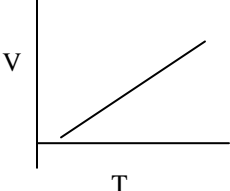
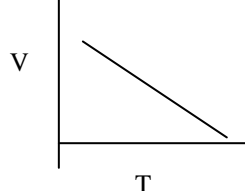
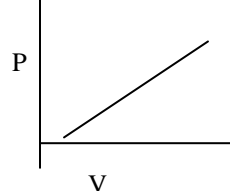
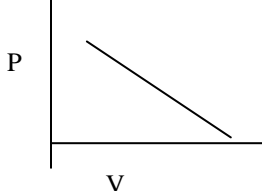


## Practice Spring Final Exam

- Which is considered matter?  
(A) energy                      (B) rain                      (C) an idea                      (D) a dream
- Which is **NOT** part of the definition of matter?  
(A) Something that you can see with your eyes.  
(B) Something that has mass.  
(C) Something that has volume.  
(D) Something that takes up space.
- What piece of lab equipment would you use to accurately measure the volume of a liquid?  
(A) beaker                      (B) test tube                      (C) graduated cylinder                      (D) hot plate
- What is the density of a liquid sample if the volume is 25 mL and the mass is 20 grams?  
(A) 0.8 g/mL                      (B) 1.3 g/mL                      (C) 45 g/mL                      (D) 500 g/mL
- In a solution of silver nitrate, water is the  
(A) solute                      (B) solvent                      (C) solution                      (D) element
- The correct way to represent a solution of copper nitrate is  
(A) Cu (s)                      (B) Cu (aq)                      (C) Cu(NO<sub>3</sub>)<sub>2</sub> (s)                      (D) Cu(NO<sub>3</sub>)<sub>2</sub> (aq)
- Which elements would you expect to have similar properties?  
(A) C and Si                      (B) Cu and Zn                      (C) N and O                      (D) H and He
- The Group VIII elements are called  
(A) alkali metals                      (B) alkaline earth metals  
(C) noble gases                      (D) halogens
- Which of the following is a transition metal?  
(A) Na                      (B) Sn                      (C) Al                      (D) Fe
- The least reactive group of elements on the periodic table is the  
(A) alkali metals                      (B) noble gases                      (C) halogens                      (D) transition metals
- How many bonds should carbon form in a structural formula?  
(A) 1                      (B) 2                      (C) 3                      (D) 4
- How many lone pairs are in a Lewis dot diagram of PH<sub>3</sub>?  
(A) 1                      (B) 2                      (C) 3                      (D) 4
- A chlorine atom forms bonds in order to get how many total valence electrons?  
(A) 2                      (B) 4                      (C) 6                      (D) 8
- In a double bond, the atoms share  
(A) 1 electron                      (B) 2 electrons                      (C) 3 electrons                      (D) 4 electrons
- The picture below is which type of representation of a molecule?  
$$\begin{array}{c} \cdot\cdot \\ \text{H} : \text{N} : \text{H} \\ \cdot\cdot \\ \text{H} \end{array}$$
  
(A) Lewis dot diagram                      (B) structural formula  
(C) molecular formula                      (D) ball-and-stick model

16. Which is NOT one of the five smell categories?  
 (A) sweet (B) putrid (C) stinky (D) fishy
17. In an ionic bond the electrons  
 (A) are shared equally (B) are shared unequally  
 (C) are not shared at all (D) are not involved in bonding
18. Which of these elements has the greatest electronegativity?  
 (A) Fr (B) At (C) Li (D) O
19. If the electronegativity difference between two atoms is extremely small, what type of bond will they form?  
 (A) ionic (B) polar covalent (C) nonpolar covalent (D) nonpolar ionic
20. Given equal masses, which substance takes up the least volume?  
 (A) Rb (1.53 g/mL) (B) Si (2.33 g/mL) (C) Li (0.534 g/mL) (D) Sb (6.69 g/mL)
21. When you make a measurement using a piece of equipment, you should read  
 (A) only the numbers you can read off of the piece of equipment.  
 (B) the numbers you can read off of the piece of equipment plus one more estimated number.  
 (C) the numbers you can read off of the piece of equipment plus two more estimated numbers.  
 (D) the numbers you can read off of the piece of equipment plus three more estimated numbers
22. Convert 33°C to K.  
 (A) 300 K (B) 450 K (C) 250 K (D) 306 K
23. Which is the correct graph for the relationship between volume and temperature?  
 (A)  (B)  (C)  (D) 
24. Calculate the volume that 0.881 mol of gas at STP will occupy.  
 (A) 19.7 L (B) 22.4 L (C) 22.4 atm (D) 19.7 mmHg
25. The weather news gives the atmospheric pressure as 2.00 atm. What is this atmospheric pressure in torr?  
 (A) 760 torr (B) 4.81 torr (C) 1813 torr (D) 1520 torr
26. A gas has a volume of 500.0 mL at -23.00 °C and 300.0 torr. What would the volume of the gas be at 227.0 °C and 600.0 torr of pressure?  
 (A) 50 L (B) 500 mL (C) 60 mL (D) 600 L
27. Assuming that the temperature of a gas stays constant, what happens to pressure when the volume increases?  
 (A) It decreases. (B) It increases.  
 (C) It remains constant. (D) It is always 0.08205 L\*atm/K\*mol.
28. A mole is equal to  
 (A) 12 (B) STP (C) 0.08206 (D)  $6.02 \times 10^{23}$
29. Which weighs more, 100 atoms of He or 100 moles of He?  
 (A) both weigh the same (B) 100 atoms of He  
 (C) 100 moles of He (D) cannot determine which weighs more
30. A gas occupies 1.56 L at 1.00 atm. What will be the volume of this gas if the pressure becomes 4.00 atm?  
 (A) 3.90 L (B) 0.39 L (C) 0.520 L (D) 520 L
31. Which gas law would you use to solve the following problem? At 1.1 atm, the volume of a beach ball is 2.3 L. Assuming that the temperature is constant, at what pressure will the volume of the balloon be 1.7 L?  
 (A)  $P_1V_1 = P_2V_2$  (B)  $P_1V_1/T_1 = P_2V_2/T_2$   
 (C)  $V_1/T_1 = V_2/T_2$  (D)  $PV = nRT$
32. What is the answer to the question above?  
 (A) 1.5 atm (B) 0.8 atm (C) 3.6 atm (D) 4.3 atm
33. Assuming that the temperature of a gas stays constant, what happens to pressure when the volume increases?  
 (A) It decreases. (B) It increases.  
 (C) It remains constant. (D) It is always 0.08205 L\*atm/K\*mol.
34. How many atoms are in 25 L of Ne gas?  
 a.  $6.02 \times 10^{23}$  b.  $1.5 \times 10^{25}$  c.  $4.2 \times 10^{23}$  d.  $6.7 \times 10^{23}$

35. Which of the following represents STP?  
 (A) 25°C, 760 mm Hg (B) 0°C, 101.3 kPa (C) 0 K, 1 atm (D) 0 K, 760 atm
36. How much space do  $5.7 \times 10^{28}$  molecules of oxygen gas occupy?  
 (A) 4227 L (B)  $2.1 \times 10^6$  mL (C)  $1.53 \times 10^{51}$  L (D)  $2.1 \times 10^6$  L
37. The mass of one mole of  $\text{Ca(OH)}_2$  is:  
 (A) 29 g (B) 38 g (C) 57 g (D) 74 g
38. How many moles are in 100 g of  $\text{O}_2$  gas?  
 (A) 1 mol (B) 1.3 mol (C) 3.1 mol (D) 6.3 mol
39. You have 3 L of  $\text{H}_2$  gas in a balloon and 3 L of  $\text{O}_2$  gas in another balloon. The balloon with  $\text{H}_2$  gas floats, while the balloon with  $\text{O}_2$  gas falls to the ground. Which of the following is NOT true?  
 (A) Both have the same volume. (B) Both have the same number of moles.  
 (C) The  $\text{O}_2$  balloon has more molecules. (D) Oxygen gas is more dense than hydrogen gas.
40. If a solution has a pH of 5, it is  
 (A) an acid (B) a base (C) neutral (D) an indicator
41. To dilute an acid, you would use  
 (A) an acid (B) a base (C) an indicator (D) water
42. The correct chemical formula for aluminum hydroxide is  
 (A)  $\text{Al}_2\text{OH}$  (B)  $\text{Al}_2(\text{OH})_3$  (C)  $\text{Al(OH)}_2$  (D)  $\text{Al(OH)}_3$
43. If you have 3 moles of glucose in 6 liters of solution, what is the molarity of the solution?  
 (A) 18 M (B) 2 M (C) 0.5 M (D) 3 M
44. Which of the following is one of the correct products of this chemical reaction?  
 $\text{CaCl}_2 + \text{Al(NO}_3)_3 \rightarrow \underline{\hspace{1cm}} + \underline{\hspace{1cm}}$   
 (A)  $\text{CaAl}$  (B)  $\text{Cl}_3(\text{NO}_3)_2$  (C)  $\text{AlCl}_2$  (D)  $\text{AlCl}_3$
45. How many moles of sodium nitrate are in 0.75 liters of a 0.5 M  $\text{NaNO}_3$  solution?  
 (A) 1.5 moles (B) 0.375 moles (C) 0.67 moles (D)  $3.75 \times 10^{-4}$  moles
46. When the equation  $\text{Fe}_2\text{O}_3 + \text{H}_2 \rightarrow \text{Fe} + \text{H}_2\text{O}$  is balanced, Fe has a coefficient of  
 (A) 6 (B) 3 (C) 2 (D) 1
47. What type of reaction is this:  $\text{AgNO}_3(\text{aq}) + \text{Cu}(\text{s}) \rightarrow \text{Ag}(\text{s}) + \text{Cu(NO}_3)_2(\text{aq})$ ?  
 (A) single displacement (B) double displacement (C) combination (D) decomposition
48. What is the pH of sour pickles if  $[\text{OH}^-] = 1.6 \times 10^{-10}\text{M}$ ?  
 (A) 9.8 (B) 4.2 (C) 3.6 (D) -9.8
49. Which of the following is one of the correct products of the chemical reaction  
 $\text{Li} + \text{Pb(NO}_3)_2 \rightarrow \underline{\hspace{1cm}} + \underline{\hspace{1cm}} ?$   
 (A)  $\text{Li}_2\text{Pb}$  (B)  $\text{Pb}$  (C)  $\text{Li(NO}_3)_2$  (D)  $\text{PbLi}$
50. What is the pOH of peaches if the pH is 4.7?  
 (A) 4.7 (B) 7 (C) 9.3 (D) 14
51. How many moles of 0.84 M sodium chloride solution would you need to have if you want to have 3.5 liters of  $\text{NaCl}$ ?  
 (A) 4.17 moles (B) 2.94 moles (C) 0.24 moles (D) 172 moles
52. If 55g of  $\text{NaOH}$  was dissolved in 550 mL of water, what is the molarity?  
 (A) 2.5 M (B) 1 M (C) 7.2 M (D) 3 M
53. How many moles of salt are in a 0.50 liter 2.0 M solution?  
 (A) 3 mol (B) 1 mol (C) 4 mol (D) 8 mol
54. How many liters of water need to be added to 2.8 moles of nitric acid to prepare a 2.0 M solution?  
 (A) 8.6L (B) 10.3 L (C) 2.2 L (D) 1.4 L
55. According to this balanced equation, how many moles of Cu are required to produce 30 moles of Ag?  
 $\text{Cu} + 2 \text{AgNO}_3 \rightarrow 2 \text{Ag} + \text{Cu(NO}_3)_2$   
 (A) 5 moles (B) 10 moles (C) 15 moles (D) 20 moles
56. In order to balance a chemical equation, you can change  
 (A) the subscripts (B) the chemical formulas (C) the reactants and the products (D) the coefficients
57. Which of the following is one of the correct products of this chemical reaction?  
 $\text{Na}_2\text{S} + \text{Fe(NO}_3)_2 \rightarrow \underline{\hspace{1cm}} + \underline{\hspace{1cm}}$   
 (A)  $\text{Na}_2\text{Fe}$  (B)  $\text{S(NO}_3)_2$  (C)  $\text{Na(NO}_3)_2$  (D)  $\text{FeS}$
58. When the equation  $\text{Fe}_2\text{O}_3 + \text{H}_2 \rightarrow \text{Fe} + \text{H}_2\text{O}$  is balanced,  $\text{H}_2$  has a coefficient of  
 (A) 6 (B) 3 (C) 2 (D) 1
59. Consider the following reaction:  
 $\text{Mg}(\text{s}) + 2 \text{HCl}(\text{aq}) \rightarrow \text{MgCl}_2(\text{aq}) + \text{H}_2(\text{g})$   
 How many liters of hydrogen,  $\text{H}_2$ , do you produce if 200 grams of hydrochloric acid,  $\text{HCl}$  reacts?  
 (A) 246.4 L (B) 50 L (C) 62.2 L (D) 101 L

60. Consider the following reaction:  

$$\text{Mg (s)} + 2 \text{HCl (aq)} \rightarrow \text{MgCl}_2 \text{ (aq)} + \text{H}_2 \text{ (g)}$$
 How many atoms of magnesium, Mg, do you need to produce 190 grams of magnesium chloride,  $\text{MgCl}_2$ ?  
 (A)  $1.2 \times 10^{24}$  (B)  $1.2 \times 10^{23}$  (C)  $12. \times 10^{24}$  (D)  $6.0 \times 10^{24}$
61. Balance the following equation:  $\text{Na (s)} + \text{O}_2 \text{ (g)} \rightarrow \text{Na}_2\text{O}$ . What coefficient will be in front of  $\text{Na}_2\text{O}$ ?  
 (A) 1 (B) 2 (C) 3 (D) 4
62. Balance the following equation:  $\text{Fe (s)} + \text{O}_2 \text{ (g)} \rightarrow \text{Fe}_2\text{O}_3 \text{ (s)}$ . What coefficient will be in front of  $\text{O}_2$ ?  
 (A) 1 (B) 2 (C) 3 (D) 4
63. How many grams of  $\text{MgO}$  will you produce if you start with 80.0g of  $\text{O}_2$ ?  

$$2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$$
  
 (A) 200 (B) 50 (C) 440 (D) 101
64. According to this balanced equation, how many moles of Cu are required to produce 10 moles of  $\text{AgNO}_3$ ?  

$$\text{Cu} + 2 \text{AgNO}_3 \rightarrow 2 \text{Ag} + \text{Cu(NO}_3)_2$$
  
 (A) 5 moles (B) 10 moles (C) 15 moles (D) 20 moles
65. When the equation  $\text{Fe}_2\text{O}_3 + \text{H}_2 \rightarrow \text{Fe} + \text{H}_2\text{O}$  is balanced, Fe has a coefficient of  
 (A) 6 (B) 3 (C) 2 (D) 1
66. How many moles of iron, Fe, are produced with 25.0 grams of magnesium, Mg?  

$$3 \text{Mg} + 1 \text{Fe}_2\text{O}_3 \rightarrow 2 \text{Fe} + 3 \text{MgO}$$
  
 (A) 0.686 moles (B) 3 moles (C) 1.5 moles (D) 6 moles
67. Acetylene gas ( $\text{C}_2\text{H}_2$ ) is produced as a result of the following reaction.  

$$\text{CaC}_2 \text{ (s)} + 2\text{H}_2\text{O (l)} \rightarrow \text{C}_2\text{H}_2 \text{ (g)} + \text{Ca(OH)}_2 \text{ (aq)}$$
  
 If 3.2 moles of  $\text{CaC}_2$  are consumed in this reaction, how many grams of  $\text{H}_2\text{O}$  are needed?  
 (A) 12.8g (B) 6.4 g (C) 115.2 g (D) 60 g
68. Acetylene gas,  $\text{C}_2\text{H}_2$ , is used in welding, produces an extremely hot flame when it burns in pure oxygen according to the following reaction.  

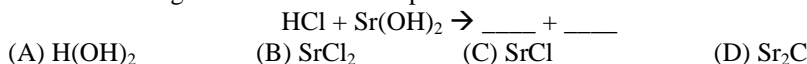
$$2 \text{C}_2\text{H}_2 \text{ (g)} + 5\text{O}_2 \text{ (g)} \rightarrow 4\text{CO}_2 \text{ (g)} + 2\text{H}_2\text{O (g)}$$
  
 How many moles of  $\text{CO}_2$  are produced when 250.0 g of  $\text{C}_2\text{H}_2$  burns completely?  
 (A) 19.23 moles (B) 9.6 moles (C) 38.46 moles (D) 60 moles
69. Laughing gas (nitrous oxide,  $\text{N}_2\text{O}$ ) is sometimes used as an anesthetic in dentistry. It is produced when ammonium nitrate is decomposed according to the following reaction.  

$$\text{NH}_4\text{NO}_3 \text{ (s)} \rightarrow \text{N}_2\text{O (g)} + 2\text{H}_2\text{O (l)}$$
  
 How many grams of  $\text{NH}_4\text{NO}_3$  are required to produce 33.0 L of  $\text{N}_2\text{O}$ ?  
 (A) 1.47 g (B) 117.9 g (C) 33.0 g (D) 2.94 g
70. For an exothermic process,  
 (A) Temperature decreases  
 (B) Energy is transferred from the solution to the environment  
 (C) The solution feels cold  
 (D) Energy is transferred from the environment to the solution
71. Which cup of water gets the hottest?  
 (A) Transferring 500 calories to 200 g of water starting at  $30^\circ\text{C}$   
 (B) Transferring 700 calories to 400 g of water starting at  $30^\circ\text{C}$   
 (C) Transferring 200 calories to 100 g of water starting at  $30^\circ\text{C}$   
 (D) Transferring 100 calories to 50 g of water starting at  $30^\circ\text{C}$
72. Which requires more energy?  
 (A) Heating 100 g of water from  $10^\circ\text{C}$  to  $30^\circ\text{C}$  (B) Heating 50 g of water from  $10^\circ\text{C}$  to  $20^\circ\text{C}$   
 (C) Heating 10 g of water from  $20^\circ\text{C}$  to  $60^\circ\text{C}$  (D) Heating 400 g of water from  $20^\circ\text{C}$  to  $30^\circ\text{C}$
73. Which of the following is NOT likely to extinguish a fire?  
 (A) Covering the fire with sand (B) Putting water on the fire  
 (C) Blowing oxygen gas on the fire (D) Blowing carbon dioxide gas on the fire
74. Which of the following will NOT combust?  
 (A)  $\text{CH}_4$  (B)  $\text{CH}_3\text{OH}$  (C) Mg (D)  $\text{CaCl}_2$
75. Which of the following will combust?  
 (A) Water (B) covalent compounds that don't contain too much oxygen  
 (C) Ionic salts (D) Carbon dioxide
76. You have water at  $25^\circ\text{C}$ . You dissolve ammonium acetate,  $\text{NH}_4\text{C}_2\text{H}_4\text{O}_2$ , in the water and find that the temperature decreases to  $15^\circ\text{C}$ .  
 (A).  $\Delta T$  is positive (B). Heat is transferred from the solution to the environment  
 (C). Exothermic process (D). Endothermic process
77. You are camping and need to build a fire that will last all night. You have the following items with you. Which will you choose?  
 (A). candle wax ( $\text{C}_{25}\text{H}_{52}$ ) (B). aluminum can (Al)  
 (C). salt, NaCl (D). packets of sugar ( $\text{C}_{12}\text{H}_{22}\text{O}_{11}$ )

78. Which is a condition of an acid solution?

- (a.) It feels soapy.
- (b.) It is held together by ionic bonds.
- (c.) It tastes sour.
- (d.) It will neutralize a buffer.

79. Which of the following is one of the correct products of this chemical reaction?



For #80-84:

Fill in the proper responses that would describe the changes that would occur due to Le Chatelier's Principle.

Choose from the following responses: **Left(A), Right(B), Increase(C), Decrease(D), Remains the Same(E).**

The following reaction takes place in a sealed container. As the reaction progresses the beaker is then heated with a hotplate.

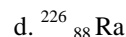
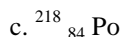
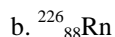
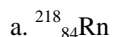
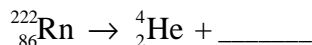


Table FA - 1		Le Chatelier's Principle		
Reaction will Shift	Concentration of Reactants	Concentration of Products	Pressure inside Beaker	Temperature inside Beaker
80.	81.	82.	83.	84.

85. The important factor in determining the stability of a nucleus is

- (A) The proton to electron ratio
- (B) The electron to neutron ratio
- (C) The neutron to proton ratio
- (D) The valence electron to core electron ratio

86. Complete the following nuclear reaction:



87. What type of decay happens in order for calcium-47 to change into scandium-47?

- (A) alpha decay
- (B) beta decay
- (C) gamma rays
- (D) a chemical reaction

Answers:

1)B 2)A 3)C 4)A 5)B 6)D 7)A 8)C 9)D 10)B 11)D 12)A 13)D 14)D 15)A 16)C 17)C 18)D 19)C 20)D 21)B 22)D 23)A 24)A 25)D 26)B 27)A 28)D 29)C 30)B 31)A 32)A 33)A 34)D 35)B 36)D 37)D 38)C 39)C 40)A 41)D 42)D 43)C 44)D 45)B 46)C 47)A 48)B 49)B 50)C 51)B 52)A 53)B 54)D 55)C 56)D 57)D 58)B 59)C 60)A 61)B 62)C 63)A 64)A 65)C 66)A 67)C 68)A 69)B 70)B 71)A 72)D 73)C 74)D 75)B 76)D 77)A 78)C 79)B 80)A 81)C 82)D 83)D 84)C 85)C 86)C 87)B

