Name_____ Date_____ Period_____

Review: Periodicity and Bonding Exam

1) Summarize the modern periodic law.

properties of elements are a periodic function of their atomic #

2) In the periodic table…

a) Vertical columns are called: groups or families b) Horizontal rows are called: periods

3) What is a metalloid? properties of metal and non-metal

4) What side of the periodic table contains…

a) Metals? Left b) Nonmetals? Right

5) State what family is contained in each location.

a) IA Alkali Metals b) IIA Alkaline Earth Metals c) VIIA Halogens d) VIIIA Noble gases

6) What is the most important factor in determining…

a) atomic radius? Energy level b) properties of an element? # of Valence electrons

7) What happens to atomic radius as you go…

a) across a period from left to right? decreases b) down a column? increases

8) State the location of the most reactive…

a) metals. Bottom Left Corner b) non-metals. top right corner (NOT including noble gases)

9) As far as their electrons go, state what each group desires.

a) Alkali metals Lose 1

b) Halogens Gain 1

c) Noble Gases Keep what they have!

10) Chemical bonds are formed by gaining, losing, or sharing electrons.

11) Define each of the following in terms of charge.

a) ion non-neutral b) anion negative c) cation positive

12) What is the difference between a covalent bond and an ionic bond?

↙ share e^- ↘ tranfer e^-

13) What is the difference between ionization energy and electronegativity?

↙ energy required to remove e^- ↘ tendancy to attract e^-

14) State the bond angle for each of the following geometries.

a) Linear 180° b) Trigonal Planar 120° c) Tetrahedral 109.5°

15) Tetrahedral geometry occurs when the four clouds are single bonds. Name and describe the type of clouds in the modified tetrahedral geometries.

a) Trigonal Pyramidal - 3 single bonds, 1 lone pair

b) Bent - 2 single bonds, 2 lone pair

c) Linear - 1 single bond, 3 lone pair

16) When comparing bonds or compounds, how can you determine which has the greatest ionic characteristics? The greatest difference in Electronegativity has the greatest ionic characteristics.

17) Describe the relationship between symmetry and polarity.

Symmetry → nonpolar asymmetry → polar

18) If an element is a metal, what are the possible numbers of valence electrons that it could contain?

1, 2, or 3

19) Describe the difference between polar and non-polar.

Unequal sharing of e⁻ ↵ ↳ equal sharing of e⁻

20) State the number of unpaired electrons in the atoms in each group.

a) VIIIA (8) 0 b) VIIA (7) 1 c) VIA (6) 2 d) VA (5) 3

21) Circle the molecules in which multiple covalent bonding occurs.

a) Br_2 (7) Br-Br (B) N_2 (5) :N≡N: c) P_2 (5) :P≡P: d) I_2 (7) I-I

22) Which of the following has the largest radius?

a) Ag b) Ag^{+2} (shrink) c) Te d) Te^{-2} (expand)

23) In the molecule, Br_2, each atom of bromine has an outer energy level with the electron configuration of the gas Kr. Krypton

24) Describe the location of the element with the following electron configuration:

$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^5$ (4) Row 4 Column VIIA

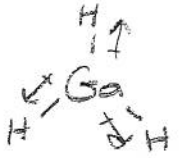
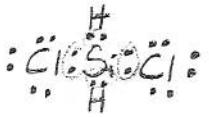
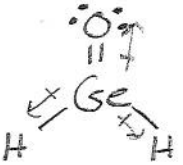
25) An element has the electron configuration: $[Ar]4s^2 3d^{10} 4p^5$. Which description best describes the element?

a) stable metal b) stable non-metal c) unstable metal d) unstable non-metal

26) An aluminum atom has three electrons in its outer energy level while iodine has seven outer electrons. Write the formula for aluminum iodide.

Al^{+3} I^{-1} AlI_3

Complete the table for the following.

#	Formula	Lewis Dot Structure	Structural Formula	Geometry	Polarity
28	$LiOBr$ 1 6 7			Bent	Polar
29	GaH_3 3 1			Trigonal Planar	Non-Polar
30	SiH_2Cl_2 4 1 7			Tetra-hedral	Polar
31	GeH_2O 4 1 6			Trigonal Planar	Polar