

- (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 multiplier 0.1 is represented by which prefix? (1 points)
A) kilo-
B) deci-
C) centi-
D) milli-
E) none of the above
- (6) 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

(7) 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

(8) 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

(9) 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

(10) 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

(11) What is the charge on a lithium atom that contains 2 e⁻? (1 points)

- A) 2+
- B) 3+
- C) 1-
- D) 1+
- E) none of the above

(12) How many neutrons are found in C-14? (1 points)

- A) 8
- B) 14
- C) 6
- D) 0
- E) none of the above

(13) 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) $^{15}_{31}\text{Ga}$
- B) $^{31}_{15}\text{P}$
- C) $^{16}_{15}\text{X}$
- D) $^{31}_{16}\text{S}$
- E) none of the above

(14) How many C atoms are in ammonium acetate [$\text{NH}_4\text{CH}_3\text{CO}_2$]? (1 points)

- A) 5
- B) 2
- C) 1
- D) 3
- E) none of the above

(15) 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

(16) 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

(17) What is the proper name for $\text{HBr}(aq)$? (1 points)

- A) hydrobromous acid
- B) hydrousbromic acid
- C) hydrobromic acid
- D) bromous acid
- E) none of the above

(18) How many moles are there in 82.5 grams of iron? (1 points)

- A) 4.97×10^{25}
- B) 55.85
- C) 0.677
- D) 1.48
- E) none of the above

(19) What is the mass in grams of 5.40 moles of lithium? (1 points)

- A) 6.94
- B) 37.5
- C) 1.29
- D) 3.25×10^{24}
- E) none of the above

(20) 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

(21) 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

(22) One mole of $(\text{NH}_4)_2\text{HPO}_4$ contains how many moles of hydrogen atoms? (1 points)

- A) 4
- B) 2
- C) 8
- D) 9
- E) none of the above

(23) 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

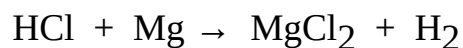
(24) A reaction which forms a solid product is an example of a(n)_____.

- A) oxidation-reduction reaction (1 points)
- B) combustion reaction
- C) precipitation reaction
- D) gas evolution reaction
- E) none of the above

(25) A reaction in which a substance reacts with oxygen, emitting heat and forming oxygen-containing compounds is an example of a(n) (1 points)

- A) acid-base reaction.
- B) combustion reaction.
- C) precipitation reaction.
- D) gas evolution reaction.
- E) none of the above

(26) Balance the following reaction by including the proper coefficients? (3 points)



(2) 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	40.0%
Hydrogen	6.70%
Oxygen	53.3%

(27) 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)