(1) The key to success in chemistry is: (1 points)
A) curiosity.
B) mathematical skills.
C) commitment.
D) practice.
E) all of the above

(2) Which of the following would be considered a theory? (1 points)
A) Glass is fragile.
B) Hot air rises.
C) Gasoline has a very strong odor.
D) Helium balloons float because helium is less dense than air.

(3) What is the volume of 12.8 g of a liquid that has a density of 0.789 g/mL? (1 points)
A) 12.8 mL
B) 16.2 mL
C) 10.7 mL
D) 13.6 mL
E) none of the above

(4) How many inches are in 6.32 cm? (1 points)
A) 16.1
B) 2.49
C) 3.78
D) 8.86
E) none of the above

(5) The distance between the two hydrogen atoms in a molecule of water is 0.000000000172 m. Express this distance in scientific notation. (1 points)
A) 1.72×10^{-9} m
B) 1.72×10^{-10} m
C) 0.172×10^{-10} m
D) 17.2×10^{9} m
E) 1.72×10^{10} m

(6) Suppose a thermometer has marks at every one degree increment and the mercury level on the thermometer is exactly between the 25 and 26 degree Celsius marks. We should properly report the temperature measurement as (1 points)
A) 25°C
B) 26°C
C) 25.5°C
D) 25.50°C
E) 25.55°C

(7) How many significant digits should be reported in the answer to the following calculation? (1 points)

$$\frac{(12.348)(24.02587)}{(2.758)} =$$

A) 3
B) 4
C) 2
D) 5
E) none of the above

(8) How much heat (kJ) is absorbed by 948.0 g of water in order for the temperature to increase from 25.00°C to 32.50°C? (1 points)
A) 7.5
B) 31.4
C) 30.2
D) 29.7
E) none of the above

(9) Which state of matter has atomic spacing that is close together and indefinite shape? (1 points)
A) liquid
B) solid
C) gas
D) plasma
E) none of the above

(10) Which state of matter has atomic spacing that is far apart and definite shape? (1 points)
A) liquid
B) solid
C) gas
D) plasma
E) none of the above

(11) Melting point can be defined as the temperature when a solid becomes a liquid. The melting point of the chemical *acetone* is -95°C. Which state of matter would you expect to exist for acetone at a temperature of -94°C? (1 points)
A) solid
B) liquid
C) gas
D) plasma

(12) When methane is burned with oxygen, the products are carbon dioxide and water. If you produce 9 grams of water and 11 grams of carbon dioxide from 16 grams of oxygen, how

many grams of methane were needed for the reaction? (1 points)
A) 4
B) 20
C) 31
D) 40
E) none of the above

(13) If you hold a solid piece of pure gallium metal in your hand, your body heat will melt the gallium into its liquid form. This illustrates which of the following? (1 points)
A) distillation
B) physical change
C) chemical change
D) chemical property
E) none of the above

(14) Which of the following elements has an atomic number of 4? (1 points)
A) H
B) C
C) He
D) Be

(15) What is the atomic symbol for silver? (1 points)
A) S
B) Ag
C) Au
D) Si

(16) Metals are located where on the periodic table? (1 points)
A) left side
B) right side
C) middle
D) zig-zag diagonal line
E) none of the above

(17) Metalloids are located where on the periodic table? (1 points)
A) left side
B) right side
C) middle
D) zig-zag diagonal line
E) none of the above

(18) How many neutrons are found in C-14? (1 points)
A) 8
B) 14
C) 6
D) 0
E) none of the above

(19) A specific isotope of an element is known to have 15 protons and 16 neutrons. Which symbol would properly represent this isotope? (1 points)
A) $^{15}_{31}\mathrm{Ga}$
B) $^{31}_{15}\mathrm{P}$
C) $^{16}_{15}\mathrm{X}$
D) $^{31}_{16}\mathrm{S}$
E) none of the above

(20) How many of each type of atom are there in the formula $Ca_3(PO_4)_2$? (1 points)
A) Ca = 3, P = 1, O = 4
B) Ca = 3, P = 2, O = 4
C) Ca = 3, P = 2, O = 8
D) Ca = 3, P = 1, O = 8

(21) A certain oxyacid is derived from the oxyanion SO_3^{2-}. The formula for the oxyacid is (1 points)
A) H_2SO_4.
B) HSO_3.
C) H_2SO_3.
D) H_3SO_3.
E) none of the above

(22) What would the formula of diiodine heptasulfide be? (1 points)
A) I_5S_2
B) I_2S_5
C) I_4S_9
D) I_2S_7
E) none of the above

(23) What is the proper name for HBr *(aq)*? (1 points)
A) hydrobromous acid
B) hydrousbromic acid
C) hydrobromic acid
D) bromous acid
E) none of the above

(24) Carbon is considered which of the following? (1 points)
A) atomic element
B) molecular element
C) molecular compound
D) ionic compound
E) none of the above

(25) What is the correct value for Avogadro's number? (1 points)
A) 6.022×10^{23}
B) 6.022×10^{33}
C) 6.023×10^{22}
D) $6.022 \times 10^{2.3}$
E) none of the above

(26) How many atoms are in 5.80 moles of He? (1 points)
A) 6.02×10^{23}
B) 1.03×10^{23}
C) 4.00
D) 3.49×10^{24}
E) none of the above

(27) One mole of boron has a mass of _____ g. (1 points)
A) 9.012
B) 6.022×10^{23}
C) 5
D) 10.811
E) none of the above

(28) How many moles of Cu are in 1.48×10^{25} Cu atoms? (1 points)
A) 0.0408
B) 24.6
C) 1.54×10^{25}
D) 6.022×10^{23}
E) none of the above

(29) How many molecules of sulfur trioxide are in 78.0 grams? (1 points)
A) 5.87×10^{23}
B) 7.33×10^{23}
C) 3.76×10^{27}
D) 0.974
E) none of the above

(30) What is the molar mass of aluminum sulfate? (1 points)
A) 123.0 g/mol
B) 278.0 g/mol
C) 306.2 g/mol
D) 315.2 g/mol
E) 342.2 g/mol

(31) How many moles of fluorine are in 3.2 moles of xenon hexafluoride? (1 points)
A) 22.4
B) 12.8
C) 19.2
D) 16
E) none of the above

(32) In comparing a balloon containing 25 grams of helium to a balloon containing 25 grams of neon, which one of the following statements is TRUE? (1 points)
A) Each balloon has an equal number of atoms.
B) The helium balloon has more atoms.
C) The neon balloon has more atoms.
D) This scenario cannot happen because gases have no mass.
E) none of the above

(33) Calculate the molar mass of calcium nitrate [$Ca(NO_3)_2$]. (2 points)

(34) An unknown acid has a molar mass of 60.05 g/mol. Given the following percent composition, what is the molecular formula? (4 Points)

Element	Percent Natural Abundance
Carbon	54.53%
Hydrogen	9.15%
Oxygen	36.32%

(29) What was your favorite part of this course? What was the worst part? What would you do to make it better? (3 points Extra Credit)