

**Part 1. Multiple Choice.** Circle the one alternative that best completes the statement or answers the question.

1. Which of the following is NOT a naturally occurring diatomic? (2 pts.)  
a) H<sub>2</sub>                      b) Cl<sub>2</sub>                      c) N<sub>2</sub>                      d) O<sub>2</sub>                      e) I<sub>2</sub>                      \*f) B<sub>2</sub>

**PART 2. FILL IN THE BLANK or Short Answer.**

2. How many protons does an atom of sulfur have? 16 (2 pts.)
3. What element has 14 protons? Si (1 pts.)
4. How many protons and how many neutrons are in  ${}_{24}^{53}\text{Cr}$ ? (2 pts.)  
24 p<sup>+</sup>, 29 n
5. Write the complete symbol of an atom that has 24 neutrons and 22 protons. (3 pts.)  
 ${}_{22}^{46}\text{Ti}$
6. isotopes are atoms with the same number of protons but with different numbers of neutrons. (2 pts.)
7. What is the atomic number of  ${}^{66}\text{Zn}$ ? 30 (2 pts.)
8. An ion with a positive charge is called a/an cation. (1 pt.)
9. Circle all of the products in the following reaction. (2 pts.) I can't circle in Word, so I will underline and highlight.
- $$2 \text{MgO (s)} \rightarrow \underline{2 \text{Mg (s)}} + \underline{\text{O}_2 \text{(g)}}$$
10. Identify at least one coefficient in the following reaction. (Circle it.) (1 pt.)  
2 MgO (s) → 2 Mg (s) + O<sub>2</sub> (g)
11. What happens to a neutral N atom when it forms N<sup>-3</sup> ion? (1 pts.) gains 3 electrons
12. How many total electrons does a neutral K atom have? 19 (2 pts.)

13. How many total electrons does the  $K^{+1}$  ion have? 18 (2 pts.)

14. What is the name of the group that contains Cu and Ni? (1 pt.)

transition metals

15. What is the name of the group that contains F and I? (1 pt.)

halogens

16. What is the name of the group that contains Be and Ba? (1 pt.)

alkaline earth metals

17. Classify the following elements as **metal, nonmetal, or metalloid**. (1 pt. each)

a) potassium metal

b) silicon metalloid

c) iodine nonmetal

d) barium metal

**PART 3. Balance the following reactions.** \*\*\*Write one for coefficients that are one.\*\*\*Normally we do not write coefficients of one, but on this test, I need to know if it is one or you left it blank.

18.) 6 Li (s) + 1 N<sub>2</sub> (g) → 2 Li<sub>3</sub>N (s) (3 pts.)

19.) 1 Ca(OH)<sub>2</sub> (aq) + 2 HCl (aq) → 2 H<sub>2</sub>O (l) + 1 CaCl<sub>2</sub> (aq) (3 pts.)

20.) 1 (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> (aq) + 1 Pb(NO<sub>3</sub>)<sub>2</sub> (aq) → 1 PbSO<sub>4</sub> (s) + 2 NH<sub>4</sub>NO<sub>3</sub> (aq)  
(4 pts.)

21.) 1 C<sub>2</sub>H<sub>5</sub>OH (g) + 3 O<sub>2</sub> (g) → 2 CO<sub>2</sub> (g) + 3 H<sub>2</sub>O (l) (4 pts.)

**PART 4. Fill in the English element name or the chemical symbol, whichever is missing.**  
Please print neatly with a space between letters. (1 pt. each)

a) radon Rn

b) mercury Hg

c) lead Pb

d) platinum Pt

e) Ti titanium

f) Ar argon

**PART 5. Fill in the chemical name or the chemical formula, whichever is missing. Please print neatly with a space between letters. (1-2 pts. each)**

<u>Chemical Name</u>	<u>Chemical Formula</u>
22. oxide ion	$O^{-2}$
23. nitrate ion	$NO_3^{-1}$
24. ammonium chlorite	$NH_4ClO_2$
25. calcium bicarbonate	$Ca(HCO_3)_2$
26. chlorous acid	$HClO_2$
27. lead (II) sulfite	$PbSO_3$
28. ammonia	$NH_3$
29. nickel (II) ion	$Ni^{+2}$
30. chromium (III) nitrite	$Cr(NO_2)_3$
31. pentaphosphorus decoxide	$P_5O_{10}$
32. sulfate ion	$SO_4^{-2}$
33. potassium sulfide	$K_2S$
34. iron (II) hydroxide	$Fe(OH)_2$
35. lithium carbonate	$Li_2CO_3$
36. magnesium ion	$Mg^{+2}$
37. bicarbonate ion	$HCO_3^{-1}$
38. calcium bromide	$CaBr_2$

<u>Chemical Name</u>	<u>Chemical Formula</u>
39. copper (I) chlorate	$\text{CuClO}_3$
40. sulfur hexafluoride	$\text{SF}_6$
41. nickel (II) bromide	$\text{NiBr}_2$
42. iron (II) ion	$\text{Fe}^{+2}$
43. nitric acid	$\text{HNO}_3$
44. hydrogen peroxide	$\text{H}_2\text{O}_2$
45. aluminum oxide	$\text{Al}_2\text{O}_3$
46. sulfuric acid	$\text{H}_2\text{SO}_4$
47. sodium nitride	$\text{Na}_3\text{N}$
48. lead (IV) sulfite	$\text{Pb}(\text{SO}_3)_2$
49. chlorate ion	$\text{ClO}_3^{-1}$
50. dinitrogen tetroxide	$\text{N}_2\text{O}_4$