Name (PRINT):_____ Group: _____

Achieved points	Possible points	%
	40	

Test Directions:

1. **PRINT** your name and group at the top of page 1.
2. Use a #2 pencil to mark your answer.
3. A Periodic table is attached to the end of the test.
4. A non-programmable calculator is allowed.
5. Carefully read each question and bubble your answer on the scantron answer sheet. Bubble your answer heavy and dark. Any changes must be erased carefully and completely.
6. Scratch paper is NOT allowed. You may write in the margin of the test booklet. Only answers on the scantron will be graded.
7. Attempt ALL questions in the allotted time.
8. Good Luck ☺

1. A chemist was in the lab and recorded the mass of a solid at 4.8079 g. How many significant figures is this measurement?

   A. 5
   B. 4
   C. 3
   D. 1

2. Sally and Mary were measuring the temperature at which a block of ice, $H_2O(s)$, melted. After performing the measurement three times with three different blocks of ice, Sally had an average melting point of 0.5^oC, and a range of 3.0^oC. Mary had an average melting point of 1.0^oC, and a range of 1.0^oC. The literature melting point of water is 0.0^oC. Who was more accurate? Explain.

   A. Sally was more accurate because her mean was closer to the true value for the melting point of water.
   B. Mary was more accurate because her mean was farther from the true value for the melting point of water.
   C. Sally was more accurate because her range was larger. D.
      Mary was more accurate because her range was smaller.

3. The following properties describe the element mercury (Hg). Which one is a chemical property?

   A. Its density is 13.6 g/mL
   B. It is a silver liquid at room temperature
   C. The boiling point is 357 degree Celsius
   D. HgS forms when it reacts with sulfide ions

4. What is an Atom?

   A. An atom is the basic unit of matter and consists of 3 subatomic particles called electrons, protons, and nucleus
   B. An atom is the basic unit of matter and consists of 3 subatomic particles called electrons, property, and neutrons
   C. An atom is the basic unit of matter and consists of 3 subatomic particles called electrons, protons, and neutrons
   D. An atom is the basic unit of matter and consists of 3 subatomic particles called nucleus, protons, and neutrons

5. Which of the following is a chemical change?

   A. Burning wood
   B. Boiling water
   C. Crushing a tin can
   D. All are chemical changes

6. The elements in Group 2 have similar chemical properties because each atom of these elements has the same

A. atomic number

B. mass number

C. number of electron shells

D. number of valence electrons

7. Which of the following elements is an alkaline earth metal?

A. Lithium (Li)

B. Magnesium (Mg)

C. Fluorine (F)

D. Neon (Ne)

8. A neutral atom has an outer shell electron configuration of $2s^2 2p^6$. To which of the following groups of elements does it belong?

A. Alkali metals

B. Alkaline-earth metals

C. Halogens

D. Noble gases

9.

Letter	Periodic Table Family
A	Alkali Metal
B	Alkaline Earth Metal
X	Halogen

This table above shows some families of elements in the periodic table represented by a letter. Which one of the following is a correctly balanced compound?

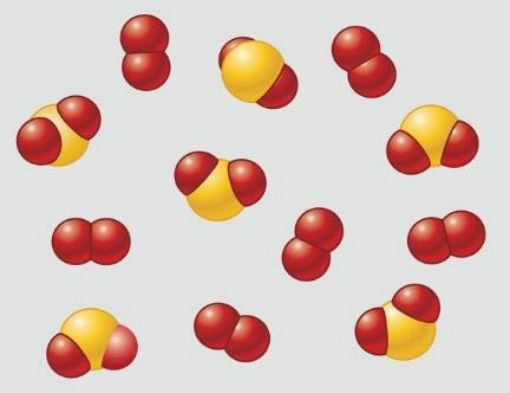
A. AX_2

B. BX

C. B_2X

D. AX

10. The following diagram depicts which of the following?



A. Pure substance
B. Mixture of elements
C. Mixture of two compounds
D. Mixture of an element and compound

11. Larissa completely dissolves 1 gram of salt in a beaker of water. The salt water is a: A.

Solute
B. Solvent
C. Suspension
D. Solution

12. To which family does an atom with an electron configuration of $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^5$ belong?

A. alkali metals
B. alkaline earth metals
C. halogens
D. noble gases

13. An atom with an electron configuration of $1s^2 2s^2 2p^3$ has how many valence electrons?

A. 2
B. 3
C. 4
D. 5

14. Identify the element with electron configuration [Ne] $3s^2\ 3p^3$

A. N

B. P

15. The correct electron configuration of Scandium is

A. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^1$

B. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^3$

C. $1s^2 2s^2 2p^6 3s^2 3p^6 3d^3$

D. $1s^1 2s^2 2p^6 3s^1 3p^6 4s^2 4p^1$

16. Which ion below would you expect to have the same electron configuration as Br^{1-}?

A. O^{2-}

B. Cl^{1-}

C. K^{+}

D. Sr^{2+}

17. Choose the following answer that lists increasing atomic radius.

A. K < Mg < Ga

B. Mg < Ag < Cs

C. V < Mn < Co

D. Br < Cl < P

18. Going down a group in the periodic table, atomic radii _____.

A. increase, because a new shell is being filled

B. increase, because electronegativity increases

C. increase, because the number of protons in the nucleus increases

D. decrease, because the number of protons in the nucleus increases

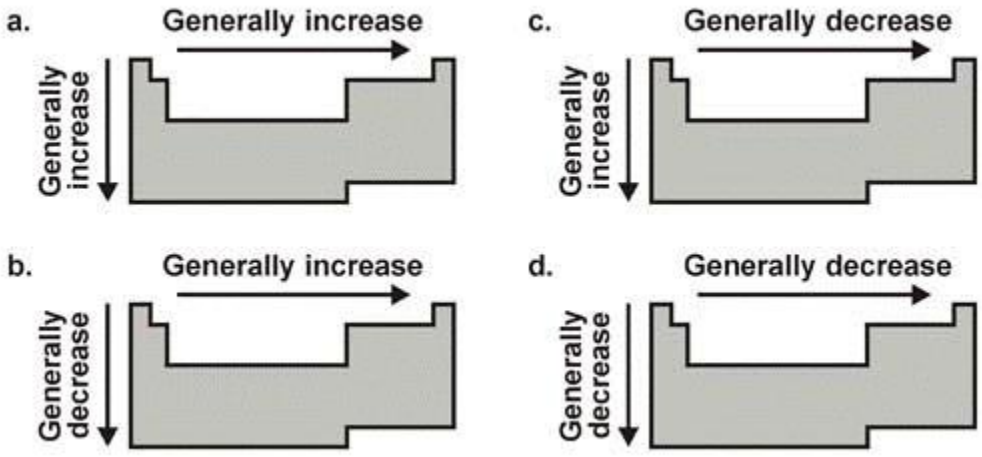
19. Elements forming anions will have ionic radii that are _____ compared to their neutral atoms.

A. larger
B. smaller
C. equal
D. negative

20. Which chemical symbols are listed in order of increasing ionization energy?

A. Al, Mg, Na
B. F, Ne, Na
C. Li, Na, K D. Sr, Ca, Mg

21. Which diagram correctly depicts the general trend in first ionization energy?



A. a
B. b
C. c D. d

22. What is the name of the compound N_2S_5?

A. Nitrogen sulfide
B. Nitrogen pentasulfide
C. Dinitrogen pentasulfide
D. Dinitrogen sulfide

23. Which formula/name pair is correct?

A. $Mn(NO_2)_2$ manganese (II) nitrate
B. $Mg(NO_3)_2$ magnesium nitride
C. $Mn(NO_3)_2$ manganese (II) nitrate
D. Mg_3N_2 magnesium nitrite

24. Choose the correct name for $NaNO_3$

A. Sodium Nitride
B. Sodium Nitrogen Oxide
C. Sodium Nitrate
D. Sodium Nitrogen Trioxide

25. Name the following ionic compound: Ca_3P_2

A. Calcium phosphate
B. Calcium phosphide
C. Calcium (III) phosphide
D. Calcium (II) phosphide

26. What is the name of the compound with the chemical formula N_2H_4?

A. Nitrogen hydrogen
B. Nitrogen hydride
C. Nitrogen tetrahydride
D. Dinitrogen tetrahydride

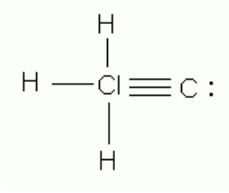
27. What is the correct name for the compound $ZnCl_2$?

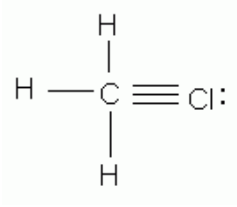
A. Zinc chloride
B. Zinc (III) chloride
C. Zinc dichloride
D. Zinc (II) chloride

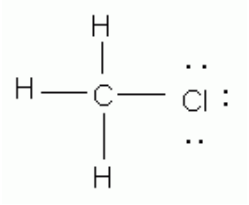
28. What is the name for $NH_4C_2H_3O_2$?

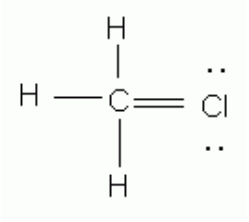
A. nitrogen dicarbon heptahydrogen dioxide
B. ammonia acetate
C. ammonium acetate
D. ammonium carbohydrate

29. What is the correct Lewis Structure for CH_3Cl?

A. 

B. 

C. 

D. 

30. Determine the number of bonds and lone pairs on the central atom (P) in PF_3.

A. 4 bonds and no lone pairs

B. 3 bonds and no lone pairs

C. 3 bonds and 2 lone pairs

D. 3 bonds and 1 lone pair

31. Balance the following chemical equation:
___Na + ___H_2O → ___NaOH + ___H_2

A. $Na_2 + H_2O_2 \rightarrow 2NaOH + H_2$

B. $2Na + 2H_2O \rightarrow 2NaOH + H_2$

C. $2Na + H_2O \rightarrow (NaOH)_2 + H_2$

D. $Na + 2H_2O \rightarrow NaOH + 2H_2$

32. Which of the following reactions DOES follow the law of conservation of matter?

A. $H_2O_2 \rightarrow H_2O + O_2$

B. $2\ Fe_2O_3 + 3\ C \rightarrow 4\ Fe + 3\ CO_2$

C. $SO_2 + O_2 + 2\ H_2O \rightarrow 4\ H_2SO_4$

D. $2\ Mg + HCl \rightarrow MgCl_2 + H_2$

33. Balance the following reaction:
___ P_4 + ___$O_2 \rightarrow$ ___P_4O_{10}

A. $P_4 + O_{10} \rightarrow P_4O_{10}$

B. $2P_4 + 5O_2 \rightarrow P_4O_{10}$

C. $5P_4 + O_2 \rightarrow (P_4O_{10})_5$

D. $P_4 + 5O_2 \rightarrow P_4O_{10}$

34. What laboratory tool is most accurate for measuring liquids?

A. Beaker

B. Test tube

C. Erlenmeyer flask

D. Graduated cylinder

35. Which is <u>not</u> an appropriate lab safety rule?

A. Report any laboratory accident, no matter how small, to you teacher immediately

B. Make sure to put unused chemicals back in their original bottles

C. Wear protective goggles and gloves for all laboratory activity

D. Check chemical labels twice to make sure you have the correct substance

36. Bubble formation, solid formation and color change are all examples of

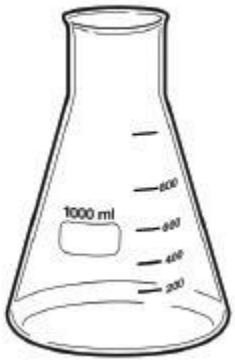
A. A route of entry

B. A lab assignment

C. A test

D. A chemical reaction

37. The following piece of lab equipment is called a(n)



A. volumetric flask.
B. graduated cylinder.
C. Erlenmeyer flask.
D. beaker.

38. Which group on the periodic table will form a -1 charge when forming an ion?

A. Noble Gases
B. Transition Metals
C. Halogens
D. Alkaline Earth Metals

39. Which of the following statements is true about the ion $^{39}_{19}K^{1+}$

A. It has 39 protons, 19 electrons and 19 neutrons
B. It has 19 protons, 39 electrons and 39 neutrons C. It has 19 protons, 18 electrons and 20 neutrons D. It has 19 protons, 19 electrons and 20 neutrons

40. Using the periodic table, predict which elements will have similar chemical properties or reactivity:

A. cadmium, calcium, and carbon

B. rubidium, yttrium, and zirconium

C. beryllium, calcium, and radium

D. nitrogen, sulfur, and bromine