Name: _____ **Class:** _____ **Date:** _____ **ID: A**

Fall Practice Final Exam

Multiple Choice
Identify the choice that best completes the statement or answers the question.
**Final exam is 20% of your grade. Your final will be very heavy on ch 4,25,5-9 and 11.*
** You need your own cacluclator, pencil, agenda, ec passes*

____ 1. Which of the following is NOT an example of matter?
a. air
b. heat
c. smoke
d. water vapor

____ 2. All of the following are physical properties of matter EXCEPT ____.
a. mass
b. color
c. melting point
d. ability to rust

____ 3. Which of the following are considered physical properties of a substance?
a. color and odor
b. melting and boiling points
c. malleability and hardness
d. all of the above

____ 4. Which state of matter has a definite volume and takes the shape of its container?
a. solid
b. liquid
c. gas
d. both b and c

____ 5. Which state of matter is characterized by having a definite shape and a definite volume?
a. gas
b. liquid
c. solid
d. all of the above

____ 6. All of the following are physical properties of a substance in the liquid state EXCEPT ____.
a. indefinite volume
b. definite mass
c. not easily compressed
d. indefinite shape

____ 7. Which of the following is a physical change?
a. corrosion
b. explosion
c. evaporation
d. rotting of food

____ 8. Which of the following is a heterogeneous mixture?
a. air
b. salt water
c. steel
d. soil

____ 9. Separating a solid from a liquid by evaporating the liquid is called ____.
a. filtration
b. condensation
c. solution
d. distillation

____ 10. A substance that can be separated into two or more substances only by a chemical change is a(n) ____.
a. solution
b. element
c. mixture
d. compound

____ 11. Which of the following indicates that a chemical change has happened during cooking?
a. The food darkens.
b. Bubbles form in boiling water.
c. Butter melts.
d. Energy is transferred from the stove to a pan.

____ 12. Which of the following is NOT a part of Dalton's atomic theory?
a. All elements are composed of atoms.
b. Atoms are always in motion.
c. Atoms of the same element are identical.
d. Atoms that combine do so in simple whole-number ratios.

____ 13. All atoms are ____.
a. positively charged, with the number of protons exceeding the number of electrons
b. negatively charged, with the number of electrons exceeding the number of protons
c. neutral, with the number of protons equaling the number of electrons
d. neutral, with the number of protons equaling the number of electrons, which is equal to the number of neutrons

____ 14. The nucleus of an atom is ____.
a. the central core and is composed of protons and neutrons
b. positively charged and has more protons than neutrons
c. negatively charged and has a high density
d. negatively charged and has a low density

____ 15. The sum of the protons and neutrons in an atom equals the ____.
a. atomic number
b. nucleus number
c. atomic mass
d. mass number

____ 16. What does the number 84 in the name krypton-84 represent?
a. the atomic number
b. the mass number
c. the sum of the protons and electrons
d. twice the number of protons

____ 17. All atoms of the same element have the same ____.
a. number of neutrons
b. number of protons
c. mass numbers
d. mass

____ 18. Isotopes of the same element have different ____.
a. numbers of neutrons
b. numbers of protons
c. numbers of electrons
d. atomic numbers

____ 19. The mass number of an element is equal to ____.
a. the total number of electrons in the nucleus
b. the total number of protons and neutrons in the nucleus
c. less than twice the atomic number
d. a constant number for the lighter elements

____ 20. If E is the symbol for an element, which two of the following symbols represent isotopes of the same element?

1. $^{20}_{10}\mathrm{E}$ 2. $^{20}_{11}\mathrm{E}$ 3. $^{21}_{9}\mathrm{E}$ 4. $^{21}_{10}\mathrm{E}$

a. 1 and 2
b. 3 and 4
c. 1 and 4
d. 2 and 3

____ 21. Which of the following sets of symbols represents isotopes of the same element?
a. $^{91}_{42}\mathrm{J}$ $^{92}_{42}\mathrm{J}$ $^{93}_{40}\mathrm{J}$
b. $^{50}_{19}\mathrm{L}$ $^{50}_{20}\mathrm{L}$ $^{50}_{21}\mathrm{L}$
c. $^{84}_{38}\mathrm{M}$ $^{86}_{38}\mathrm{M}$ $^{87}_{38}\mathrm{M}$
d. $^{138}_{59}\mathrm{Q}$ $^{133}_{55}\mathrm{Q}$ $^{133}_{54}\mathrm{Q}$

____ 22. How do the isotopes hydrogen-1 and hydrogen-2 differ?
a. Hydrogen-2 has one more electron than hydrogen-1.
b. Hydrogen-2 has one neutron; hydrogen-1 has none.
c. Hydrogen-2 has two protons; hydrogen-1 has one.
d. Hydrogen-2 has one proton; hydrogen-1 has none.

____ 23. Which of the following equals one atomic mass unit?
a. the mass of one electron
b. the mass of one helium-4 atom
c. the mass of one carbon-12 atom
d. one-twelfth the mass of one carbon-12 atom

____ 24. The atomic mass of an element is the ____.
a. total number of subatomic particles in its nucleus
b. weighted average of the masses of the isotopes of the element
c. total mass of the isotopes of the element
d. average of the mass number and the atomic number for the element

____ 25. What type of ions have names ending in *-ide*?
a. only cations
b. only anions
c. only metal ions
d. only gaseous ions

____ 26. What is the correct name for the N^{3-} ion?
a. nitrate ion
b. nitrogen ion
c. nitride ion
d. nitrite ion

____ 27. The nonmetals in Groups 6A and 7A ____.
a. lose electrons when they form ions
b. have a numerical charge that is found by subtracting 8 from the group number
c. all have ions with a $^{-}1$ charge
d. end in *-ate*

____ 28. An *-ate* or *-ite* at the end of a compound name usually indicates that the compound contains ____.
a. fewer electrons than protons
b. neutral molecules
c. only two elements
d. a polyatomic anion

____ 29. Which of the following formulas represents an ionic compound?
a. CS_2
b. BaI_2
c. N_2O_4
d. PCl_3

____ 30. Which of the following compounds contains the lead(II) ion?
a. PbO
b. $PbCl_4$
c. Pb_2O
d. Pb_2S

____ 31. What is the correct formula for potassium sulfite?
a. $KHSO_3$
b. $KHSO_4$
c. K_2SO_3
d. K_2SO_4

____ 32. Which set of chemical name and chemical formula for the same compound is correct?
a. ammonium sulfite, $(NH_4)_2S$
b. iron(III) phosphate, $FePO_4$
c. lithium carbonate, $LiCO_3$
d. magnesium dichromate, $MgCrO_4$

____ 33. Which of the following formulas represents a molecular compound?
a. ZnO
b. Xe
c. SO_2
d. BeF_2

____ 34. What is the name of H_2SO_3?
a. hyposulfuric acid
b. hydrosulfuric acid
c. sulfuric acid
d. sulfurous acid

____ 35. What is the formula for sulfurous acid?
a. H_2SO_4
b. H_2SO_3
c. H_2SO_2
d. H_2S

____ 36. What is the formula for phosphoric acid?
a. H_2PO_3
b. H_3PO_4
c. HPO_2
d. HPO_4

____ 37. What is the correct name for the compound $CoCl_2$?
a. cobalt(I) chlorate
b. cobalt(I) chloride
c. cobalt(II) chlorate
d. cobalt(II) chloride

____ 38. What is the correct formula for barium chlorate?
a. $Ba(ClO)_2$
b. $Ba(ClO_2)_2$
c. $Ba(ClO_3)_2$
d. $BaCl_2$

____ 39. Which of the following is the correct name for N_2O_5?
a. nitrous oxide
b. dinitrogen pentoxide
c. nitrogen dioxide
d. nitrate oxide

____ 40. A catalyst is ____.
a. the product of a combustion reaction
b. not used up in a reaction
c. one of the reactants in single-replacement reactions
d. a solid product of a reaction

____ 41. What are the coefficients that will balance the skeleton equation below?
$N_2 + H_2 \rightarrow NH_3$
a. 1, 1, 2
b. 1, 3, 3
c. 3, 1, 2
d. 1, 3, 2

____ 42. Chemical equations must be balanced to satisfy ____.
a. the law of definite proportions
b. the law of multiple proportions
c. the law of conservation of mass
d. Avogadro's principle

____ 43. What are the missing coefficients for the skeleton equation below?
$Cr(s) + Fe(NO_3)_2(aq) \rightarrow Fe(s) + Cr(NO_3)_3(aq)$
a. 4, 6, 6, 2
b. 2, 3, 2, 3
c. 2, 3, 3, 2
d. 1, 3, 3, 1

____ 44. Classify the type of reaction $2Al + 6HCl \rightarrow 2AlCl_3 + 3H_2$.
a. double replacement
b. single replacement
c. decomposition
d. combustion

____ 45. Which of the following is a balanced equation representing the decomposition of lead(IV) oxide?
a. $PbO_2 \rightarrow Pb + 2O$
b. $PbO_2 \rightarrow Pb + O_2$
c. $Pb_2O \rightarrow 2Pb + O$
d. $PbO \rightarrow Pb + O_2$

____ 46. In a double-replacement reaction the reactants are usually:
a. one compound
b. single element and one compound
c. two compounds
d. hydrocarbon and oxygen

____ 47. The complete combustion of which of the following substances produces carbon dioxide and water?

a. C_8H_{18}
b. K_2CO_3
c. $CaHCO_3$
d. NO

____ 48. The reaction $2Fe + 3Cl_2 \rightarrow 2FeCl_3$ is an example of which type of reaction?

a. combustion reaction
b. single-replacement reaction
c. combination reaction
d. decomposition reaction

____ 49. Matter is made of atoms that have positive centers of neutrons and protons surrounded by a cloud of negatively charged electrons. This statement is

a. a theory.
b. a hypothesis.
c. an inference.
d. an observation.

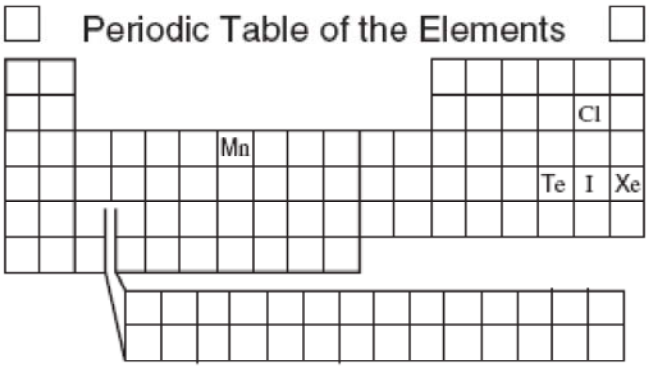
____ 50. A metallic oxide mixed with water will produce what type of compound?

a. acid
b. base

____ 51. Why is cobalt (Co) placed before nickel (Ni) on the periodic table of the elements even though it has a higher average atomic mass than nickel?

a. Nickel has one more proton.
b. Cobalt was discovered first.
c. Nickel has fewer electrons.
d. Cobalt has a lower density.

____ 52.



Iodine would have chemical properties *most* like

a. manganese (Mn)
b. tellurium (Te)
c. chlorine (Cl).
d. xenon (Xe).

____ 53.

Results of Firing Alpha Particles at Gold Foil

Observation:	Proportion:
Alpha particles went straight through gold foil.	> 98%
Alpha particles went through gold foil but were deflected at large angles.	≈ 2%
Alpha particles bounced off gold foil.	≈ 0.01%

What information do the experimental results above reveal about the nucleus of the gold atom?

a. The nucleus contains less than half the mass of the atom.
b. The nucleus is small and is the densest part of the atom.
c. The nucleus contains small positive and negative particles.
d. The nucleus is large and occupies most of the atom's space.

____ 54. Why are enormous amounts of energy required to separate a nucleus into its component protons and neutrons even though the protons in the nucleus repel each other?

a. The force of the protons repelling each other is small compared to the attraction of the neutrons to each other.
b. The electrostatic forces acting between other atoms lowers the force of repulsion of the protons.
c. The interactions between neutrons and electrons neutralize the repulsive forces between the protons.
d. The forces holding the nucleus together are much stronger than the repulsion between the protons.

____ 55.

Which equation correctly represents the alpha decay of polonium-214?

A

$$^{214}_{84}\text{Po} \rightarrow ^{214}_{85}\text{Po} + ^{0}_{-1}\text{e}$$

B

$$^{214}_{84}\text{Po} + ^{2}_{4}\text{He} \rightarrow ^{216}_{90}\text{Th}$$

C

$$^{214}_{84}\text{Po} \rightarrow ^{210}_{82}\text{Pb} + ^{4}_{2}\text{He}$$

D

$$^{214}_{84}\text{Po} \rightarrow ^{214}_{82}\text{Pb} + ^{0}_{2}\text{He}$$

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

____ 56. A 2-cm-thick piece of cardboard placed over a radiation source would be *most* effective in protecting against which type of radiation?

a. alpha
b. beta
c. gamma
d. x-ray

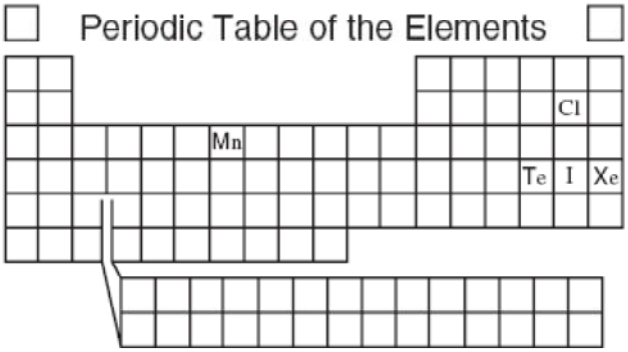
____ 57. All atoms are _____.

a. positively charged, with the number of protons exceeding the number of electrons
b. neutral, with the number of protons equaling the number of neutrons, which is equal to half the number of electrons negatively charged.
c. neutral, with the number of protons equaling the number of electrons
d. neutral, with the number of electrons equally the number of neutrons.

____ 58. Two science students discovered that the mass of a sample of acetone in an open beaker decreased within a few minutes. One student hypothesized that the acetone reacted with oxygen to form a gaseous compound that escaped. The other student believed that the acetone evaporated. What should the students do to test the hypothesis?

a. combine the hypothesis so they give valid predictions
b. conduct a study of original papers describing the experiments leading to acetone's discovery
c. perform an experiment that attempts to identify the gas above the open beaker
d. ask a classmate's opinion about the chemical and physical properties of acetone

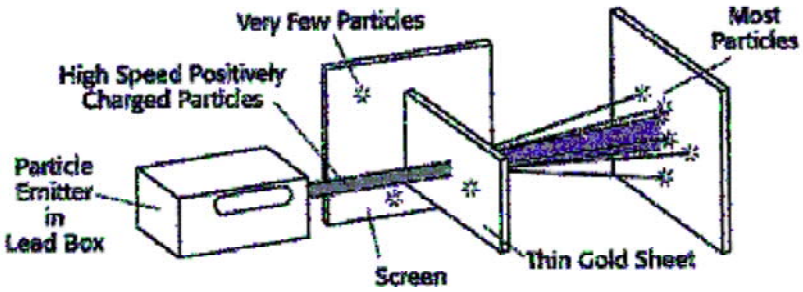
____ 59.



The element Mn would be classified as a

a. noble gas
b. halogen
c. transition metal
d. alkali earth metal

____ 60.



The illustration below shows the gold-foil experiment conducted by Ernest Rutherford. According to the drawing, most of the positively charged particles that were "shot" at the foil went straight through the gold foil without changing course. After analyzing the results of this test, Rutherford concluded that

a. atoms are completely solid.
b. atoms are made up of positive and negative charges all mixed together.
c. an atom has a solid, positively charge nucleus surrounded by electrons.
d. gold atoms are more loosely packed than most other metal atoms.

____ 61. Which of the following is a monatomic gas at STP?

a. Chlorine
b. Florine
c. Helium
d. Nitrogen

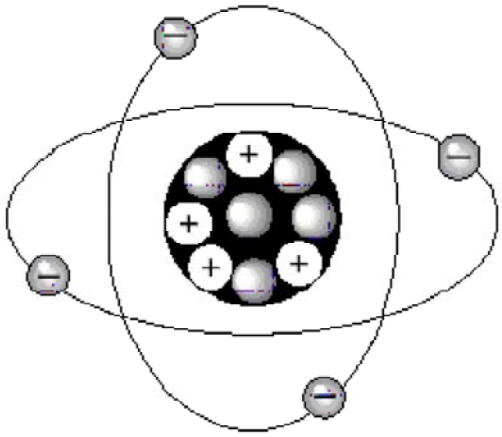
____ 62. A nonmetallic oxide mixed with water will produce what type of compound?
a. acid b. base

____ 63. When cation and anion join, they form what kind of chemical bond?
a. Ionic c. Molecular
b. Hydrogen d. Metallic

Table of Common Molecules				
Name	Hydrogen	Chlorine	Ammonia	Methane
Molecular Formula	H_2	Cl_2	NH_3	CH_4

____ 64.
What type of bond to all of these compounds have in common?
a. Covalent c. hydrogen
b. ionic d. metallic

____ 65.



The picture is a model for which element?
a. Carbon c. Beryllium
b. Florine d. Nitrogen

____ 66. Which compound represents an ionic compound?
a. SF_6 c. F_2
b. $NaHCO_3$ d. CH_4

____ 67. Which of the following compounds is an acid?
a. H_2O c. H_2SO_4
b. NH_3 d. LiH

____ 68. $C_3H_8 + O_2 \longrightarrow CO_2 + H_2O$

This chemical equation represents the combustion of propane. When correctly balanced, the coefficient for water is
a. 2 c. 8
b. 4 d. 16

____ 69. How many energy sublevels are in the second principal energy level?
a. 1 c. 3
b. 2 d. 4

____ 70. What is the maximum number of *f* orbitals in any single energy level in an atom?
a. 1
b. 3
c. 5
d. 7

____ 71. The letter "*p*" in the symbol $4p^3$ indicates the ____.
a. spin of an electron
b. orbital shape
c. principle energy level
d. speed of an electron

____ 72. If the spin of one electron in an orbital is clockwise, what is the spin of the other electron in that orbital?
a. zero
b. clockwise
c. counterclockwise
d. both clockwise and counterclockwise

____ 73. What types of atomic orbitals are in the third principal energy level?
a. *s* and *p* only
b. *p* and *d* only
c. *s*, *p*, and *d* only
d. *s*, *p*, *d*, and *f*

____ 74. What is the next atomic orbital in the series 1*s*, 2*s*, 2*p*, 3*s*, 3*p*?
a. 2*d*
b. 3*d*
c. 3*f*
d. 4*s*

____ 75. What is the number of electrons in the outermost energy level of an oxygen atom?
a. 2
b. 4
c. 6
d. 8

____ 76. How many half-filled orbitals are in a bromine atom?
a. 1
b. 2
c. 3
d. 4

____ 77. Stable electron configurations are likely to contain ____.
a. filled energy sublevels
b. fewer electrons than unstable configurations
c. unfilled *s* orbitals
d. electrons with a clockwise spin

____ 78. Which of the following electron configurations of outer sublevels is the most stable?
a. $4d^5 5s^1$
b. $4d^4 5s^2$
c. $4d^3 5s^3$
d. $4d^2 5s^4$

____ 79. How does the speed of visible light compare with the speed of gamma rays, when both speeds are measured in a vacuum?
a. The speed of visible light is greater.
b. The speed of gamma rays is greater.
c. The speeds are the same.
d. No answer can be determined from the information given.

____ 80. Which color of visible light has the shortest wavelength?
a. yellow
b. green
c. blue
d. violet

____ 81. Which type of electromagnetic radiation includes the wavelength 10^{-7} m?
a. gamma ray
b. microwave
c. radio wave
d. visible light

____ 82. The light given off by an electric discharge through sodium vapor is ____.
a. a continuous spectrum
b. an emission spectrum
c. of a single wavelength
d. white light

____ 83. What are quanta of light called?
a. charms
b. excitons
c. muons
d. photons

____ 84. Which scientist developed the quantum mechanical model of the atom?
a. Albert Einstein
b. Erwin Schrodinger
c. Niels Bohr
d. Ernest Rutherford

____ 85. Which of the following elements is in the same period as phosphorus?
a. carbon
b. magnesium
c. nitrogen
d. oxygen

____ 86. Each period in the periodic table corresponds to ____.
a. a principal energy level
b. an energy sublevel
c. an orbital
d. a suborbital

____ 87. The modern periodic table is arranged in order of increasing atomic ____.
a. mass
b. charge
c. number
d. radius

____ 88. Of the elements Pt, V, Li, and Kr, which is a nonmetal?
a. Pt
b. V
c. Li
d. Kr

____ 89. To what category of elements does an element belong if it is a poor conductor of electricity?
a. transition elements
b. metalloids
c. nonmetals
d. metals

____ 90. Which of the following is true about the electron configurations of the noble gases?
a. The highest occupied *s* and *p* sublevels are completely filled.
b. The highest occupied *s* and *p* sublevels are partially filled.
c. The electrons with the highest energy are in a *d* sublevel.
d. The electrons with the highest energy are in an *f* sublevel.

____ 91. Elements that are characterized by the filling of *p* orbitals are classified as ____.
a. groups 3A through 8A
b. transition metals
c. inner transition metals
d. groups 1A and 2A

____ 92. Which subatomic particle plays the greatest part in determining the properties of an element?
a. proton
b. electron
c. neutron
d. none of the above

____ 93. Which of the following groupings contains only representative elements?
a. Cu, Co, Cd
b. Ni, Fe, Zn
c. Al, Mg, Li
d. Hg, Cr, Ag

____ 94. Which of the following is true about the electron configurations of the representative elements?
a. The highest occupied *s* and *p* sublevels are completely filled.
b. The highest occupied *s* and *p* sublevels are partially filled.
c. The electrons with the highest energy are in a *d* sublevel.
d. The electrons with the highest energy are in an *f* sublevel.

____ 95. What element in the second period has the largest atomic radius?
a. carbon
b. lithium
c. potassium
d. neon

____ 96. Which of the following statements is true about ions?
a. Cations form when an atom gains electrons.
b. Cations form when an atom loses electrons.
c. Anions form when an atom gains protons.
d. Anions form when an atom loses protons.

____ 97. In which of the following groups of ions are the charges all shown correctly?
a. Li^{-}, O^{2-}, S^{2+}
b. Ca^{2+}, Al^{3+}, Br^{-}
c. K^{2-}, F^{-}, Mg^{2+}
d. Na^{+}, I^{-}, Rb^{-}

____ 98. For Group 2A metals, which electron is the most difficult to remove?
a. the first
b. the second
c. the third
d. All the electrons are equally difficult to remove.

____ 99. Which of the following elements has the lowest electronegativity?
a. lithium
b. carbon
c. bromine
d. fluorine

____ 100. Which statement is true about electronegativity?
a. Electronegativity is the ability of an anion to attract another anion.
b. Electronegativity generally increases as you move from top to bottom within a group.
c. Electronegativity generally is higher for metals than for nonmetals.
d. Electronegativity generally increases from left to right across a period.

____ 101. Compared with the electronegativities of the elements on the left side of a period, the electronegativities of the elements on the right side of the same period tend to be ____.
a. lower
b. higher
c. the same
d. unpredictable

____ 102. Which of the following statements correctly compares the relative size of an ion to its neutral atom?
a. The radius of an anion is greater than the radius of its neutral atom.
b. The radius of an anion is identical to the radius of its neutral atom.
c. The radius of a cation is greater than the radius of its neutral atom.
d. The radius of a cation is identical to the radius of its neutral atom.

____ 103. Which of the following factors contributes to the increase in ionization energy from left to right across a period?
a. an increase in the shielding effect
b. an increase in the size of the nucleus
c. an increase in the number of protons
d. fewer electrons in the highest occupied energy level

____ 104. How many valence electrons are in an atom of magnesium?
a. 2
b. 3
c. 4
d. 5

____ 105. How does calcium obey the octet rule when reacting to form compounds?
a. It gains electrons.
b. It gives up electrons.
c. It does not change its number of electrons.
d. Calcium does not obey the octet rule.

____ 106. What is the electron configuration of the calcium ion?
a. $1s^2 2s^2 2p^6 3s^2 3p^6$
b. $1s^2 2s^2 2p^6 3s^2 3p^4 4s^2$
c. $1s^2 2s^2 2p^6 3s^2 3p^5 4s^1$
d. $1s^2 2s^2 2p^6 3s^2$

____ 107. The octet rule states that, in chemical compounds, atoms tend to have ____.
a. the electron configuration of a noble gas
b. more protons than electrons
c. eight electrons in their principal energy level
d. more electrons than protons

____ 108. How many electrons does barium have to give up to achieve a noble-gas electron configuration?
a. 1
b. 2
c. 3
d. 4

____ 109. What is the formula of the ion formed when potassium achieves noble-gas electron configuration?
a. K^{2+}
b. K^{+}
c. K^{1-}
d. K^{2-}

____ 110. Which of the following elements does NOT form an ion with a charge of 1+?
a. fluorine
b. hydrogen
c. potassium
d. sodium

____ 111. The electron configuration of a fluoride ion, F^{-}, is ____.
a. $1s^2 2s^2 2p^5$
b. the same as that of a neon atom
c. $1s^2 2s^2 2p^6 3s^1$
d. the same as that of a potassium ion

____ 112. A compound held together by ionic bonds is called a ____.
a. diatomic molecule
b. polar compound
c. covalent molecule
d. salt

____ 113. How many valence electrons are transferred from the nitrogen atom to potassium in the formation of the compound potassium nitride?
a. 0
b. 1
c. 2
d. 3

____ 114. How many valence electrons are transferred from the calcium atom to iodine in the formation of the compound calcium iodide?
a. 0
b. 1
c. 2
d. 3

____ 115. What is the formula unit of sodium nitride?
a. NaN
b. Na_2N
c. Na_3N
d. NaN_3

____ 116. Ionic compounds are normally in which physical state at room temperature?
a. solid
b. liquid
c. gas
d. plasma

____ 117. Which of the following is true about the melting temperature of potassium chloride?
a. The melting temperature is relatively high.
b. The melting temperature is variable and unpredictable.
c. The melting temperature is relatively low.
d. Potassium chloride does not melt.

____ 118. Under what conditions can potassium bromide conduct electricity?
a. only when melted
b. only when dissolved
c. only when it is in crystal form
d. only when melted or dissolved in water

____ 119. An ionic bond is a bond between ____.
a. a cation and an anion
b. valence electrons and cations
c. the ions of two different metals
d. the ions of two different nonmetals

____ 120. How do atoms achieve noble-gas electron configurations in single covalent bonds?
a. One atom completely loses two electrons to the other atom in the bond.
b. Two atoms share two pairs of electrons.
c. Two atoms share two electrons.
d. Two atoms share one electron.

____ 121. Why do atoms share electrons in covalent bonds?
a. to become ions and attract each other
b. to attain a noble-gas electron configuration
c. to become more polar
d. to increase their atomic numbers

____ 122. Which noble gas has the same electron configuration as the oxygen in a water molecule?
a. helium
b. neon
c. argon
d. xenon

____ 123. Which of the following diatomic molecules is joined by a double covalent bond?
a. O_2
b. Cl_2
c. N_2
d. He_2

____ 124. An ionic compound is held together by what force?
a. electrostatic
b. intermolecular
c. intramolecular
d. electricity

____ 125. Which molecule will make a bent shape?
a. H_2S
b. PCl_3
c. PCl_5
d. SF_6

____ 126. According to VSEPR theory, molecules adjust their shapes to keep which of the following as far apart as possible?
a. pairs of valence electrons
b. inner shell electrons
c. mobile electrons
d. the electrons closest to the nuclei

____ 127. The shape of the methane molecule is called ____.
a. tetrahedral
b. square
c. four-cornered
d. planar

____ 128. What is the shape of HCN?
a. tetrahedral
b. pyramidal
c. bent
d. linear

____ 129. Which of the following covalent bonds is the most polar?
a. H—F
b. H—C
c. H—H
d. H—N

____ 130. What are the weakest attractions between molecules?
a. ionic forces
b. Van der Waals forces
c. covalent forces
d. hydrogen forces

____ 131. The noble gas configuration for Cerium is:
a. [Xe] $6s^2$ $4f^1$ $5d^1$
b. [Xe] $6s^2$ $4f^1$
c. [Rn] $6s^2$ $4f^1$ $5d^1$
d. [Rn] $7s^2$ $5f^1$ $6d^1$

____ 132. Choose the element that corresponds to the orbital diagram below:

a. Iron
b. Chromium
c. Manganese
d. Gallium

____ 133. What is the electron configuration of potassium?

a. $1s^2 2s^2 3s^2 3p^6 3d^1$
c. $1s^2 2s^2 2p^{10} 3s^2 3p^3$
b. $1s^2 2s^2 2p^2 3s^2 3p^2 4s^1$
d. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1$

____ 134. Arrange the following elements: P^{3-}, S^{2-}, K^+, Ca^{2+}, Sc^{3+}, in order of increasing ionic size.

a. K^+, Ca^{2+}, Sc^{3+}, S^{2-}, P^{3-}
c. Sc^{3+}, Ca^{2+}, K^+, P^{3-}, S^{2-}
b. P^{3-}, S^{2-}, K^+, Ca^{2+}, Sc^{3+}
d. Sc^{3+}, Ca^{2+}, K^+, S^{2-}, P^{3-}

____ 135. Arrange the following elements ---Br, As, Kr, Ge, Ca --- in order of increasing ionization energy.

a. Kr, Ca, Ge, As, Br
c. Kr, Br, As, Ge, Ca
b. Br, As, Ge, Ca, Kr
d. Ca, Ge, As, Br, Kr

____ 136. Which ion, Aluminum of Sodium is smaller?

a. Sodium
c. both are the same size
b. Aluminum
d. not enough information

____ 137. $3CuCl_2 + 2Al \longrightarrow 2AlCl_3 + 3Cu$

Choose the correct type of reaction.

a. double replacement
c. combination
b. single replacement
d. decomposition

____ 138. **__ Al + __ $CuSO_4$ → __ $Al_2(SO_4)_3$ + __Cu**

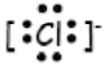
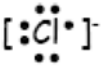
The reaction above can be properly balanced with which set of coefficients listed below?

a. 2, 1, 3, 6
d. 2, 1, 1, 3
b. 4, 3, 2, 6
e. 2, 3, 1, 3
c. 4, 3, 1, 3

____ 139. Which of the following is the shape of C_2H_4?

a. Linear
c. Tetrahedral
b. Bent
d. Trigonal Planar

____ 140. Using the electron dot structure, what would a chlorine atom look like?

a. 
c. 
b. 
d. 

____ 141. What intermolecular force holds together molecules of CO_2?

a. Dispersion
c. Hydrogen Bonding
b. Dipole-Dipole
d. Ionic Bonding

____ 142. What particle is needed to complete the following nuclear equation?

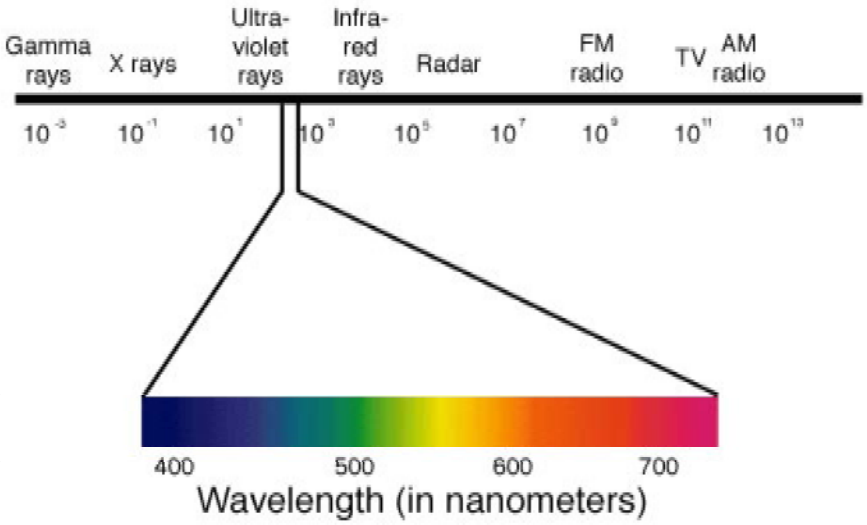
$^{56}_{25}\text{Mn} \rightarrow \text{____} + {}^{0}_{-1}\text{e}$

a. $^{58}_{24}\text{Cr}$
c. $^{56}_{26}\text{Fe}$
b. $^{56}_{27}\text{Co}$
d. $^{27}_{25}\text{Mn}$

____ 143. Of the following transitions in the Bohr hydrogen atom, the _____ transition results in the emission of the highest-energy photon.

a. $n = 6 \rightarrow n = 4$
b. $n = 2 \rightarrow n = 7$
c. $n = 4 \rightarrow n = 6$
d. $n = 1 \rightarrow n = 4$
e. All transitions emit photons of equivalent energy.

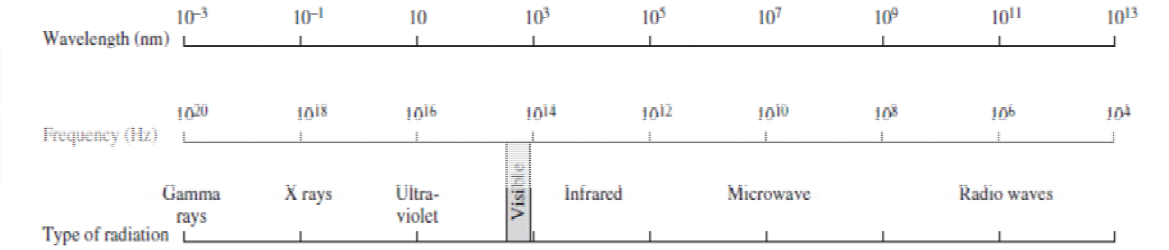
____ 144.



Radio and radar waves are examples of

a. low frequency and long wavelengths
b. high frequency and short wavelengths
c. low frequency and short wavelengths
d. high frequency and long wavelengths

____ 145. Using the figure below, which radiation has the lowest frequency?



a. Gamma rays
b. X rays
c. Ultraviolet
d. Microwave

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

____ 146. Which of the following molecules are nonpolar?
a. $CHCl_3$
b. SCl_2
c. HNO
d. F_2
e. CO_2

____ 147. Which of the following molecules would have a high volatility?
a. NH_3
b. HF
c. CCl_4
d. C_2H_4

____ 148. Which of the following molecules are polar?
a. NH_3
b. HF
c. CCl_4
d. HCOOH

Fall Practice Final Exam
Answer Section

MULTIPLE CHOICE

1. ANS: B PTS: 1 DIF: L1 REF: p. 39
   OBJ: 2.1.1
2. ANS: D PTS: 1 DIF: L1 REF: p. 40
   OBJ: 2.1.2
3. ANS: D PTS: 1 DIF: L2 REF: p. 40
   OBJ: 2.1.2
4. ANS: B PTS: 1 DIF: L1 REF: p. 41
   OBJ: 2.1.3 STA: Ch.2.d
5. ANS: C PTS: 1 DIF: L1 REF: p. 41
   OBJ: 2.1.3
6. ANS: A PTS: 1 DIF: L2 REF: p. 41
   OBJ: 2.1.3 STA: Ch.2.d
7. ANS: C PTS: 1 DIF: L2 REF: p. 42
   OBJ: 2.1.4
8. ANS: D PTS: 1 DIF: L1 REF: p. 45
   OBJ: 2.2.2
9. ANS: D PTS: 1 DIF: L2 REF: p. 46
   OBJ: 2.2.3
10. ANS: D PTS: 1 DIF: L2 REF: p. 48
    OBJ: 2.3.1
11. ANS: A PTS: 1 DIF: L2 REF: p. 54
    OBJ: 2.1.4 | 2.4.1 | 2.4.2
12. ANS: B PTS: 1 DIF: L2 REF: p. 102
    OBJ: 4.1.2
13. ANS: C PTS: 1 DIF: L3 REF: p. 106
    OBJ: 4.2.1 STA: Ch.1
14. ANS: A PTS: 1 DIF: L2 REF: p. 107 | p. 108
    OBJ: 4.2.2 STA: Ch.1.e
15. ANS: D PTS: 1 DIF: L1 REF: p. 111
    OBJ: 4.3.1 STA: Ch.1.a
16. ANS: B PTS: 1 DIF: L1 REF: p. 111
    OBJ: 4.3.1 STA: Ch.1.a | Ch.11.c
17. ANS: B PTS: 1 DIF: L1 REF: p. 110
    OBJ: 4.3.1 STA: Ch.1.a
18. ANS: A PTS: 1 DIF: L1 REF: p. 112 | p. 113
    OBJ: 4.3.1 STA: Ch.11.c
19. ANS: B PTS: 1 DIF: L2 REF: p. 111
    OBJ: 4.3.1 STA: Ch.1.a
20. ANS: C PTS: 1 DIF: L2 REF: p. 112
    OBJ: 4.3.1 STA: Ch.11.c
21. ANS: C PTS: 1 DIF: L3 REF: p. 112 | p. 113
    OBJ: 4.3.1 STA: Ch.11.c

22. ANS: B PTS: 1 DIF: L3 REF: p. 111 | p. 112 | p. 113
OBJ: 4.3.1 | 4.3.2 STA: Ch.11.c
23. ANS: D PTS: 1 DIF: L1 REF: p. 114
OBJ: 4.3.3
24. ANS: B PTS: 1 DIF: L2 REF: p. 115
OBJ: 4.3.3 STA: Ch.1.a
25. ANS: B PTS: 1 DIF: L1 REF: p. 254
OBJ: 9.1.1
26. ANS: C PTS: 1 DIF: L1 REF: p. 254
OBJ: 9.1.1 STA: Ch.3
27. ANS: B PTS: 1 DIF: L2 REF: p. 254
OBJ: 9.1.1 STA: Ch.1.c | Ch.1.d
28. ANS: D PTS: 1 DIF: L2 REF: p. 257
OBJ: 9.1.2 STA: Ch.2
29. ANS: B PTS: 1 DIF: L2 REF: p. 262
OBJ: 9.2.1 STA: Ch.2
30. ANS: A PTS: 1 DIF: L2 REF: p. 262 | p. 263
OBJ: 9.2.1 STA: Ch.2
31. ANS: C PTS: 1 DIF: L2 REF: p. 257 | p. 261 | p. 262
OBJ: 9.2.2 STA: Ch.2
32. ANS: B PTS: 1 DIF: L2 REF: p. 264 | p. 265 | p. 266
OBJ: 9.1.3 | 9.2.2 STA: Ch.2
33. ANS: C PTS: 1 DIF: L2 REF: p. 269
OBJ: 9.3.2 STA: Ch.2
34. ANS: D PTS: 1 DIF: L2 REF: p. 272
OBJ: 9.4.1 STA: Ch.5
35. ANS: B PTS: 1 DIF: L2 REF: p. 272
OBJ: 9.4.2 STA: Ch.5
36. ANS: B PTS: 1 DIF: L2 REF: p. 272
OBJ: 9.4.2 STA: Ch.5
37. ANS: D PTS: 1 DIF: L2 REF: p. 261 | p. 262 | p. 277
OBJ: 9.2.1 | 9.5.2 STA: Ch.5
38. ANS: C PTS: 1 DIF: L3 REF: p. 257 | p. 264
OBJ: 9.2.2 | 9.2.3 | 9.5.2 STA: Ch.5
39. ANS: B PTS: 1 DIF: L2 REF: p. 269 | p. 277
OBJ: 9.3.2 | 9.5.3 STA: Ch.2.b | Ch.5
40. ANS: B PTS: 1 DIF: L1 REF: p. 323
OBJ: 11.1.2 STA: Ch.8.c
41. ANS: D PTS: 1 DIF: L1 REF: p. 324 | p. 325
OBJ: 11.1.3 STA: Ch.3.a | Ch.3.e
42. ANS: C PTS: 1 DIF: L1 REF: p. 325
OBJ: 11.1.3
43. ANS: C PTS: 1 DIF: L2 REF: p. 324 | p. 325
OBJ: 11.1.3 STA: Ch.3.a | Ch.3.e
44. ANS: B PTS: 1 DIF: L1 REF: p. 333
OBJ: 11.2.1
45. ANS: B PTS: 1 DIF: L2 REF: p. 332
OBJ: 11.2.1 STA: Ch.3.a | Ch.3.e

46. ANS: C PTS: 1 DIF: L2 REF: p. 334 | p. 335
OBJ: 11.2.1
47. ANS: A PTS: 1 DIF: L2 REF: p. 336 | p. 337
OBJ: 11.2.1 STA: Ch.3.g
48. ANS: C PTS: 1 DIF: L1 REF: p. 330 | p. 337
OBJ: 11.2.2
49. ANS: A
Exper. ST 1.F

PTS: 1
50. ANS: B
ST 1.A

PTS: 1
51. ANS: A
St. 1.A

PTS: 1
52. ANS: C
ST.1.B

PTS: 1
53. ANS: B
St. 1.E
ST. 1.H

PTS: 1
54. ANS: D
St. 11.A

PTS: 1
55. ANS: A
ST11.D

PTS: 1
56. ANS: A PTS: 1
57. ANS: C
ST. 1.A

PTS: 1
58. ANS: C
Experiment 1.f

PTS: 1
59. ANS: C
ST. 1.b

PTS: 1

60. ANS: C
ST. 1E, 1H

PTS: 1
61. ANS: C
ST 1B

PTS: 1
62. ANS: A
ST 2A, 2B

PTS: 1
63. ANS: A
St 2A

PTS: 1
64. ANS: A
ST 2B

PTS: 1
65. ANS: C
EXP 1
ST1A

PTS: 1

66. ANS: B PTS: 1 DIF: 2 STA: 2a
KEY: Ionic Compound Recognition
67. ANS: C PTS: 1 DIF: 2 STA: 2a
TOP: Acid Identification
68. ANS: B PTS: 1
69. ANS: B PTS: 1 DIF: L2 REF: p. 131
OBJ: 5.1.3 STA: Ch.1.i
70. ANS: D PTS: 1 DIF: L2 REF: p. 131 | p. 132
OBJ: 5.1.3 STA: Ch.1.i
71. ANS: B PTS: 1 DIF: L2 REF: p. 131
OBJ: 5.1.4 STA: Ch.1.i
72. ANS: C PTS: 1 DIF: L1 REF: p. 134
OBJ: 5.2.1 STA: Ch.1.i
73. ANS: C PTS: 1 DIF: L2 REF: p. 131
OBJ: 5.2.1 STA: Ch.1.i
74. ANS: D PTS: 1 DIF: L2 REF: p. 133
OBJ: 5.2.1 STA: Ch.1.i
75. ANS: C PTS: 1 DIF: L2 REF: p. 134 | p. 135
OBJ: 5.2.1 STA: Ch.1.g
76. ANS: A PTS: 1 DIF: L3 REF: p. 133 | p. 134
OBJ: 5.2.1 STA: Ch.1.g
77. ANS: A PTS: 1 DIF: L1 REF: p. 136
OBJ: 5.2.2 STA: Ch.1.g

78. ANS: A PTS: 1 DIF: L3 REF: p. 133 | p. 134 | p. 135 | p. 136
OBJ: 5.2.2 STA: Ch.1.i
79. ANS: C PTS: 1 DIF: L2 REF: p. 139
OBJ: 5.3.1 STA: Ch.11.e
80. ANS: D PTS: 1 DIF: L2 REF: p. 139
OBJ: 5.3.1 STA: Ch.1.j
81. ANS: D PTS: 1 DIF: L2 REF: p. 139
OBJ: 5.3.1 STA: Ch.1.j
82. ANS: B PTS: 1 DIF: L2 REF: p. 141
OBJ: 5.3.2 STA: Ch.1.j
83. ANS: D PTS: 1 DIF: L1 REF: p. 144
OBJ: 5.3.4 STA: Ch.1.j
84. ANS: B PTS: 1 DIF: L1 REF: p. 130
OBJ: 5.3.4 STA: Ch.1.i
85. ANS: B PTS: 1 DIF: L1 REF: p. 162 | p. 163
OBJ: 6.1.1 STA: Ch.1.b
86. ANS: A PTS: 1 DIF: L2 REF: p. 157
OBJ: 6.1.1 STA: Ch.1.a
87. ANS: C PTS: 1 DIF: L2 REF: p. 157
OBJ: 6.1.1 STA: Ch.1.a
88. ANS: D PTS: 1 DIF: L2 REF: p. 158
OBJ: 6.1.3 STA: Ch.1.b
89. ANS: C PTS: 1 DIF: L3 REF: p. 160
OBJ: 6.1.3 STA: Ch.1.b
90. ANS: A PTS: 1 DIF: L2 REF: p. 164
OBJ: 6.2.2 STA: Ch.1.g
91. ANS: A PTS: 1 DIF: L2 REF: p. 166
OBJ: 6.2.2 STA: Ch.1.b
92. ANS: B PTS: 1 DIF: L2 REF: p. 164
OBJ: 6.2.2 STA: Ch.1.g
93. ANS: C PTS: 1 DIF: L1 REF: p. 164 | p. 166
OBJ: 6.2.3 STA: Ch.1.a
94. ANS: B PTS: 1 DIF: L2 REF: p. 164
OBJ: 6.2.2 | 6.2.3 STA: Ch.1.a
95. ANS: B PTS: 1 DIF: L2 REF: p. 171
OBJ: 6.3.1 STA: Ch.1.a
96. ANS: B PTS: 1 DIF: L2 REF: p. 172
OBJ: 6.3.2 STA: Ch.1.c
97. ANS: B PTS: 1 DIF: L3 REF: p. 162 | p. 163 | p. 172
OBJ: 6.3.2 STA: Ch.1.c
98. ANS: C PTS: 1 DIF: L2 REF: p. 173
OBJ: 6.3.3 STA: Ch.1.c
99. ANS: A PTS: 1 DIF: L2 REF: p. 177
OBJ: 6.3.3 STA: Ch.1.c
100. ANS: D PTS: 1 DIF: L2 REF: p. 177
OBJ: 6.3.3 STA: Ch.1.c
101. ANS: B PTS: 1 DIF: L2 REF: p. 177 | p. 178
OBJ: 6.3.3 STA: Ch.1.c

102. ANS: A PTS: 1 DIF: L2 REF: p. 172 | p. 176
OBJ: 6.3.3 STA: Ch.1.c
103. ANS: C PTS: 1 DIF: L3 REF: p. 174
OBJ: 6.3.3 STA: Ch.1.c
104. ANS: A PTS: 1 DIF: L1 REF: p. 188
OBJ: 7.1.1 STA: Ch.1.c | Ch.2.a | Ch.1.d
105. ANS: B PTS: 1 DIF: L1 REF: p. 188
OBJ: 7.1.1 STA: Ch.1.c | Ch.2.a
106. ANS: A PTS: 1 DIF: L2 REF: p. 188 | p. 189
OBJ: 7.1.1 STA: Ch.1.g
107. ANS: A PTS: 1 DIF: L2 REF: p. 188
OBJ: 7.1.2 STA: Ch.2.a
108. ANS: B PTS: 1 DIF: L1 REF: p. 190
OBJ: 7.1.3 STA: Ch.1.c | Ch.2.a | Ch.1.d
109. ANS: B PTS: 1 DIF: L1 REF: p. 190
OBJ: 7.1.3 STA: Ch.3.a
110. ANS: A PTS: 1 DIF: L1 REF: p. 190
OBJ: 7.1.3 STA: Ch.1.g
111. ANS: B PTS: 1 DIF: L1 REF: p. 192
OBJ: 7.1.4 STA: Ch.1.g
112. ANS: D PTS: 1 DIF: L1 REF: p. 194
OBJ: 7.2.1 STA: Ch.2.a
113. ANS: A PTS: 1 DIF: L2 REF: p. 194
OBJ: 7.2.1 STA: Ch.2.a
114. ANS: C PTS: 1 DIF: L2 REF: p. 194
OBJ: 7.2.1 STA: Ch.2.a
115. ANS: C PTS: 1 DIF: L2 REF: p. 195
OBJ: 7.2.1 STA: Ch.3.a
116. ANS: A PTS: 1 DIF: L1 REF: p. 196
OBJ: 7.2.2 STA: Ch.2.a
117. ANS: A PTS: 1 DIF: L1 REF: p. 196
OBJ: 7.2.2 STA: Ch.5.a
118. ANS: D PTS: 1 DIF: L1 REF: p. 198
OBJ: 7.2.2 STA: Ch.5.a
119. ANS: A PTS: 1 DIF: L1 REF: p. 201
OBJ: 7.2.1 | 7.3.1 STA: Ch.2.a
120. ANS: C PTS: 1 DIF: L2 REF: p. 217
OBJ: 8.2.1 STA: Ch.2.a
121. ANS: B PTS: 1 DIF: L2 REF: p. 217
OBJ: 8.2.1 STA: Ch.2.a
122. ANS: B PTS: 1 DIF: L2 REF: p. 218
OBJ: 8.2.1 STA: Ch.1.g
123. ANS: A PTS: 1 DIF: L2 REF: p. 221
OBJ: 8.2.3 STA: Ch.2.a
124. ANS: A PTS: 1 DIF: L2 REF: p. 223
OBJ: 8.2.4 STA: Ch.2.a
125. ANS: A PTS: 1 DIF: L2 REF: p. 229
OBJ: 8.2.7 STA: Ch.2.a

126. ANS: A PTS: 1 DIF: L1 REF: p. 232
OBJ: 8.3.2 STA: Ch.2.a
127. ANS: A PTS: 1 DIF: L1 REF: p. 232
OBJ: 8.3.2 STA: Ch.2.a
128. ANS: D PTS: 1 DIF: L2 REF: p. 235
OBJ: 8.3.3 STA: Ch.2.a
129. ANS: A PTS: 1 DIF: L3 REF: p. 238 | p. 239
OBJ: 8.4.1 STA: Ch.2.a
130. ANS: B PTS: 1 DIF: L1 REF: p. 240
OBJ: 8.4.3 STA: Ch.2.a | Ch.2.h
131. ANS: A PTS: 1
132. ANS: A PTS: 1
133. ANS: D PTS: 1 DIF: L2 REF: p. 133 | p. 134 | p. 135
OBJ: 5.2.1 STA: Ch.1.g
134. ANS: D PTS: 1
135. ANS: D PTS: 1
136. ANS: B PTS: 1
137. ANS: B PTS: 1 STA: 3e
138. ANS: E PTS: 1
139. ANS: D PTS: 1
140. ANS: A PTS: 1
141. ANS: A PTS: 1
142. ANS: C PTS: 1 DIF: L3 REF: p. 803 | p. 804
OBJ: 25.2.1 STA: Ch.11.d
143. ANS: A PTS: 1 DIF: 1 REF: Page Ref: 6.3
OBJ: 6.3; G2
144. ANS: A PTS: 1
145. ANS: D PTS: 1 DIF: Medium REF: Section: 7.1
OBJ: EK.1.D.3

MULTIPLE RESPONSE

146. ANS: D, E PTS: 1
147. ANS: C, D PTS: 1
148. ANS: A, B PTS: 1