$\qquad$ Class: $\qquad$ Date: $\qquad$

## Multiple Choice

Identify the choice that best completes the statement or answers the question.

## Important constants

For Water
$\Delta H_{\text {fus }}=6.01 \mathrm{~kJ} / \mathrm{mol}$ or $334 \mathrm{~J} / \mathrm{g}$
$\Delta H_{\text {vap }}=40.7 \mathrm{~kJ} / \mathrm{mol}$ or $2260 \mathrm{~J} / \mathrm{g}$
$c=4.18 \mathrm{~J} / \mathrm{g}^{\circ} \mathrm{C}$ or $1.00 \mathrm{cal} / \mathrm{g}^{\circ} \mathrm{C}$
*This is your last test.
*You will have questions over past chapters and questions over specific topics from first semester like moles, naming, prediciting products, balancing and stoichiometry.
*There will be no retake for this last test.
1.

| Table of Common Molecules |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Name | Hydrogen | Chlorine | Ammonia | Methane |
| Molecular <br> Formula | $\mathrm{H}_{2}$ | $\mathrm{Cl}_{2}$ | $\mathrm{NH}_{3}$ | $\mathrm{CH}_{4}$ |

What type of bond do all of the molecules in the table above have in common?
a. polar
c. ionic
b. metallic
d. covalent

2.

Atomic number increases $\longrightarrow$
The chart above shows the relationship between the first ionization energy and the increase in atomic number. The letter on the chart for the alkali family of elements is
a. W
c. Y
b. X
d. Z
3. What is the volume of 63.8 g of Carbon Dioxide at a pressure of 75.0 kPa and a temperature of 345 K ?
a. $\quad 22.4 \mathrm{~L}$
b. $\quad 55.4 \mathrm{~L}$
c. $\quad 8.23 \mathrm{~L}$
d. $\quad 78.4 \mathrm{~L}$
4. How much energy would be required to raise the temperature of 75.0 g of water from $25.0^{\circ} \mathrm{C}$ to $75.0^{\circ} \mathrm{C}$ ?
a. $\quad 15.7 \mathrm{~kJ}$
b. $\quad 334 \mathrm{~kJ}$
c. $\quad 1.25 \times 10^{6} \mathrm{~J}$
d. 4.85 kJ
$\qquad$ 5. What is the correct noble gas electron configuration for a Chloride ion?
a. $\quad[\mathrm{Ar}] 3 \mathrm{~s}^{2} 3 \mathrm{p}^{5}$
b. $\quad[\mathrm{Ar}] 3 \mathrm{~s}^{2} 3 \mathrm{p}^{6}$
c. $\quad[\mathrm{Ne}] 3 \mathrm{~s}^{2} 3 \mathrm{p}^{5}$
d. $\quad[\mathrm{Ne} e] 3 s^{2} 3 p^{6}$
6. What is the correct order of the following bonds in terms of decreasing polarity?
a. As-Cl, P-Cl, N-Cl
c. $\quad \mathrm{P}-\mathrm{Cl}, \mathrm{N}-\mathrm{Cl}, \mathrm{As}-\mathrm{Cl}$
b. As-Cl, N-Cl, P-Cl
d. $\quad \mathrm{P}-\mathrm{Cl}, \mathrm{As}-\mathrm{Cl}, \mathrm{N}-\mathrm{Cl}$
7. Why do atoms share electrons in covalent bonds?
a. Both atoms have a low ionization energy and want to lose electrons
c. They both need to increase their atomic numbers.
b. Both atoms have a high electronegativity and want to gain electrons.
d. The electrons in each atom are always at the same energy level.
8. How many lone pairs of electrons are on the central atom of nitrogen trihydride?
a. 1
b. 2
c. 3
d. 4
9. Which of the following covalent bonds is the most polar?
a. C---C
c. C---Cl
b. $\mathrm{C}---\mathrm{Br}$
d. C---H
$\qquad$ 10. Arrange the following elements: $\mathrm{P}^{3-}, \mathrm{S}^{2-}, \mathrm{K}^{+}, \mathrm{Ca}^{2+}, \mathrm{Sc}^{3+}$, in order of increasing ionic size.
a. $\quad \mathrm{Sc}^{3+}, \mathrm{Ca}^{2+}, \mathrm{K}^{+}, \mathrm{S}^{2-}, \mathrm{P}^{3-}$
b. $\mathrm{K}^{+}, \mathrm{Ca}^{2+}, \mathrm{Sc}^{3+}, \mathrm{S}^{2-}, \mathrm{P}^{3-}$
c. $\mathrm{P}^{3-}, \mathrm{S}^{2-}, \mathrm{K}^{+}, \mathrm{Ca}^{2+}, \mathrm{Sc}^{3+}$
d. $\quad \mathrm{Sc}^{3+}, \mathrm{Ca}^{2+}, \mathrm{K}^{+}, \mathrm{P}^{3-}, \mathrm{S}^{2-}$
$\qquad$ 11. Which of the following elements has the smallest atomic size?
a. Cesium
c. Calcium
b. Oxygen
d. Chlorine
$\qquad$ 12. If a reaction is reversible, what are the relative amounts of reactant and product at the end of the reaction?
a. no reactant; all product
b. no product; all reactant
c. some product; some reactant
d. The relationship between reactants and products cannot be determined.
13. If sulfur dioxide and oxygen can be made into sulfur trioxide, what is the reverse reaction?
a. $2 \mathrm{SO}_{3} \rightarrow 2 \mathrm{SO}_{2}+\mathrm{O}_{2}$
b. $\mathrm{SO}_{3}+\mathrm{O}_{2} \rightarrow \mathrm{SO}_{5}$
c. $2 \mathrm{SO}_{2}+\mathrm{O}_{2} \rightarrow 2 \mathrm{SO}_{3}$
d. $\mathrm{SO}_{2}+2 \mathrm{SO}_{3} \rightarrow 3 \mathrm{~S}+4 \mathrm{O}_{2}$
14. In an endothermic reaction at equilibrium, what is the effect of raising the temperature?
a. The reaction makes more products.
c. The reaction is unchanged.
b. The reaction makes more reactants.
d. The answer cannot be determined.
15. Which of the changes listed below would shift the following reaction to the right?
$4 \mathrm{HCl}(\mathrm{g})+\mathrm{O}_{2}(\mathrm{~g}) \rightleftharpoons 2 \mathrm{Cl}_{2}(\mathrm{~g})+2 \mathrm{H}_{2} \mathrm{O}(\mathrm{g})$
a. addition of $\mathrm{Cl}_{2}$
c. increase of pressure
b. removal of $\mathrm{O}_{2}$
d. decrease of pressure
16. What is the effect of adding more water to the following equilibrium reaction?
$\mathrm{CO}_{2}+\mathrm{H}_{2} \mathrm{O} \rightleftharpoons \mathrm{H}_{2} \mathrm{CO}_{3}$
a. More $\mathrm{H}_{2} \mathrm{CO}_{3}$ is produced.
b. $\mathrm{CO}_{2}$ concentration increases.
c. The equilibrium is pushed in the direction of reactants.
d. There is no effect.
17. In an equilibrium reaction with a $K_{\text {eq }}$ of $1 \times 10^{8}$, the $\qquad$ .
a. reactants are favored
c. the products are favored
b. reaction is spontaneous
d. reaction is exothermic
18. The $K_{\text {eq }}$ of a reaction is $4 \times 10^{-7}$. At equilibrium, the $\qquad$ .
a. reactants are favored
b. products are favored
c. reactants and products are present in equal amounts
d. rate of the forward reaction is much greater than the rate of the reverse reaction
19. Which of the following is a property of an acid?
a. sour taste
c. strong color
b. nonelectrolyte
d. unreactive
20. What is the formula for phosphoric acid?
a. $\mathrm{H}_{2} \mathrm{PO}_{3}$
b. $\mathrm{H}_{3} \mathrm{PO}_{4}$
c. $\mathrm{HPO}_{2}$
d. $\mathrm{HPO}_{4}$
$\qquad$ 21. Which of these is an Arrhenius base?
a. LiOH
b. $\mathrm{NH}_{3}$
c. $\mathrm{H}_{2} \mathrm{PO}_{4}^{-}$
d. $\mathrm{CH}_{3} \mathrm{COOH}$
22. What is transferred between a conjugate acid-base pair?
a. an electron
c. a hydroxide ion
b. a proton
d. a hydronium ion
23. Which compound can act as both a Brønsted-Lowry acid and a Brønsted-Lowry base?
a. water
c. sodium hydroxide
b. ammonia
d. hydrochloric acid
24. In the reaction $\mathrm{CO}_{3}{ }^{2-}+\mathrm{H}_{2} \mathrm{O} \rightleftharpoons \mathrm{HCO}_{3}{ }^{-}+\mathrm{OH}^{-}$, the carbonate ion is acting as $\mathrm{a}(\mathrm{n})$ $\qquad$ .
a. Arrhenius base
c. Brønsted-Lowry base
b. Arrhenius acid
d. Brønsted-Lowry acid
25. Which of the following reactions illustrates amphoterism?
a. $\mathrm{H}_{2} \mathrm{O}+\mathrm{H}_{2} \mathrm{O} \rightleftharpoons \mathrm{H}_{3} \mathrm{O}^{+}+\mathrm{OH}^{-}$
b. $\mathrm{NaCl} \rightleftharpoons \mathrm{Na}^{+}+\mathrm{OH}^{-}$
c. $\mathrm{HCl}+\mathrm{H}_{2} \mathrm{O} \rightleftharpoons \mathrm{H}_{3} \mathrm{O}^{+}+\mathrm{Cl}^{-}$
d. $\mathrm{NaOH} \rightleftharpoons \mathrm{Na}^{+}+\mathrm{OH}^{-}$
26. What are the acids in the following equilibrium reaction?
$\mathrm{CN}^{-}+\mathrm{H}_{2} \mathrm{O} \rightleftharpoons \mathrm{HCN}+\mathrm{OH}^{-}$
a. $\mathrm{CN}^{-}, \mathrm{H}_{2} \mathrm{O}$
b. $\mathrm{H}_{2} \mathrm{O}, \mathrm{HCN}$
c. $\mathrm{CN}^{-}, \mathrm{OH}^{-}$
d. $\mathrm{H}_{2} \mathrm{O}, \mathrm{OH}^{-}$
27. Which of the following represents a Brønsted-Lowry conjugate acid-base pair?
a. $\mathrm{SO}_{3}{ }^{2-}$ and $\mathrm{SO}_{2}$
b. $\mathrm{CO}_{3}{ }^{2-}$ and CO
c. $\mathrm{H}_{3} \mathrm{O}$ and $\mathrm{H}_{2}$
d. $\mathrm{NH}_{4}{ }^{+}$and $\mathrm{NH}_{3}$
$\qquad$ 28. What is the charge on the hydronium ion?
a. 2-
c. 0
b. $2-$
d. $1+$
$\qquad$ 29. The products of self-ionization of water are $\qquad$ -
a. $\mathrm{H}_{3} \mathrm{O}^{+}$and $\mathrm{H}_{2} \mathrm{O}$
b. $\mathrm{OH}^{-}$and $\mathrm{OH}^{+}$
c. $\mathrm{OH}^{+}$and $\mathrm{H}^{-}$
d. $\mathrm{OH}^{-}$and $\mathrm{H}^{+}$
30. In a neutral solution, the $\left[\mathrm{H}^{+}\right]$is $\qquad$ .
a. $\quad 10^{-14} \mathrm{M}$
c. $\quad 1 \times 10^{7} \mathrm{M}$
b. zero
d. equal to $\left[\mathrm{OH}^{-}\right]$
31. What is pH ?
a. the negative logarithm of the hydrogen ion concentration
b. the positive logarithm of the hydrogen ion concentration
c. the negative logarithm of the hydroxide ion concentration
d. the positive logarithm of the hydroxide ion concentration
32. Which of these solutions is the most basic?
a. $\quad\left[\mathrm{H}^{+}\right]=1 \times 10^{-2} \mathrm{M}$
b. $\left[\mathrm{OH}^{-}\right]=1 \times 10^{-4} \mathrm{M}$
c. $\left[\mathrm{H}^{+}\right]=1 \times 10^{-11} \mathrm{M}$
d. $\left[\mathrm{OH}^{-}\right]=1 \times 10^{-13} \mathrm{M}$
33. Which of the following pairs consists of a weak acid and a strong base?
a. sulfuric acid, sodium hydroxide
c. acetic acid, sodium hydroxide
b. acetic acid, ammonia
d. nitric acid, calcium hydroxide

## Multiple Response

Identify one or more choices that best complete the statement or answer the question.

For the polymer, polyvinyl chloride (PVC),
$\sim \mathrm{CH}_{2} \mathrm{CH}(\mathrm{Cl}) \mathrm{CH}_{2} \mathrm{CH}(\mathrm{Cl}) \mathrm{CH}_{2} \mathrm{CH}(\mathrm{Cl}) \sim$
34. the repeating subunit is
a. $\mathrm{CH}(\mathrm{Cl})$.
c. $\mathrm{CH}_{2} \mathrm{CH}$
$\mathrm{CH}(\mathrm{Cl}) \mathrm{CHCH}_{2}$.
d. $\mathrm{CH}_{2} \mathrm{CH}(\mathrm{Cl})$

Which substance is made up of many monomers joined together in long chains?
35.
a. salt
c. ethanol
b. protein
d. propane

Which element is capable of forming stable, extended chains of atoms through single, double, or triple bonds with itself?
36.
a. C
c. N
b. O
d. H

Proteins are large macromolecules composed of thousands of subunits. The structure of the protein depends on the sequence of
37.
a. lipids
c. amino acids
b. monosaccharides
d. nucleosides

## Equal volumes of 1 molar hydrochloric acid $(\mathrm{HCl})$ and 1 molar sodium hydroxide base $(\mathrm{NaOH})$ are mixed. After mixing, the solution will be

a. strongly acidic
c. nearly neutral
b. weakly acidic
d. weakly basic

## Potassium hydroxide ( KOH ) is a strong base because it

39. 

a. easily releases hydroxide ions
c. reacts to form salt crystals in water
b. does not dissolve in water
d. does not conduct and electric current

Of four different laboratory solutions, the
solution with the highest acidity has a pH of
40.
a. 11
b. 7
c. 5
d. 3

## Which of the following is an observable property of many acids?

41. 

a. They become slippery when reacting with water
c. They produce salts when mixed with other acids
b. They react with metals to release hydrogen gas
d. Thye beomce more acidic when mixed with a base

## Which would be most appropriate for collecting

 data during a neutralization reaction?a. a pH probe
c. a thermometer
b. a statistics program
d. a graphing program
43. An analysis of the equilibrium mixture in a 1-L flask gives the following results: $[\mathrm{HCl}]=.30$ $\mathrm{mol},\left[\mathrm{O}_{2}\right]=.20 \mathrm{~mol},\left[\mathrm{H}_{2} \mathrm{O}\right]=1.2 \mathrm{~mol}$, and $\left[\mathrm{Cl}_{2}\right]=.60$

$$
4 \mathrm{HCl}(\mathrm{~g})+\mathrm{O}_{2}(\mathrm{~g})<--->2 \mathrm{H}_{2} \mathrm{O}(\mathrm{~g})+2 \mathrm{Cl}_{2}(\mathrm{~g})+10 \mathrm{~kJ}
$$

a. $\left[\mathrm{Cl}_{2}\right]\left[\mathrm{H}_{2} \mathrm{O}\right] /[\mathrm{HCl}]\left[\mathrm{O}_{2}\right]$
b. $\left[\mathrm{Cl}_{2}\right]^{2}\left[\mathrm{H}_{2} \mathrm{O}\right]^{2} /[\mathrm{HCl}]^{4}\left[\mathrm{O}_{2}\right]$
c. $\left[\mathrm{O}_{2}\right][\mathrm{HCl}]^{4}[\mathrm{~kJ}] /\left[\mathrm{H}_{2} \mathrm{O}\right]^{2}\left[\mathrm{Cl}_{2}\right]^{2}$
d. $[\mathrm{HCl}]\left[\mathrm{O}_{2}\right] /\left[\mathrm{Cl}_{2}\right]\left[\mathrm{H}_{2} \mathrm{O}\right]$
44. An analysis of the equilibrium mixture in a 1-L flask gives the following results: $[\mathrm{HCl}]=.30$ $\mathrm{mol},\left[\mathrm{O}_{2}\right]=.20 \mathrm{~mol},\left[\mathrm{H}_{2} \mathrm{O}\right]=1.2 \mathrm{~mol}$, and $\left[\mathrm{Cl}_{2}\right]=.60$

$$
4 \mathrm{HCl}(\mathrm{~g})+\mathrm{O}_{2}(\mathrm{~g})<-->2 \mathrm{H}_{2} \mathrm{O}(\mathrm{~g})+2 \mathrm{Cl}_{2}(\mathrm{~g})+10 \mathrm{~kJ}
$$

Calculate $\mathrm{K}_{\text {eq }}$ :
a. 0.51
b. $2.2 \times 10^{2}$
c. 1.6
d. $3.3 \times 10^{2}$
45. An analysis of the equilibrium mixture in a 1-L flask gives the following results: $[\mathrm{HCl}]=.30$ $\mathrm{mol},\left[\mathrm{O}_{2}\right]=.20 \mathrm{~mol},\left[\mathrm{H}_{2} \mathrm{O}\right]=1.2 \mathrm{~mol}$, and $\left[\mathrm{Cl}_{2}\right]=.60$
$4 \mathrm{HCl}(\mathrm{g})+\mathrm{O}_{2}(\mathrm{~g}) \quad<-->2 \mathrm{H}_{2} \mathrm{O}(\mathrm{g})+2 \mathrm{Cl}_{2}(\mathrm{~g})+10 \mathrm{~kJ}$
Based on your answer for $\mathrm{K}_{\mathrm{eq}}$ are the reactants or products favored?
a. reactants
c. Both a and B
b. products
d. heat

## $\mathrm{C}_{6} \mathrm{H}_{6}+\mathrm{Br}_{2} \rightarrow \mathrm{C}_{6} \mathrm{H}_{5} \mathrm{Br}+\mathrm{HBr}$

Which of the following changes will cause an
46. increase in the rate of the above reaction?
a. increasing the concentration of Br 2
c. increasing the concentration of HBr
b. decreasing the concentration of CH66
d. decreasing the temperature
47. When a reaction is at equilibrium and more reactant is added, which of the following changes is the immediate result?
a. The reverse reaction rate remains the same.
b. The forward reaction rate increases.
c. The reverse reaction rate decreases.
d. The forward reaction rate remains the same.
48. In which of the following reactions involving gases would the forward reaction be favored by an increase in pressure?
$\mathrm{A}+\mathrm{B} \rightleftharpoons \mathrm{AB}$
c. $2 \mathrm{~A}+\mathrm{B} \rightleftharpoons \mathrm{C}+2 \mathrm{D}$
a.
c.
b. $\mathrm{A}+\mathrm{B} \rightleftharpoons \mathrm{C}+\mathrm{D}$
d.
$4 \mathrm{HCl}_{(\mathrm{g})}+\mathrm{O}_{2(\mathrm{~g})} \rightleftarrows 2 \mathrm{H}_{2} \mathrm{O}_{(\mathrm{l})}+2 \mathrm{Cl}_{2(\mathrm{~g})}+113 \mathrm{~kJ}$

Which action will drive the reaction to the
49. right?
a. heating the equilibrium mixture
c. decreasing the oxygen concentration
b. adding water to the system
d. increasing the system's pressure

$$
\mathrm{NO}_{2}(\mathrm{~g})+\mathrm{CO}(\mathrm{~g}) \rightleftharpoons \mathrm{NO}(\mathrm{~g})+\mathrm{CO}_{2}(\mathrm{~g})
$$

The reaction shown above occurs inside a closed flask. What action will shift the reaction
50. to the left?
a. pumping CO gas into the closed flask
c. increasing the NO concentration in the flask
b. raising the total pressure inside the
d. venting some CO 2 gas from the flask flask

$$
\mathrm{NH}_{4} \mathrm{Cl}(\mathrm{~s})+\text { heat } \leftrightharpoons \mathrm{NH}_{3}(\mathrm{~g})+\mathrm{HCl}(\mathrm{~g})
$$

## What kind of change will shift the reaction

51. above to the right to form more products?
a. a decrease in total pressure
c. an increase in the pressure of NH3
b. an increase in the concentration of
d. a decrease in temperature
52. Which direction best represents the effect of adding oxygen on the equilibrium position for the equation above.

$$
4 \mathrm{HCl}(\mathrm{~g})+\mathrm{O}_{2}(\mathrm{~g}) \quad<--->\quad 2 \mathrm{H}_{2} \mathrm{O}(\mathrm{~g})+2 \mathrm{Cl}_{2}(\mathrm{~g})+10 \mathrm{~kJ}
$$

a. left
c. at equilibirum
b. right
d. a and b

$$
2 \mathrm{CO}+\mathrm{O}_{2} \rightarrow 2 \mathrm{CO}_{2}
$$

If the above reaction takes place inside a sealed reaction chamber, then which of these procedures will cause a decrease in the rate of
53. reaction?
a. raising the temperature of the reaction
c. removing the CO 2 as it is formed chamber
b. increasing the volume inside the reaction chamber
d. adding more CO to the reaction chamber
$\qquad$ 54. Which reaction diagram shows the effect of using the appropriate catalyst in a chemical reaction?

A


B


C


D

a. A
c. C
b. B
d. D
55. The hydronium ion in the following reaction, $\mathrm{HI}+\mathrm{H}_{2} \mathrm{O} \quad-->\mathrm{H}_{3} \mathrm{O}^{+}+\mathrm{I}-$, would be considered a:
a. acid
c. conjugate acid
b. base
d. conjugate base
56. $\mathrm{C}_{3} \mathrm{H}_{8}+5 \mathrm{O}_{2}\left\langle-->3 \mathrm{CO}_{2}+4 \mathrm{H}_{2} \mathrm{O}\right.$

Which of these could be added to the above reaction to increase the rate of reaction over time?
a. $\mathrm{C}_{3} \mathrm{H}_{8}$ and $\mathrm{O}_{2}$
b. $\mathrm{H}_{2} \mathrm{O}$ and $\mathrm{CO}_{2}$
c. $\mathrm{O}_{2}$ and $\mathrm{CO}_{2}$
d. $\mathrm{O}_{2}$ and $\mathrm{H}_{2} \mathrm{O}$
57. Given the reaction, $\mathrm{ClO}^{2-}+\mathrm{H}_{2} \mathrm{O}-->\mathrm{HClO}^{2-}+\mathrm{OH}^{-}$ water is acting as:
a. an acid
c. a conjugate base
b. a base
d. a conjugate acid
58.
pH Levels

| $\left[\mathrm{H}_{3} 0^{+}\right]$ | $\mathbf{p H}$ | Example |
| :--- | ---: | :--- |
| $1 \times 100$ | 0 | $\mathrm{HCl}(4 \%)$ |
| $1 \times 10^{-1}$ | 1 | Stomach acid |
| $1 \times 10^{-2}$ | 2 | Lemon juice |
| $1 \times 10^{-3}$ | 3 | Vinegar |
| $1 \times 10^{-4}$ | 4 | Soda |
| $1 \times 10^{-5}$ | 5 | Rainwater |
| $1 \times 10^{-6}$ | 6 | Milk |
| $1 \times 10^{-7}$ | 7 | Pure water |
| $1 \times 10^{-8}$ | 8 | Egg whites |
| $1 \times 10^{-9}$ | 9 | Baking soda |
| $1 \times 10^{-10}$ | 10 | Ammonia |
| $1 \times 10^{-11}$ | 11 |  |
| $1 \times 10^{-12}$ | 12 | Drain cleaner |
| $1 \times 10^{-13}$ | 13 | NaOH (4\%) |
| $1 \times 10^{-14}$ | 14 |  |

Which substance is the most acidic?
a. Baking soda
c. Milk
b. Drain cleaner
d. Rainwater
59. Given the reaction $\mathrm{HSO}_{3}{ }^{-}+\mathrm{H}_{2} \mathrm{O}-->\mathrm{SO}_{3}{ }^{2-}+\mathrm{H}_{3} \mathrm{O}^{+}$, sulfite is the:
a. acid
c. conjugat acid
b. base
d. conjugate base .
60. Using the electron dot structure, a phosphide ion would most look like $\qquad$
a. : $\ddot{P}:$
b. $: \ddot{p}:$
c.

d. $[: \ddot{P} \because]^{3-}$
a. A
c. C
b. B
d. D
61. Which of the following pairs of elements is most likely to form an ionic compound?
a. magnesium and fluorine
c. nitrogen and sulfur
b. sodium and aluminum
d. oxygen and chlorine
62. Choose the correct molecular shapter for ammonia, $\mathrm{NH}_{3}$.
a. bent
c. trigonal planar
b. linear
d. trigonal pyramidal
63.


Periodic Table of the Elements


Which of the following elements has the same Lewis dot structure as Silicon?
a. Germanium
c. Gallium
b. Aluminum
d. Arsenic
64. Determine the shape of $\mathrm{SCl}_{2}$ :
a. bent
c. tetrahedral
b. linear
d. trigonal pyramidal

Practice test 2013
Answer Section

## MULTIPLE CHOICE

1. ANS: D

PTS: 1
STA: 2b
2. ANS: A

1c
PTS: 1 STA: 1c
3. ANS: B

Stt. 4h
PTS: 1
4. ANS: A

St. 7d
PTS: 1
5. ANS: D
6. ANS: A
7. ANS: B
8. ANS: A
9. ANS: C
10. ANS: A
11. ANS: B

St. 1c
PTS: 1
12. ANS: C

OBJ: 18.2.1
13. ANS: A

OBJ: 18.2.1
14. ANS: A

OBJ: 18.2.2
15. ANS: C

OBJ: 18.2.2
16. ANS: A

OBJ: 18.2.2
17. ANS: C

OBJ: 18.2.3
18. ANS: A

OBJ: 18.2.3
PTS: 1
DIF: L1
STA: Ch.8.a
PTS: 1 DIF: L2
STA: Ch.8.a
PTS: 1
DIF: L2
STA: Ch.9.a
PTS: 1
STA: Ch.9.a
PTS: 1 DIF: L2
STA: Ch.9.a
PTS: 1 DIF: L1
STA: Ch.9.c
PTS: 1
STA: Ch.9.c

REF: p. 549 | p. 550
REF: p. 549
REF: p. 554
REF: p. 554
REF: p. 552 | p. 553
REF: p. 556
REF: p. 556
19. ANS: A

OBJ: 19.1.1
20. ANS: B

OBJ: 19.1.1
21. ANS: A

OBJ: 19.1.2
22. ANS: B

OBJ: 19.1.2
23. ANS: A

OBJ: 19.1.2
24. ANS: C

OBJ: 19.1.2
25. ANS: A

OBJ: 19.1.2
26. ANS: B

OBJ: 19.1.2
27. ANS: D

OBJ: 19.1.2
28. ANS: D

OBJ: 19.2.1
29. ANS: D

OBJ: 19.2.1
30. ANS: D

OBJ: 19.2.1
31. ANS: A

OBJ: 19.2.2
32. ANS: C

OBJ: 19.2.2
33. ANS: C

OBJ: 19.3.2

PTS: 1
DIF: L1
REF: p. 587
STA: Ch.5.a
PTS: 1
DIF: L1
PTS: 1
DIF: L1
STA: Ch.5.e
PTS: 1
STA: Ch.5.e
PTS: 1 DIF: L2
STA: Ch.5.e
PTS: 1 DIF: L2
STA: Ch.5.e
PTS: 1
STA: Ch.5.e
PTS: 1
STA: Ch.5.b
PTS: 1
STA: Ch.5.e
PTS: 1
STA: Ch.5.b
PTS: 1
STA: Ch.5.c
PTS: 1
STA: Ch.5.d
PTS: 1
STA: Ch.5.f
PTS: 1
STA: Ch.5.d
PTS: 1
STA: Ch.5.c

## MULTIPLE RESPONSE

34. ANS: D

10a
PTS: 1
35. ANS: B

10b
PTS: 1
36. ANS: A 10b

PTS: 1
37. ANS: C 10c

PTS: 1
38. ANS: C 5a

PTS: 1
39. ANS: A

5c

PTS: 1
40. ANS: D

5d
PTS: 1
41. ANS: B

5a
PTS: 1
42. ANS: A

5a
PTS: 1
43. ANS: B 9b

PTS: 1
44. ANS: D

8b

PTS: 1
45. ANS: B

9b
PTS: 1
46. ANS: A 9a

PTS: 1
47. ANS: B

9a
PTS: 1
48. ANS: A

9a

PTS: 1
49. ANS: D 9b

PTS: 1
50. ANS: C

9a

PTS: 1
51. ANS: A 9a

PTS: 1
52. ANS: B

9a
PTS: 1
53. ANS: B

8a
PTS: 1
54. ANS: D

8c

PTS: 1
55. ANS: C

5b
PTS: 1
56. ANS: D 8a and 8b

PTS: 1
57. ANS: A 5b

PTS: 1
58. ANS: D 5a

PTS: 1
59. ANS: D

8b
PTS: 1
60. ANS: C

2e

PTS: 1
61. ANS: A

2c

PTS: 1
62. ANS: D 2f

PTS: 1
63. ANS: A

2e
PTS: 1
64. ANS: A 2f

PTS: 1

