freezing point of 273K**

25. If you have a saturated solution of ammonia at 10°C of 1500.0 mL, and you heat it to a temperature of 90°C, and you are told that this solution cannot be supersaturated, how many grams of ammonia will come out of solution by the time it reaches the final temperature?   **C. 900 g**

How to do this last problem… use the ratio to determine how many grams of ammonia fit into a 1500 mL solution at 10°C (1050 g). Then figure how many grams of ammonia fit into the 1500 mL solution at the hotter 90°C (150 g). Subtract the starting ammonia mass from the amount that could remain in solution at the hot temperature (1050 - 150 g = 900 grams falls out of solution).