Chemistry 11 – Review for Quiz #1 – Units, Density and Significant Figures

1. Complete the following table (Try it from memory first)

Prefix	Abbreviation	Exponent
micro	μ	10^{-6}
mega	M	10^{6}
deci	d	10^{-1}
milli	m	10^{-3}
kilo	k	10^{3}
centi	c	10^{-2}

2. Make the following unit conversions U=I x CF…

a) 0.00085 L = 850 μL

b) 50 ks = 50 x 10^{-3} Ms

c) 2 cg = 2 x 10^{4} μg

d) 0.1 dm = 0.1 x 10^{2} mm

e) 0.96 kg/L = 0.96 x 10^{0} mg/μL

3. The density of molybdenum is 10.2 g/mL. What is the mass of a 0.60 L piece of Mo?

U=I x CF x CF

g=0.60 l x 10.2g / 1 ml x 1 ml / 10^{-3} l = 6.12 x 10^{3} g = 2 sf g

4. 110.9 mL of gadolinium has a mass of 0.875 kg. Calculate the density of gadolinium in units of g/L.

U=I x CF x CF

g/l = 0.875 kg / 110.9 ml x 1 ml / 10^{-3} l x 10^{3} g / 1 kg = 0.00789 x 10^{6} g/l = 7.89 x 10^{3} g/l = 3 sf g/l

5. The density of tungsten is 19 300 g/L. Find the volume occupied by a 2.0 kg sample of tungsten.

U=I x CF x CF

L=2.0 kg x 10^{3} g / 1 kg x 1 L / 19300 g = 0.10 OR 1.0 x 10^{-1} l = 2 sf L

6. a) The density of carbon dioxide at standard temperature and pressure is 1.96 g/L. Calculate the mass of a 600 mL sample of carbon dioxide.

U=I x CF x CF

$g = 600 \cancel{ml} \times \frac{1.96\ g}{1\ \cancel{l}} \times \frac{10^{-3}\cancel{l}}{1\cancel{ml}} =$ 1.18g = 3 sf g

b) The density of air is about 1.29 g/L at standard temperature and pressure. Would carbon dioxide tend to rise up or sink down in the atmosphere?

Sink because its density of CO_2 is 1.96 g/L.

7. Of the following balances, which is the most precise?

a) 

b) 

c) 

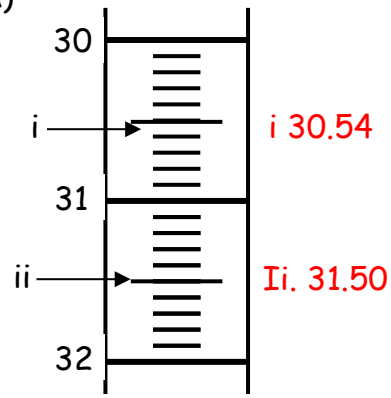
Answer C How do you know? MORE SIGNIFICANT FIGURES

8. The LAST digit in any measurement has some uncertainty because it is guessed or rounded.

9. The number of certain digits + 1 is called the number of SIGNIFICANT DIGITS

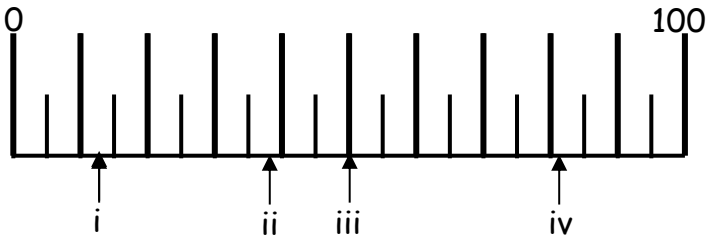
11. What is meant by the **accuracy** of a measurement? If it is correct every time

12. On each of the following scales, determine the correct reading which the arrow is pointing to. The answer must be expressed in the number of significant digits which accurately reflects the precision of the instrument.

a) 

i 30.54

Ii. 31.50

b) 

i 13 ii 38 iii 50 iv 81

13. Determine the number of **significant digits** (figures) in each of the following numbers.

a) 45.002 5 b) 3.400×10^{-4} 4 c) 0.000003 1 d) 3 000 1

14. Express each of the following numbers in scientific notation to **2 significant** figures.

a) 45 670 4.6×10^{4} b) 0.000 034 48 3.4×10^{-5} c) 3 000 000 3.0×10^{6}

15. Perform the following calculations and express the answer in the correct number of significant digits or decimal places as justified by the data. Don't forget the rules for multiplication and division and for addition and subtraction.

a) 3.4587 x 0.0112 = 3SF

b) $5.600 \times 10^{-7} / 0.700$ = 3 SF

c) 8.6 + 0.4573 = 1 DP

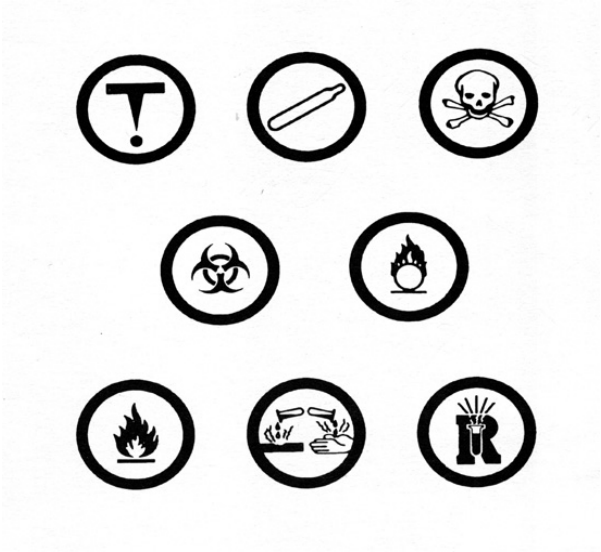
d) 3.2697 – 0.411 = 3DP

e) $2.68 \times 10^{3} + 1.229 \times 10^{5}$ = 2DP

f) $2.3 \times 10^{-7} \times 8.22298$ =2SF

16. Describe three safety concerns that you deem most important in the Chemistry lab.
Eye splash, fire, broken glass, spills, burns, inhalation, exposure…..

17. What information can be gained from the following symbols? Explain each!



Long-term toxic, compressed gas, toxic

Biohazard, oxidizer

Flammable, corrosive, radioactive