CHEMISTRY PRACTICE TEST 1: UNITS 1, 2, 3

$$D = \frac{m}{V}$$

$^{o}F = (^{o}C \times 1.8) + 32$

$$^{o}C = \frac{^{o}F - 32}{1.8}$$

$K = ^{o}C + 273.15$

Unit 1

1. What is the definition of Matter?
   a. anything that has texture and occupies space
   b. anything that has mass and occupies space.
   c. anything that has color and occupies space.
   d. Anything that has a smell and occupies space.
   e. Anything that releases a gas.

2. Clean Air is a(n) _____.
   a. element
   b. compound
   c. solution
   d. heterogeneous mixture
   e. energy

3. Solid silicon dioxide is a(n) _____.
   a. element
   b. compound
   c. solution
   d. heterogeneous mixture
   e. energy

4. Aluminum is a(n) _____.
   a. element
   b. compound
   c. solution
   d. heterogeneous mixture
   e. energy

5. How many atoms of carbon are there in acetic acid (CH_3COOH)?
   a. 1
   b. 2
   c. 3
   d. 4
   e. 5

6. Which of the following is not one of Aristotle's Four-Element Theory?
   a. Wind
   b. Fire
   c. Earth
   d. Air
   e. Water

7. Opening a bottle of pop involves a _____ change.
   a. physical
   b. chemical

8. Melting iron involves a _____ change.
   a. physical
   b. chemical

9. What is the chemical symbol for iron?
   a. Fe
   b. I
   c. Id
   d. Ir
   e. Pt

10. When magnesium burns, a white powder is produced. Name the Theory proposed by Becher and Stahl in the late 1600's that incorrectly explained the behavior of burning materials. This theory was later disproved by the discovery of oxygen.
    a. Law of Conservation of Mass
    b. Atomic Theory
    c. Avicenna's Theory
    d. Phlogiston Theory
    e. Antimony Theory

11. The state of matter that has an indefinite volume and indefinite shape is called _____.
    a. solid
    b. liquid
    c. gas
    d. ice
    e. aqueous

12. Compounds can be separated into their respective elements by physical methods.
    a. True
    b. false

13. Electrolysis of water (water separated into the diatomics H_2 and O_2) is an example of a _____ change.
    a. Physical
    b. Color
    c. chemical
    d. phase
    e. temperature

14. A homogeneous mixture _____.
    a. has different types of particles and its composition is the same throughout
    b. has different types of particles and its composition is different in different regions
    c. has only one type of particle
    d. has only one type of element

15. The early chemists (referred to as alchemists) tried to create gold from other metals in the hopes of achieving wealth and eternal life. This work is referred to as _____.
    a. Aristotle's Four-Element Theory
    b. Avicenna's Pharmacy
    c. The Philosopher's Stone
    d. The discovery of elements
    e. Phlogiston

16. A bottle indicating 3% hydrogen peroxide would be classified as a(n) _____.
    a. element
    b. compound
    c. solution
    d. heterogeneous mixture
    e. energy

17. ____ is the energy associated with motion.
    a. Kinetic
    b. Potential

18. When polystyrene dissolves in acetone, it undergoes a _____ change.
    a. chemical
    b. physical
    c. phase
    d. state
    e. temperature

19. Which of the following is not a naturally occurring diatomic?
    a. Ba_2
    b. O_2
    c. N_2
    d. F_2
    e. Br_2

20. Classify peanut M&M© candies.
    a. homogeneous / solution
    b. homogeneous / compound
    c. heterogeneous / compound
    d. homogeneous / mixture
    e. heterogeneous / mixture

Unit 2

21. Represent the following number in scientific notation: 0.00325.
    a. 3.25×10^{-2}
    b. 3.25×10^{-3}
    c. 3.25×10^{3}
    d. 32.5×10^{-3}
    e. 325×10^{0}

22. Represent the number 10256000 in standard scientific notation.
    a. 1.0256 x 10^{7}
    b. 1.0256 x 10^{-7}
    c. 1.0256 x 10^{-6}
    d. 1.0256 x 10^{3}
    e. 1.0256 x 10^{-3}

23. How many significant figures are in 7.21 x 10^{-4} ?
    a. 1
    b. 2
    c. 3
    d. .4
    e. 5

24. The standard (SI) unit of length is the _____.
    a. foot
    b. inch
    c. centimeter
    d. yard
    e. meter

25. What is the answer to the following (with proper significant figures)?
    33.001 + 0.01 + 30
    a. 63.010
    b. 63.01
    c. 63.0
    d. 63
    e. 60

26. How many decimeters are in 1 meter?
    a. 10
    b. 0.1
    c. 100
    d. 0.001
    e. 1000

27. Convert 15L to cL
    a. 15000 cL
    b. 1500 cL
    c. 150 cL
    d. 1.5 cL
    e. 0.15 cL

28. Determine the number of significant figures in the number 0.0250015
    a. 6
    b. 2
    c. 4
    d. 7
    e. 8

29. Round the number 14.449 to three significant digits.
    a. 14.5
    b. 14.4
    c. 14.0
    d. 14.400
    e. 15.0

30. In theory, is it possible to have a negative Kelvin temperature?
    a. Yes
    b. No

31. Convert -151ºC to fahrenheit.
    a. 304ºC
    b. -304ºC
    c. 272ºC
    d. -240.ºC
    e. 0ºC

32. Determine the density of a new material if 2.81 grams displace a 0.56 mL volume of water.
    a. 14.10 g/mL
    b. 5.02 g/cm^3
    c. 0.20 g/mL
    d. 25.2 g/cm^3

33. What is the volume of 150. grams of having a density 13.6 g/mL.
    a. 110. mL
    b. 11.0 mL
    c. 2040 mL
    d. 150. mL
    e. 0.0907 mL

34. Helium liquefies at 4.4 K, or _____ ^{O}C.
    a. $4.4^{O}C$
    b. $-269^{O}C$
    c. $-268.8^{O}C$
    d. $-258.16^{O}C$
    e. $277.16^{O}C$

35. 25 liters is how many deciliters?
    a. 2.5 dL
    b. 250 dL
    c. 0.40 dL
    d. 0.0040 dL
    e. 0.25 dL

36. 3.3 micrograms is how many grams?
    a. 3.3×10^{3} g
    b. 3.3×10^{6} g
    c. 3.3×10^{-3} g
    d. 3.3×10^{-5} g
    e. 3.3×10^{-6} g

37. 44 cm is how many km?
    a. 0.00044 km
    b. 0.044 km
    c. 44,000 km
    d. 4,400,000 km
    e. 44 km

38. 0.90 mg is how many ng?
    a. 0.000009 ng
    b. 0.009 ng
    c. 90,000 ng
    d. 900,000 ng
    e. 9,000,000,000 ng

39. List these distance units in order from ***smallest*** to ***largest***:
    a. μm, nm, dm, m, km
    b. μm, nm, m, km, dm
    c. km, m, mm, μm, nm
    d. km, m, mm, nm, μm
    e. nm, μm, mm, m, km

40. 25 meters is how many kilometers?
    a. 0.25 km
    b. 0.025 km
    c. 2,500 km
    d. 25,000 km
    e. 0.0025 km

Unit 3

41. A +2 ion of barium has _____ protons and _____ electrons.
    a. 56, 56
    b. 56, 58
    c. 58, 56
    d. 56, 54
    e. 54, 56

42. The symbol ^{14}C means an isotope of carbon with _____ protons and _____ neutrons.
    a. 6, 14
    b. 6, 8
    c. 14, 6
    d. 8, 6
    e. 14, 8

43. Who suggested that cathode rays are streams of electrons?
    a. J. J. Thomson
    b. Ernest Rutherford
    c. John Dalton
    d. James Chadwick
    e. Dmitri Mendeleev

44. Who is famous for saying: atoms exist and combine in small, whole number ratios?
    a. J. J. Thomson
    b. John Dalton
    c. Dmitri Mendeleev
    d. Ernest Rutherford
    e. James Chadwick

45. Who did the Oil Drop experiment to determine the charge value of the electron?
    a. J.J. Thomson
    b. James Chadwick
    c. Robert Millikan
    d. Ernest Rutherford
    e. John Dalton

46. The total number of subatomic particles in $^{37}_{17}Cl$ is:
    a. 54
    b. 20
    c. 17
    d. 18
    e. 37

47. Given the following isotopes: $^{38}Cl^-$, fill in the blanks with the correct answer.
    1. ____ protons ____ neutrons ____ electrons
    b. 38, 17, 39
    c. 17, 38, 18
    d. 17, 21, 16
    e. 17, 21, 18

48. An element X was analyzed by mass spectrometry and found to have two isotopes with the following information: Calculate the average atomic mass of element X.

Isotope	Isotopic mass (amu)	Abundance
^{63}X	62.930	69.09%
^{65}X	64.928	30.91%

    a. 64.00 amu
    b. 62.93 amu
    c. 63.55 amu
    d. 63.60 amu

49. Which of the following is a noble gas?
    a. O
    b. N
    c. B
    d. Li
    e. Ne

50. Which of the following is an alkali metal?
    a. O
    b. N
    c. B
    d. Li
    e. Ne