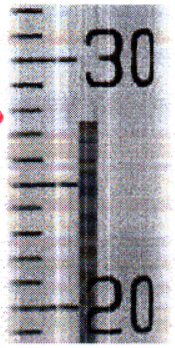
Exam 1 Practice – Chem& 161 – K. Marr **Answer Key**

Matter and Measurement

1. How many significant digits are present in the temperature read from the thermometer illustrated to the right?



28 27 27.5°

a) 1 b) 2 c) 3 d) 4

2. The dimensions of a rectangular solid are 8.00 cm long, 4.00 cm wide, and 2.00 cm high. If the density of the solid is 10.0 g/cm^3, what is its mass? Vol = L x W x H = 64.0 cm3

a) 10/64 grams
b) 10.0 grams
c) 64.0 grams
d) 320 grams
e) 640 grams (5 sig figs?)

64.0 cm^3 x $\frac{10.0\ g}{cm^3}$ = 640. g

3. A metal sample weighing 30.9232 grams was added to a graduated cylinder containing 23.26 mL of water. The volume of water plus the sample was 24.85 mL. Which setup will result in the density of this metal?

a) 30.9232 x (24.85-23.26)

b) $\frac{30.9232}{24.85 - 23.26}$

c) $\frac{24.85 - 23.26}{30.9232}$

d) 30.9232 x $\frac{24.85}{23.26}$

e) $\frac{30.9232}{24.85 + 23.26}$

Vol = 24.85 − 23.26 = 1.59

D = $\frac{m}{V}$ = $\frac{30.9232}{(24.85 - 23.26)}$

4. The number of significant digits in 0.30500 is

a) 1 d) 4
b) 2 e) 5
c) 3

5. A box measures 3.50 cm x 2.915 cm. The product of these numbers = 10.2025 cm^2. What is the proper way to report the area of the box? 3 S.F.

a) 10.20 cm^2 c) 10 cm^2
b) 10.2 cm^2 d) 10. cm^2

6. The result of 2.350 x (4.0 + 6.311) is,

4 SF 3 SF

$$\begin{array}{r} 6.311 \\ +\ 4.0 \\ \hline 10.311 \end{array}$$

3 S.F.

a) 24 c) 24.21
b) 24.2 d) 24.205

BE CAREFUL WHEN + or − WITH SIG. FIGS.

7. A student does a calculation using her calculator and the number 280.27163 is shown on the display. If there are actually three significant figures, how should she show the final answer?

a) 280 2 SF
b) 280.3 4 SF
c) 280.27 5 SF
d) 2.80 x 10^{-2} = .0280
e) 2.80 x 10^2

or 280. would be 3 S.F.

8. The term that refers to the reproducibility of a laboratory measurement is

a) precision c) accuracy
b) repeatability d) exactness

9. Which measurement below is NOT written with three significant digits?

a) 2.00 cm
b) 550. grams
c) 0.003 L 1 S.F.
d) 12.7 mm

6.33 x 100

10. The number 6.33 x 10^2 equals,
    a) 6.33
    b) 0.633
    c) 633
    d) 0.0633

11. All the following are characteristic properties of phosphorus. Which one is a chemical property?
    a) Both red phosphorus and white phosphorus exist in solid allotropic forms.
    b) The red form melts at about 600°C and the white form melts at 44°C.
    c) The white form is soluble in liquid carbon disulfide, but is insoluble in water.
    d) When exposed to air, white phosphorus will burn spontaneously, but red phosphorus will not.

12. Classify each observation as a physical or a chemical property and tally them.
    Observation 1: Bubbles form on a piece of metal when it is dropped into acid. CHEM
    Observation 2: The color of a crystalline substance is yellow. PHYS
    Observation 3: A shiny metal melts at 650°C. PHYS
    Observation 4: The density of a solution is 1.84 g/cm^3 PHYS
    a) 2 chemical properties and 2 physical properties
    b) 3 chemical properties and 1 physical properties.
    c) 1 chemical properties and 3 physical properties
    d) 4 chemical properties
    e) 4 physical properties

13. Filtration is a good way to separate the
    a) elements in a compound
    b) the components in a mixture
    c) the atoms in an element
    d) the phases of a pure substance

14. When a pure solid substance was heated, a student obtained another solid and a gas, each of which was a pure substance. From this information which of the following statements is ALWAYS a correct conclusion?
    a) The original solid is not an element. must be a compound
    b) Both products are elements. ? maybe
    c) The original solid is a compound and the gas is an element. maybe
    d) The original solid is an element and the gas is a compound.
    e) Both products are compounds. maybe

15. The prefix "milli-" corresponds to what multiplication factor?
    a) 10^{-6} ?
    b) 10^{-3}
    c) 10^{1} ?
    d) 10^{3} kilo
    e) 10^{6} mega

16. A solution of sugar water may be defined as a
    a) heterogeneous mixture
    b) homogeneous mixture looks like one phase
    c) heterogeneous compound
    d) homogeneous compound
    e) homogeneous element

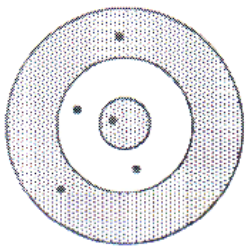
17. "Wafting" is the proper technique for
    a) neutralizing a spilled acid.
    b) putting out burning clothing.
    c) washing chemicals from the eye.
    d) smelling a chemical substance.
    e) observing the color of a chemical.

18. You measure the density of a slab of lead as 11.10 g/mL. The accepted value is 11.34 g/mL. The percent error for your measurement is
    a) 2.1 % c) 3.7 %
    b) 2.4 % d) 5.1 %

$\frac{(11.34 - 11.10)}{11.34} \times 100 = 2.1164$ (2 S.F.)

19. Which one of the following elements is correctly matched with its symbol?
    a) Ag, gold — silver
    b) Ni, nickel
    c) Fl, fluorine — F not Fl
    d) Mg, manganese — magnesium
    e) H, helium — He ≠ Hydrogen

20. The marks on the following target represent someone who is:



    a) accurate, but not precise.
    b) precise, but not accurate.
    c) both accurate and precise.
    d) neither accurate nor precise.

not centered on the Bulls eye

not close together

Answers: *(Please use CAPITAL letters)*

1.	C	11.	D
2.	E	12.	C
3.	B	13.	B
4.	E	14.	A
5.	B	15.	B
6.	B	16.	B
7.	E	17.	D
8.	A	18.	A
9.	C	19.	B
10.	C	20.	D

Answers:
1.C 2.E 3.B
4.E 5.B 6.B
7.E 8.A 9.C
10.C 11.D
12.C 13.B
14.A 15.B
16.B 17.D
18.A 19.B
20.D