Review- Chapter 1 and 2

1. A certain liquid has a density of 2.67 g/cm^3. 134.0 g of this liquid would occupy a volume of _____ m L.

A) 1.99 X 10^{-3}
(B) 50.2
C) 3.58
D) 35.8
E) 0.502

$D = \frac{m}{V}$ $V = \frac{m}{D}$ $\frac{134.0\,g}{2.67\,cm^3} = 50.2\,g/cm^3$

2. The correct result of the molecular mass calculation for H_2SO_4 is _____.

$(4 \times 15.9994) + 32.066 + (2 \times 1.0079) =$

A) 98.08
(B) 98.079
C) 98.074
D) 98.838
E) 98.84

exact number / measured number

63, 9976 + 32.066 + 2. 0158 = 98.0794

3 decimals

3. A small amount of salt dissolved in water is an example of a _____.

(A) homogeneous mixture same as solution
B) heterogeneous mixture
C) compound
D) pure substance
E) solid

4. Aluminum reacts with a certain nonmetallic element to form a compound with the general formula AlX. Element X is a diatomic gas at room temperature. Element X must be _____.

A) oxygen
B) fluorine
C) chlorine
(D) nitrogen
E) sulfur

H, O, F, Br, I, N, Cl

neutral

Al^{+3} X must be -3

5. Which pair of elements would you expect to exhibit the greatest similarity in their physical and chemical properties?

A) H, Li
B) Cs, Ba
(C) Ca, Sr Same group
D) Ga, Ge
E) C, O

6.	Mass of an empty container	3.0 grams
	Mass of the container plus the solid sample	25.0 grams
	Volume of the solid sample	11.0 cm^3

Mass sample = 25.0g − 3.0g = 22.0g

3 S.F

$D = \frac{22.0\,g}{11.0\,cm^3} = 2.00\,g/cm^3$

The data above were gathered in order to determine the density of an unknown solid. The density of the sample should be reported as

(A) 0.5 g/cm^3 (B) 0.50 g/cm^3 (E) 2.27 g/cm^3
(C) 2.0 g/cm^3 (D) 2.00 g/cm^3

7. An student determines the density of an unknown solid to be 15.79 g/ml. The accepted value is 18.85 g/ml. What is the student's percent error?

Define precision and give an example.
Define accuracy and give an example.

% error = $\frac{experimental - actual}{actual} \times 100$

precision = clustered results
accuracy = close to target
Example - 4 tails hit donkey on ear precise
1 tail hit donkey on hindquarter accurate

Read the following statements. Choose which of these words best describes each statement:

a. Mixtures in general
b. Solutions
c. Heterogeneous Mixtures
d. Substances
e. Elements
f. Compounds

F 8. Made of two or more elements which are chemically combined

E 9. Pure metals such as iron, copper, silver and nickel are in this category

b 10. A homogeneous mixture where the components are completely uniform throughout

a 11. Components making this up keep their identifying properties

E 12. Cannot be broken down into simpler substances by ordinary chemical means

A 13. Can be separated by simple physical means like distillation, filtration, etc.

C 14. Examples include the following mixed together: oil and vinegar, salt and pepper, soil

D 15. All samples of this have identical properties like boiling point, color, and density which can help identify it.

c 16. Is not uniform in composition. It has two or more phases.

	Isotope	Isotope Notation	Atomic #	Protons	Electrons	Neutrons
17.	Oxygen-16	$^{16}_{8}O$	8	8	8	8
18.	Bromine-80	$^{80}_{35}Br$	35	35	35	45
19.	Uranium-235	$^{235}_{92}U$	92	92	92	143
20.	Copper-64	$^{64}_{29}Cu$	29	29	29	35

21. If you wanted to separate iron filings from sand, you would use a _____.

A: funnel
B: filter
(C): magnet

22. The process used to separate heterogeneous mixtures of solids and liquids is called _____.

(A) filtration
B: crystallization/ evaporation
C: distillation
D: chromatography

23. _____ is a separation technique that uses the boiling points of various substances to separate mixtures.

A: filtration
B: crystallization/evaporation
(C): distillation
D: chromatography

$9.36 \div 2 = 4.68$
$9.36 \div 3 = 3.12$
$9.36 \div 4 = 2.34$
$9.36 \div 5 = 1.87$

24. A compound containing only carbon and hydrogen has a carbon-to hydrogen mass ratio of 9.36. Which carbon-to-hydrogen ratio is possible for another compound composed only of carbon and hydrogen?

A. 11.89 (B.) 3.12 C. 4.56 D. 7.13 E. 2.45

whole number multiple of ratio

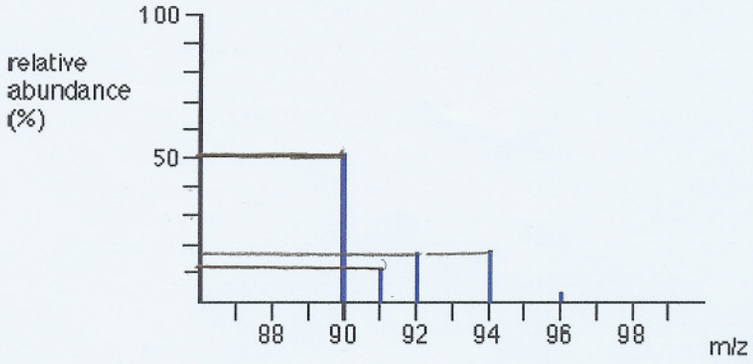
25. 18K gold has a density of 14.9g/cm^3. If a piece of gold foil has a mass of 250g and a thickness of 1.58 cm, what is the area of the gold?

$\frac{14.9\ g}{cm^3} = \frac{250g}{Vol}$ $V = 16.8\ cm^3$ $V = L \cdot w \cdot h$ $16.8 = A(1.58)$ $V = A \cdot h$ $A = 10.6\ cm^2$

26. Convert 268.8 ounces to milligrams. (1 lb = 16 ounces, 1 lb = 453.6 grams)

$Hg = 268.8\ oz \times \frac{1\ lb}{16\ oz} \times \frac{453.6\ g}{1\ lb} \times \frac{1000\ mg}{1\ g} = 7.620 \times 10^6\ mg$

27. What is the average atomic mass of Niobium, based on this mass spectrometer results?



4 isotopes

	% abundance		
90	50%	=	45
91	12%	=	10.9
92	18%	=	16.6
94	19%	=	17.9
96	1%	=	1.0

91.4 amu