Chemistry Common Assessment #2 Study Guide **Name: _____**

1. _____ is equal the number of protons in an atom. It is found at the top of the periodic squares.
2. _____ is the average mass of all the isotopes for an element. It's found at the bottom of the squares.
3. _____ is the sum of the protons and neutrons of an atom.
4. _____ are forms of the same element, but different numbers of neutrons.
5. _____ are atoms that have gained or lost electrons.
6. _____ Vertical columns on the periodic table. All elements in these columns have similar properties.
7. _____ Horizontal rows on the periodic table. All elements in these rows have same # of energy levels.
8. _____ the number of electrons gained or lost in order to become stable
9. _____ is the term for the outermost electrons of an atom.
10. _____ type of bonding where electrons are transferred. Formed between a metal and nonmetal .
11. _____ type of bonding where electrons are shared. Formed between two nonmetals.
12. _____ ___ are to the left of the staircase and have _____oxidation #'s, this means they _____ electrons.
13. _____ ___ are to the right of the staircase and have _____ oxidation #'s, this means they _____ electrons.
14. _____ are the elements that touch the staircase. They have properties of both metals and nonmetals.
15. _____ the sum of the oxidation numbers in an ionic bond.
16. Fill in the following chart

NAME	SYMBOL	ATOMIC #	MASS #	PROTONS	ELECTRONS	NEUTRONS	CHARGE
	$^{59}_{28}Ni$		59				0
		38			40		
			33	15			-3
		16				17	-2
	$^{56}_{25}Mn^{+1}$						
				42	40	50	

17. The amount of energy it takes to remove a valence electron is called _____ Energy.
18. The tendency for the nucleus of one atom to attract electrons of another atom into a chemical bond is _____.
19. The size of an atom is referred to as it's _____.

20. Why is the electronegativity of bromine more than gallium?
21. Why is the ionization energy of potassium much lower than that of iron?

22. Rank Sodium, Lithium and Potassium from lowest to highest electronegativity:

23. Rank Sulfur, Phosphorus, and Chlorine from smallest to largest in size:

24. Rank Silicon, Carbon, and Tin from lowest to highest ionization energy:

25. Which element from the Halogen family would have the greatest shielding effect? Why?

26. Explain the process of light emission.

27. What are the relationships between wavelength, frequency, and energy of a wave?

28. Which element is represented by the following electron configurations?

A) $1s^2 2s^2 2p^6 3s^2 3p^1$

B) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6 6s^2 4f^{14} 5d^{10} 6p^6 7s^2 5f^6$

C) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^9$

29. Write the complete configuration for the following:

A) Silver

B) Antimony

C) Phosphorous

30. Write the noble gas configuration (shorthand configuration) for the following elements:

A) Magnesium

B) Bromine

C)Gold

31. (HONORS ONLY) Calculate the wavelength of red light with a wavelength of 450 Hz.

32. (HONORS ONLY) An element emits a spectral line with a wavelength of 5.18×10^{-7} m. Determine the frequency of the wave.

33. (HONORS ONLY) Determine the energy of the wave in question 32.

34. Identify if the diagram or configuration is incorrect. If it is incorrect, explain why. If it is correct, identify the element.

a. ↑↓ ↑↓ ↑↓ _ _

1s 2s 2p

b. ↑↓ ↑↓ ↑↓ ↑↓ ↑↓ ↑↑ ↑↓ ↑↓ ↑_

1s 2s 2p 3s 3p

c. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6 6s^2$

d. [Xe] $5s^2 4d^{10} 5p^4$

e. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 4d^{10} 4p^5$

35. Name the following compounds:

A) $CaBr_2$ = _____ B) NiP = _____ C) N_3O_7= _____

D) AlF_3 = _____ E) H_2S = _____ F) $CuBr_2$ = _____

G) KNO_3= _____ H) CCl_4 = _____ I) S_2F_3= _____

J) H_2SO_4= _____ K) ZnI_3 = _____ L) H_2PO_3= _____

36. Write the correct formulas for the following compounds:

A) Lithium Sulfite = _____ B) Iron (II) Phosphide= _____ C) Tetrasulfur Pentafluoride = _____

D) Phosphoric Acid = _____ E) Barium Nitride= _____ F) Hydronitric Acid = _____

G) Copper (III) Iodide = _____ H) Aluminum Phosphate= _____ I) Calcium Oxide= _____

J) Barium Oxide = _____ K) Gallium Hydroxide = _____ L) Silicon Heptabromide = _____

Chemical Formula	**Lewis Dot Structure**	**Polar or Nonpolar Bonds**	**Polar or Nonpolar molecule**	**VSEPR Shape and bond angle**	**(HONORS) Strongest Intermolecular Force Present**
37. **CO_2**					
38. **NF_3**					
39. **SiF_2**					
40. **CBr_4**					

41. Explain which intermolecular force would act between molecules of NH_3 and draw a picture to support your answer. State whether you would expect this compound to have a relatively low or relatively high boiling point in comparison to other types of molecules *and why*.

46. List all three types of radiation (including symbols) from strongest to weakest.

47. Write the nuclear reaction for the alpha decay of Radon-224

48. Write the nuclear reaction for the beta decay of Hydrogen-3.

49. Carbon has a half life of 250 years. How much of a sample will be left after 500 years?

50. Ac-222 has a half life of 29 hours. If you start with a 82.0 gram sample, how much remains Ac-222 after 87 hours?

51. List at least 5 uses for nuclear chemistry in the world.

52. What are 3 differences between fission and fusion (i.e. atoms involved, conditions for, fuels)