$\qquad$
$\qquad$
$\qquad$

## Chapter 11 Practice Test

## Multiple Choice

Identify the choice that best completes the statement or answers the question.
*You will need your own calculator for blast from the past questions.
$\qquad$ 1. Some of the molecules found in the human body are NHCHCOOH (glycine), CHO (glucose), and $\mathrm{CH}_{3}\left(\mathrm{CH}_{2}\right)_{16} \mathrm{COOH}$ (stearic acid). The bonds they form are
a. covalent
c. metallic
b. ionic
d. nuclear
$\qquad$ 2. $\mathrm{H}_{2} \mathrm{O}_{2}$, hydrogen peroxide, naturally breaks down into $\mathrm{HO}_{2}$ and $\mathrm{O}_{2}$ over time. $\mathrm{MnO}_{2}$, manganese dioxide, can be used to lower the energy of activation needed for this reaction to take place and, thus, increase the rate of reaction. What type of substance is $\mathrm{MnO}_{2}$ ?
a. an inhibitor
c. a product
b. a catalyst
d. a reactant
$\qquad$

$$
\mathrm{C}_{3} \mathrm{H}_{8}+\mathrm{O}_{2} \longrightarrow \mathrm{CO}_{2}+\mathrm{H}_{2} \mathrm{O}
$$

This chemical equation represents the combustion of propane. When correctly balanced, the coefficient for water is
a. 2
b. 4
c. 8
d. 16
$\qquad$ 4. Which of the following is a balanced equation for the combustion of ethanol $\left(\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{OH}\right)$ ?
a. $\mathbf{C H}_{3} \mathbf{C H}_{2} \mathbf{O H}+3 \mathrm{O}_{2} \rightarrow \mathbf{C O}_{2}+2 \mathrm{H}_{2} \mathrm{O}$
b. $\mathbf{C H}_{3} \mathbf{C H}_{2} \mathrm{OH}+3 \mathrm{O}_{2} \rightarrow 2 \mathrm{CO}_{2}+3 \mathrm{H}_{2} \mathrm{O}$
c. $\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{OH}+\mathrm{O}_{2} \rightarrow 2 \mathrm{CO}_{2}+3 \mathrm{H}_{2} \mathrm{O}$
d. $\mathbf{C H}_{3} \mathrm{CH}_{2} \mathrm{OH}+3 \mathrm{O}_{2} \rightarrow 2 \mathrm{CO}_{2}+2 \mathrm{H}_{2} \mathrm{O}$

$$
\mathrm{Mg}_{3} \mathrm{~N}_{2}(\mathrm{~s})+6 \mathrm{H}_{2} \mathrm{O}(\mathrm{l}) \rightarrow
$$

$$
2 \mathrm{NH}_{3}(\mathrm{aq})+3 \mathrm{Mg}(\mathrm{OH})_{2}(\mathrm{~s})
$$

$\qquad$ 5.

Classify the following reaction.
a. combination
c. single replacement
b. double replacement
d. combustion
$\qquad$ 6. What type of reaction is the reaction below?
${ }_{-} \mathbf{a}_{-} \mathrm{Fe}_{2} \mathrm{O}_{3} \rightarrow_{-} \mathbf{b} \_\mathbf{F e}+{ }_{-} \mathbf{c} \mathbf{O}_{2}$
a. Synthesis/Combination
c. Combustion
b. Decomposition
d. Single Replacement
$\qquad$ 7. What type of reaction is the reaction below?
_a_ $\mathbf{A l}+{ }_{-} \mathbf{b}_{-} \mathrm{CuSO}_{4} \rightarrow$ _c_ $\mathbf{A l}_{2}\left(\mathrm{SO}_{4}\right)_{3}+$ _d_Cu
a. Synthesis/Combination
c. Double Replacement
b. Decomposition
d. Single Replacement
8. What type of reaction is the reaction below?
${ }_{-} \mathbf{a}_{-} \mathrm{NaF}+$ _b_ $_{-} \mathrm{AgNO}_{3} \rightarrow$ ?
a. Double Replacement
c. Synthesis/Combination
b. Decomposition
d. Single Replacement
9. What type of reaction is the reaction below?

$$
{ }_{-} \mathbf{a}_{-} \mathrm{Mg}+\_b_{-} \mathrm{H}_{2} \mathrm{SO}_{4} \rightarrow \text { ? }
$$

a. Double Replacement
c. Synthesis/Combination
b. Decomposition
d. Single Replacement
10. Select the set of coefficients that properly balance the equation below.

$$
\__{-} \mathbf{F e}_{2} \mathrm{O}_{3} \rightarrow \text { _b_Fe }+{ }_{-} \mathbf{c} \mathbf{O}_{2}
$$

a. $2,4,3$
c. $1,2,3$
b. 2, 2, 3
d. $3,4,4$
11. Select the set of coefficients that properly balance the equation below.
_a_ $\mathbf{P b}\left(\mathrm{NO}_{3}\right)_{2}+{ }_{-} \mathbf{b} \mathbf{N H}_{4} \mathrm{Cl} \rightarrow{ }_{-} \mathbf{c}_{-} \mathrm{PbCl}_{2}+{ }_{-} \mathbf{d}_{-} \mathrm{NH}_{4} \mathrm{NO}_{3}$
a. $1,2,1,2$
b. $1,2,2,1$
c. $2,1,2,1$
d. $1,2,2,2$
12. The following reactants would produce what type of reaction?
_a_NaF + _b_ $\mathrm{AgNO}_{3} \rightarrow$ ?
a. double replacement
c. combustion
b. single replacement
d. combination
13. The following reactants would produce what type of reaction? _a_Mg+_b_ $\mathrm{H}_{2} \mathrm{SO}_{4} \rightarrow$ ?
a. double replacement
c. combustion
b. single replacement
d. decomposition
14. The products created from the reactants below would be: _a_MgO + _b_ $\mathrm{H}_{2} \mathrm{O} \rightarrow$ ?
a. acid
b. base
15. The products created from the reactants below would be:

$$
{ }_{-} \mathbf{a}_{-} \mathrm{SO}_{2}+{ }^{+} \mathbf{b}_{-} \mathrm{H}_{2} \mathrm{O} \rightarrow \text { ? }
$$

a. acid
b. base
16. The products created from the reactants below would be:

$$
\text { _a_C }{ }_{-}^{C} \mathrm{H}_{3} \mathrm{OH}+\mathbf{b}_{-} \mathrm{O}_{2} \mathrm{O} \rightarrow \text { ? }
$$

a. $\mathrm{CO}_{2}+\mathbf{O H}$
b. $\mathrm{CO}_{2}+\mathbf{H}_{2} \mathbf{O}$
c. $\mathrm{CO}_{2}$
d. $\mathrm{CO}_{2}+\mathbf{H}_{2}$
17. An acid and base form what products?
a. water
c. water + salt
b. salt
d. hydrogen gas + salt
18. The correct balanced equation for the reaction below is:

a. $2,2,2,1$
c. $2,1,1,1$
b. 2,2,1,1
d. 2,1,1,2
19. Chlorine Gas is bubbled through a solution of calcium bromide at room temperature and produces bromine gas and calcium chloride. Choose all the correct product(s) for the reaction.
a. $\quad \mathrm{Br}_{2}$
b. $\quad \mathrm{Br}_{2}+\mathrm{CaCl}_{2}$
c. $\quad \mathrm{BrCl}$
d. $\quad \mathrm{CaCl}_{2}+\mathrm{Br}$
20. A flaming splint of wood is extinguished by what gas?
a. carbon dioxide
c. water
b. oxygen
d. hydrogen
21. A glowing splint of wood ignites from what gas?
a. carbon dioxide
c. water
b. oxygen
d. hydrogen
22. Phenolphthalein indicator turns pink from the presence of a:
a. base
c. acid
b. oxygen
d. water
23. $\mathrm{Cu}_{(\mathrm{s})}+\mathbf{O}_{2(\mathrm{~g})} \rightarrow \ldots$.

The following reactants would produce what type of reaction?
a. decomposition
c. double replacement
b. single replacement
d. combination
24. Two reactants are combined to produce a salt and water; these are the products of a reaction between:
a. a nonmetallic oxide and water
c. an acid and a base
b. a metallic oxide and water
d. a carbohydrate and oxygen
25. _a_ $\mathbf{L i O H}+{ }_{-} \mathbf{b}_{-} \mathbf{H}_{3} \mathrm{PO}_{4} \rightarrow$ ? + ? +...

This reaction represents a special (exceptional) case of a reaction, which is the:
a. formation of an acid
c. acid-base neutralization
b. formation of a base
d. formation of hydrogen gas
26. Hydrogen peroxide breaks down in the presence of mangenese dioxide to produce a vapor that is steam and a gas that relights a glowing splint:
a. $\quad \mathrm{H}_{2} \mathrm{O}_{(\mathrm{l})}+\mathrm{MnO}_{3(\mathrm{~g})}$
b. $\quad \mathrm{H}_{2} \mathrm{O}_{(\mathrm{g})}+\mathrm{O}_{2(\mathrm{~g})}$
c. $\quad \mathrm{H}_{2} \mathrm{O}_{(\mathrm{l})}+\mathrm{O}_{2(\mathrm{~g})}$
d. $\quad \mathrm{H}_{2} \mathrm{O}_{(\mathrm{l})}+\mathrm{MnO}_{2(\mathrm{~g})}$
27. $\ldots \mathrm{Al}+\ldots \mathrm{CuSO}_{4} \rightarrow \mathbf{C u}+\mathrm{Al}_{2}\left(\mathrm{SO}_{4}\right)_{3}$

Predict the products and then balance the reactions and choose the correct coefficients.
a. $4,3,2,6$
b. $2,1,1,3$
c. $2,3,1,3$
d. $2,1,3,6$
28. _ $\mathrm{Li}_{2} \mathrm{O}+\ldots \mathrm{H}_{2} \mathrm{O} \rightarrow$ ?

The product for this reaction could be classified as a(an)?
a. acid
b. base
29. The hydrocarbon $\mathrm{C}_{4} \mathrm{H}_{10}$ burns in the air, the correct coefficients for the balanced equation are: (write the equation first)
a. $1,7,4,5$
d. $4,26,16,20$
b. $1,4,4,5$
e. already balanced
c. $2,13,8,10$
30. Which of the following is a monatomic gas at STP?
a. Bromine
c. Fluorine
b. Nitrogen
d. Krypton
31. Which of the following are combustion reactions?

1) $\mathrm{CH}_{4}(\mathrm{~g})+\mathrm{O}_{2}(\mathrm{~g}) \rightarrow \mathrm{CO}_{2}(\mathrm{~g})+\mathrm{H}_{2} \mathrm{O}(\mathrm{l})$
2) $\mathrm{CaO}(\mathrm{s})+\mathrm{CO}_{2}(\mathrm{~g}) \rightarrow \mathrm{CaCO}_{3}(\mathrm{~s})$
3) $\mathrm{PbCO}_{3}(\mathrm{~s}) \rightarrow \mathrm{PbO}(\mathrm{s})+\mathrm{CO}_{2}(\mathrm{~g})$
4) $\mathrm{CH}_{3} \mathrm{OH}(\mathrm{l})+\mathrm{O}_{2}(\mathrm{~g}) \rightarrow \mathrm{CO}_{2}(\mathrm{~g})+\mathrm{H}_{2} \mathrm{O}(\mathrm{l})$
a. $\quad 1$ and 4
b. $1,2,3$, and 4
c. 1,3 , and 4
d. 2,3 , and 4
e. 3 and 4
32. When the following equation is balanced, the coefficients are $\qquad$ .

$$
\mathrm{C}_{8} \mathrm{H}_{18}+\mathrm{O}_{2} \rightarrow \mathrm{CO}_{2}+\mathrm{H}_{2} \mathrm{O}
$$

a. $4,50,16,18$
b. $1,5,2,2$
c. $2,2,7,1$
d. $1,13,8,9$
e. $2,25,16,18$
33. Lithium and nitrogen react to produce lithium nitride:

$$
\mathrm{Li}(\mathrm{~s})+\mathrm{N}_{2}(\mathrm{~g}) \rightarrow \mathrm{Li}_{3} \mathrm{~N}(\mathrm{~s})
$$

The correct coefficients for this reaction are:
a. $6,1,2$
b. $1,1,2$
c. $3,2,1$
d. 3,2,2
34. Of the reactions below, which one is not a combination reaction?
a. $\mathrm{C}+\mathrm{O}_{2} \rightarrow \mathrm{CO}_{2}$
b. $2 \mathrm{Mg}+\mathrm{O}_{2} \rightarrow 2 \mathrm{MgO}$
c. $2 \mathrm{~N}_{2}+3 \mathrm{H}_{2} \rightarrow 2 \mathrm{NH}_{3}$
d. $\mathrm{CaO}+\mathrm{H}_{2} \mathrm{O} \rightarrow \mathrm{Ca}(\mathrm{OH})_{2}$
e. $2 \mathrm{CH}_{4}+4 \mathrm{O}_{2} \rightarrow 2 \mathrm{CO}_{2}+4 \mathrm{H}_{2} \mathrm{O}$
35. When a hydrocarbon burns in air, what component of air reacts?
a. oxygen
b. nitrogen
c. carbon dioxide
d. water
e. argon
36. Of the reactions below, which one is a decomposition reaction?
a. $\quad \mathrm{NH}_{4} \mathrm{Cl} \rightarrow \mathrm{NH}_{3}+\mathrm{HCl}$
b. $2 \mathrm{Mg}+\mathrm{O}_{2} \rightarrow 2 \mathrm{MgO}$
c. $2 \mathrm{~N}_{2}+3 \mathrm{H}_{2} \rightarrow 2 \mathrm{NH}_{3}$
d. $2 \mathrm{CH}_{4}+4 \mathrm{O}_{2} \rightarrow 2 \mathrm{CO}_{2}+4 \mathrm{H}_{2} \mathrm{O}$
e. $\mathrm{Cd}\left(\mathrm{NO}_{3}\right)_{2}+\mathrm{Na}_{2} \mathrm{~S} \rightarrow \mathrm{CdS}+2 \mathrm{NaNO}_{3}$
37. Which of the following are combination reactions?

1) $\mathrm{CH}_{4}(\mathrm{~g})+\mathrm{O}_{2}(\mathrm{~g}) \rightarrow \mathrm{CO}_{2}(\mathrm{~g})+\mathrm{H}_{2} \mathrm{O}$ (l)
2) $\mathrm{CaO}(\mathrm{s})+\mathrm{CO}_{2}(\mathrm{~g}) \rightarrow \mathrm{CaCO}_{3}(\mathrm{~s})$
3) $\mathrm{Mg}(\mathrm{s})+\mathrm{O}_{2}(\mathrm{~g}) \rightarrow \mathrm{MgO}(\mathrm{s})$
4) $\mathrm{PbCO}_{3}(\mathrm{~s}) \rightarrow \mathrm{PbO}(\mathrm{s})+\mathrm{CO}_{2}(\mathrm{~g})$
a. 1, 2, and 3
b. 2 and 3
c. $1,2,3$, and 4
d. 4 only
e. 2,3 , and 4
38. Which of the following are decomposition reactions?
1) $\mathrm{CH}_{4}(\mathrm{~g})+\mathrm{O}_{2}(\mathrm{~g}) \rightarrow \mathrm{CO}_{2}(\mathrm{~g})+\mathrm{H}_{2} \mathrm{O}$ (l)
2) CaO (s) $+\mathrm{CO}_{2}$ (g) $\rightarrow \mathrm{CaCO}_{3}$ (s)
3) $\mathrm{Mg}(\mathrm{s})+\mathrm{O}_{2}(\mathrm{~g}) \rightarrow \mathrm{MgO}(\mathrm{s})$
4) $\mathrm{PbCO}_{3}(\mathrm{~s}) \rightarrow \mathrm{PbO}(\mathrm{s})+\mathrm{CO}_{2}(\mathrm{~g})$
a. 1,2 , and 3
b. 4 only
c. $1,2,3$, and 4
d. 2 and 3
e. 2,3 , and 4
39. When the following equation is balanced, the coefficients are $\qquad$ .

$$
\mathrm{NH}_{3}(\mathrm{~g})+\mathrm{O}_{2}(\mathrm{~g}) \rightarrow \mathrm{NO}_{2}(\mathrm{~g})+\mathrm{H}_{2} \mathrm{O}(\mathrm{~g})
$$

a. $1,1,1,1$
b. $4,7,4,6$
c. $2,3,2,3$
d. $1,3,1,2$
e. $4,3,4,3$
40. When the following equation is balanced, the coefficients are $\qquad$ .

$$
\mathrm{Al}\left(\mathrm{NO}_{3}\right)_{3}+\mathrm{Na}_{2} \mathrm{~S} \rightarrow \mathrm{Al}_{2} \mathrm{~S}_{3}+\mathrm{NaNO}_{3}
$$

a. $2,3,1,6$
b. $2,1,3,2$
c. $1,1,1,1$
d. $4,6,3,2$
e. $2,3,2,3$
41. When the following equation is balanced, the coefficient of H 2 is $\qquad$ -

$$
\mathrm{K}(\mathrm{~s})+\mathrm{H}_{2} \mathrm{O}(\mathrm{l}) \rightarrow \mathrm{KOH}(\mathrm{aq})+\mathrm{H}_{2}(\mathrm{~g})
$$

a. 1
b. 2
c. 3
d. 4
e. 5
42. When the following equation is balanced, the coefficient of Al is $\qquad$ .

$$
\mathrm{Al}(\mathrm{~s})+\mathrm{H}_{2} \mathrm{O}(\mathrm{l}) \rightarrow \mathrm{Al}(\mathrm{OH})_{3}(\mathrm{~s})+\mathrm{H}_{2}(\mathrm{~g})
$$

a. 1
b. 2
c. 3
d. 5
e. 4
43. When the following equation is balanced, the coefficient of $\mathrm{H}_{2} \mathrm{O}$ is $\qquad$ .

$$
\mathrm{Ca}(\mathrm{~s})+\mathrm{H}_{2} \mathrm{O}(\mathrm{l}) \rightarrow \mathrm{Ca}(\mathrm{OH})_{2}(\mathrm{aq})+\mathrm{H}_{2}(\mathrm{~g})
$$

a. 1
b. 2
c. 3
d. 5
e. 4
44. When the following equation is balanced, the coefficient of $\mathrm{Al}_{2} \mathrm{O}_{3}$ is $\qquad$ -.

$$
\mathrm{Al}_{2} \mathrm{O}_{3}(\mathrm{~s})+\mathrm{C}(\mathrm{~s})+\mathrm{Cl}_{2}(\mathrm{~g}) \rightarrow \mathrm{AlCl}_{3}(\mathrm{~s})+\mathrm{CO}(\mathrm{~g})
$$

a. 1
b. 2
c. 3
d. 4
e. 5
45. When the following equation is balanced, the coefficient of $\mathrm{H}_{2} \mathrm{~S}$ is $\qquad$ .

$$
\mathrm{FeCl}_{3}(\mathrm{aq})+\mathrm{H}_{2} \mathrm{~S}(\mathrm{~g}) \rightarrow \mathrm{Fe}_{2} \mathrm{~S}_{3}(\mathrm{~s})+\mathrm{HCl}(\mathrm{aq})
$$

a. 1
b. 2
c. 3
d. 5
e. 4
46. When the following equation is balanced, the coefficient of HCl is $\qquad$ .

$$
\mathrm{CaCO}_{3}(\mathrm{~s})+\mathrm{HCl}(\mathrm{aq}) \rightarrow \mathrm{CaCl}_{2}(\mathrm{aq})+\mathrm{CO}_{2}(\mathrm{~g})+\mathrm{H}_{2} \mathrm{O}(\mathrm{l})
$$

a. 1
b. 2
c. 3
d. 4
e. 0
47. When the following equation is balanced, the coefficient of $\mathrm{HNO}_{3}$ is $\qquad$ .

$$
\mathrm{HNO}_{3}(\mathrm{aq})+\mathrm{CaCO}_{3}(\mathrm{~s}) \rightarrow \mathrm{Ca}\left(\mathrm{NO}_{3}\right)_{2}(\mathrm{aq})+\mathrm{CO}_{2}(\mathrm{~g})+\mathrm{H}_{2} \mathrm{O}(\mathrm{l})
$$

a. 1
b. 2
c. 3
d. 5
e. 4
48. When the following equation is balanced, the coefficient of $\mathrm{H}_{3} \mathrm{PO}_{4}$ is $\qquad$ .

$$
\mathrm{H}_{3} \mathrm{PO}_{4}(\mathrm{aq})+\mathrm{NaOH}(\mathrm{aq}) \rightarrow \mathrm{Na}_{3} \mathrm{PO}_{4}(\mathrm{aq})+\mathrm{H}_{2} \mathrm{O}(\mathrm{l})
$$

a. 1
b. 2
c. 3
d. 4
e. 0
49. When the following equation is balanced, the coefficient of $\mathrm{C}_{3} \mathrm{H}_{8} \mathrm{O}_{3}$ is $\qquad$ .

$$
\mathrm{C}_{3} \mathrm{H}_{8} \mathrm{O}_{3}(\mathrm{~g})+\mathrm{O}_{2}(\mathrm{~g}) \rightarrow \mathrm{CO}_{2}(\mathrm{~g})+\mathrm{H}_{2} \mathrm{O}(\mathrm{~g})
$$

a. 1
b. 2
c. 3
d. 7
e. 5
50. When the following equation is balanced, the coefficient of $\mathrm{O}_{2}$ is $\qquad$ ..

$$
\mathrm{C}_{2} \mathrm{H}_{4} \mathrm{O}(\mathrm{~g})+\mathrm{O}_{2}(\mathrm{~g}) \rightarrow \mathrm{CO}_{2}(\mathrm{~g})+\mathrm{H}_{2} \mathrm{O}(\mathrm{~g})
$$

a. 2
b. 3
c. 4
d. 5
e. 1
51. Classify the following reaction.

$$
\mathrm{CO}(\mathrm{~g})+\mathrm{H}_{2}(\mathrm{~g}) \rightarrow \mathrm{H}_{2} \mathrm{O}(\mathrm{~g})+\mathrm{CH}_{4}(\mathrm{~g})
$$

a. combination
b. combustion
c. single replacement
d. double replacment
52. When the following equation is balanced, the coefficient of $\mathrm{H}_{2} \mathrm{SO}_{4}$ is $\qquad$ .

$$
\mathrm{H}_{2} \mathrm{SO}_{4}(\mathrm{aq})+\mathrm{NaOH}(\mathrm{aq}) \rightarrow \mathrm{Na}_{2} \mathrm{SO}_{4}(\mathrm{aq})+\mathrm{H}_{2} \mathrm{O}(\mathrm{l})
$$

a. 1
b. 2
c. 3
d. 4
53. When the following equation is balanced, the coefficient of water is $\qquad$ -.

$$
\mathrm{K}(\mathrm{~s})+\mathrm{H}_{2} \mathrm{O}(\mathrm{l}) \rightarrow \mathrm{KOH}(\mathrm{aq})+\mathrm{H}_{2}(\mathrm{~g})
$$

a. 1
b. 2
c. 3
d. 4
e. 5
54. When the following equation is balanced, the coefficient of hydrogen is $\qquad$ .

$$
\mathrm{K}(\mathrm{~s})+\mathrm{H}_{2} \mathrm{O}(\mathrm{l}) \rightarrow \mathrm{KOH}(\mathrm{aq})+\mathrm{H}_{2}(\mathrm{~g})
$$

a. 1
b. 2
c. 3
d. 4
e. 5
55. Balance the following equation and list the coefficients in order from left to right.

$$
\ldots \mathrm{SF}_{4}+\ldots \mathrm{H}_{2} \mathrm{O} \rightarrow \ldots \mathrm{H}_{2} \mathrm{SO}_{3}{ }^{+} \text {_ } \mathrm{HF}
$$

a. $1,1,1,4$
b. $2,6,2,8$
c. $1,2,1,4$
d. $1,3,1,4$
56. Iron metal reacts with hydrochloric acid to produce iron (II) chloride and hydrogen gas. Identify the balanced reaction that describes this process.
a. $\mathrm{Fe}+2 \mathrm{HCl} \rightarrow \mathrm{FeCl}_{2}+\mathrm{H}_{2}$
b. $\mathrm{Fe}+\mathrm{HCl} \rightarrow \mathrm{FeCl}_{2}+\mathrm{H}_{2}$
c. $\mathrm{Fe}+\mathrm{HCl} \rightarrow \mathrm{FeCl}+\mathrm{H}$
d. $2 \mathrm{Fe}+2 \mathrm{HCl} \rightarrow 2 \mathrm{FeCl}_{2}+\mathrm{H}_{2}$
57. In the chemical equation $\mathrm{H}_{2} \mathrm{O}_{2}(a q) \rightarrow \mathrm{H}_{2} \mathrm{O}(\mathrm{l})+\mathrm{O}_{2}(\mathrm{~g})$, the $\mathrm{O}_{2}$ is a $\qquad$ .
a. catalyst
c. product
b. solid
d. reactant
58. This symbol ( $\rightleftharpoons$ ) indicates that $\qquad$ .
a. heat must be applied
b. an incomplete combustion reaction has occurred
c. a gas is formed by the reaction
d. the reaction is reversible
59. In every balanced chemical equation, each side of the equation has the same number of $\qquad$ .
a. atoms of each element
c. moles
b. molecules
d. coefficients
60. When potassium hydroxide and barium chloride react, potassium chloride and barium hydroxide are formed. The balanced equation for this reaction is $\qquad$
a. $\mathrm{KH}+\mathrm{BaCl} \rightarrow \mathrm{KCl}+\mathrm{BaH}$
b. $\mathrm{KOH}+\mathrm{BaCl} \rightarrow \mathrm{KCl}+\mathrm{BaOH}$
c. $2 \mathrm{KOH}+\mathrm{BaCl}_{2} \rightarrow 2 \mathrm{KCl}+\mathrm{Ba}(\mathrm{OH})_{2}$
d. $\mathrm{KOH}+\mathrm{BaCl}_{2} \rightarrow \mathrm{KCl}_{2}+\mathrm{BaOH}$
61. Which of the following is the correct skeleton equation for the reaction that takes place when solid phosphorus combines with oxygen gas to form diphosphorus pentoxide?
a. $\mathrm{P}(\mathrm{s})+\mathrm{O}_{2}(\mathrm{~g}) \rightarrow \mathrm{PO}_{2}(\mathrm{~g})$
b. $\mathrm{P}(\mathrm{s})+\mathrm{O}(\mathrm{g}) \rightarrow \mathrm{P}_{5} \mathrm{O}_{2}(\mathrm{~g})$
c. $\mathrm{P}(\mathrm{s})+\mathrm{O}_{2}(\mathrm{~g}) \rightarrow \mathrm{P}_{2} \mathrm{O}_{5}(\mathrm{~s})$
d. $\quad \mathrm{P}_{2} \mathrm{O}_{5}(\mathrm{~s}) \rightarrow \mathrm{P}_{2}(\mathrm{~s})+\mathrm{O}_{2}(\mathrm{~g})$
62. When the equation $\mathrm{Fe}+\mathrm{Cl}_{2} \rightarrow \mathrm{FeCl}_{3}$ is balanced, what is the coefficient for $\mathrm{Cl}_{2}$ ?
a. 1
b. 2
c. 3
d. 4
63. The products of a combustion reaction do NOT include
a. water
c. carbon monoxide
b. carbon dioxide
d. hydrogen
64. The equation $\mathrm{Mg}(s)+2 \mathrm{HCl}(a q) \rightarrow \operatorname{MgCl}_{2}(a q)+\mathrm{H}_{2}(g)$ is an example of which type of reaction?
a. combination reaction
c. decomposition reaction
b. single-replacement reaction
d. double-replacement reaction
65. A solution of zinc sulfide (assume that zinc sulfide is soluble) reacts with oxygen gas to yield a solution of zinc sulfate.

The correct skeletal chemical equation for the above reaction is:
a. $\mathrm{ZnS}_{(\mathrm{l})}+\mathrm{O}_{2(\mathrm{~g})} \rightarrow \mathrm{ZnSO}_{4(\mathrm{l})}$.
b. $\mathrm{ZnS}_{(\mathrm{aq})}+\mathrm{O}_{2(\mathrm{~g})} \rightarrow \mathrm{ZnSO}_{4(\mathrm{aq})}$.
c. $\mathrm{ZnS}_{(\mathrm{l})}+\mathrm{O}_{2(\mathrm{~g})} \rightarrow \mathrm{ZnSO}_{3(\mathrm{l})}$.
d. $\mathrm{ZnS}_{(\mathrm{aq})}+\mathrm{O}_{2(\mathrm{~g})} \rightarrow \mathrm{ZnSO}_{2(\mathrm{aq})}$.
e. $\mathrm{ZnS}_{(\mathrm{aq})}+\mathrm{O}_{2(\mathrm{~g})} \rightarrow \mathrm{ZnSO}_{3(\mathrm{aq})}$.

## Chapter 11 Practice Test

Answer Section

## MULTIPLE CHOICE

1. ANS: A PTS: 1
2. ANS: B PTS: 1
3. ANS: B PTS: 1
4. ANS: B PTS: 1
5. ANS: B PTS: 1
6. ANS: B PTS: 1
7. ANS: D PTS: 1
8. ANS: A PTS: 1
9. ANS: D PTS: 1
10. ANS: A PTS: 1
11. ANS: A PTS: 1
12. ANS: A PTS: 1
13. ANS: B PTS: 1
14. ANS: B PTS: 1
15. ANS: A PTS: 1
16. ANS: B PTS: 1
17. ANS: C PTS: 1
18. ANS: A PTS: 1
19. ANS: B PTS: 1
20. ANS: A PTS: 1
21. ANS: B PTS: 1
22. ANS: A PTS: 1
23. ANS: D PTS: 1
24. ANS: C PTS: 1
25. ANS: C PTS: 1
26. ANS: B PTS: 1
27. ANS: C PTS: 1
28. ANS: B PTS: 1
29. ANS: C PTS: 1
30. ANS: D PTS: 1
31. ANS: A PTS: 1
32. ANS: E PTS: 1
33. ANS: A PTS: 1
34. ANS: E PTS: 1
35. ANS: A PTS: 1
36. ANS: A PTS: 1
37. ANS: B PTS: 1
38. ANS: B PTS: 1
39. ANS: B PTS: 1
40. ANS: A PTS: 1

KEY: Types of Reactions; Decomposition
KEY: Types of Reactions; Single Replacement
KEY: Types of Reactions; Double Replacement
KEY: Types of Reactions; Single Replacement
KEY: Balancing Equations
KEY: Balancing Equations
KEY: Predicting Products
KEY: Single Replacement;
KEY: Single Replacement;
KEY: Single Replacement;
KEY: Single Replacement;
KEY: Volume to Moles; Molar Volume
KEY: Predicting Products
KEY: Predicting Products
KEY: Predicting Products
KEY: Predicting Products
KEY: Predicting Products
KEY: Predicting Products
KEY: Predicting Products
KEY: Predicting Products
KEY: Predicting Products
41. ANS: A
42. ANS: B
43. ANS: B
44. ANS: A
45. ANS: C
46. ANS: B
47. ANS: B
48. ANS: A
49. ANS: B
50. ANS: D
51. ANS: B
52. ANS: A
53. ANS: B
54. ANS: A
55. ANS: D
56. ANS: A
57. ANS: C
58. ANS: D
59. ANS: A
60. ANS: C
61. ANS: C
62. ANS: C
63. ANS: D
64. ANS: B
65. ANS: B

PTS: 1
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