CHM 151 Quiz 1a 25 Pts Fall 2006 Name:_____Key_____

Show All Work To Receive Credit! Conversion factors and prefixes:

$G = 10^9$, $M = 10^6$, $k = 10^3$, $c = 10^{-2}$, $m = 10^{-3}$, $\ae = 10^{-6}$, 2.54 cm = 1 in,
12 in = 1 ft, 5280 ft = 1 mile, 3 feet = 1 yd, 60 sec = 1 min, 1 hr = 60 min

1. (6 Pts) A Car is traveling at a rate of 25 km/hr. How fast is the car going in miles per second?

$$\frac{25 \cancel{km}}{hr} \left| \frac{10^3}{\cancel{m}} \right| \frac{\cancel{in}}{2.54 \times 10^{-2} \cancel{m}} \left| \frac{1 \cancel{ft}}{12 \cancel{in}} \right| \frac{1 mi}{5280 \cancel{ft}} \left| \frac{\cancel{hr}}{3600 s} \right. = 4.3 \times 10^{-3} \frac{mi}{s}$$

2. (4 Pts) Convert each of the following to scientific notation (without the use of prefixes):

a. 47 Giga Mega kilo dollars = $\underline{47 \times 10^9 \times 10^6 \times 10^3 = 47 \times 10^{18}}$ dollars 4.7×10^{19} \$

b. 3.0 x 10^{10} millimeters = $\underline{3.0 \times 10^{10} \times 10^{-3} = 3.0 \times 10^7}$ meters

3. (5 Pts) A car engine size is listed as 351 cubic iches (in^3). What would its size be in Liters?

$$\frac{351 in^3}{} \left| \frac{2.54^3 \cancel{cm^3}}{1^3 \cancel{in^3}} \right| \frac{1 \cancel{mL}}{1 \cancel{cm^3}} \left| \frac{10^{-3}}{\cancel{m}} \right. = 5.75 L$$

4. (5 Pts) A certain chemical procedure requires 405.6 cm of iron wire. How many feet of iron wire are required?

$$\frac{405.6 \cancel{cm}}{} \left| \frac{1 \cancel{in}}{2.54 \cancel{cm}} \right| \frac{1 ft}{12 \cancel{in}} = 13.31 ft$$

5. (5 Pts) A sample of silver ore was found to contain 2.56 % silver by mass. How many grams of silver can be recovered 800.0 kg of ore?

$$\frac{800.0 \times 10^3 g \cancel{ore}}{} \left| \frac{2.56 Ag}{100 \cancel{ore}} \right. = 2.048 \times 10^4 g Ag$$

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12 in = 1 ft, 5280 ft = 1 mile, 3 feet = 1 yd, 60 sec = 1 min, 1 hr = 60 min

1. (6 Pts) A Car is traveling at a rate of 25 km/hr. How fast is the car going in miles per second?

$$\frac{25\ km}{hr} \left| \frac{10^3}{k} \right| \frac{in}{2.54 \times 10^{-2}\ m} \left| \frac{1\ ft}{12\ in} \right| \frac{1\ mi}{5280\ ft} \left| \frac{hr}{3600\ s} \right. = 4.3 \times 10^{-3} \frac{mi}{s}$$

2. (4 Pts) Convert each of the following to scientific notation (without the use of prefixes):

a. 47 Giga Mega kilo dollars = $47 \times 10^9 \times 10^6 \times 10^3 = 47 \times 10^{18}$ dollars 4.7×10^{19} $

b. 3.0 x 10^{10} millimeters = $3.0 \times 10^{10} \times 10^{-3} = 3.0 \times 10^7$ meters

3. (5 Pts) A car engine size is listed as 351 cubic iches (in^3). What would its size be in Liters?

$$\frac{351\ in^3}{} \left| \frac{2.54^3\ cm^3}{1^3\ in^3} \right| \frac{1\ mL}{1\ cm^3} \left| \frac{10^{-3}}{mL} \right. = 5.75\ L$$

4. (5 Pts) A certain chemical procedure requires 405.6 cm of iron wire. How many feet of iron wire are required?

$$\frac{405.6\ cm}{} \left| \frac{1\ in}{2.54\ cm} \right| \frac{1\ ft}{12\ in} = 13.31\ ft$$

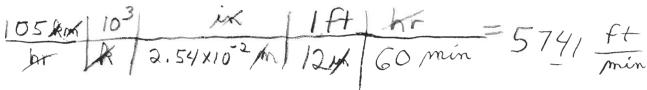5. (5 Pts) A sample of silver ore was found to contain 2.56 % silver by mass. How many grams of silver can be recovered 800.0 kg of ore?

$$\frac{800.0 \times 10^3\ g\ ore}{} \left| \frac{2.56\ Ag}{100\ ore} \right. = 2.048 \times 10^4\ g\ Ag$$

<u>Show All Work To Receive Credit!</u> Conversion factors and prefixes:

G = 10^9, M = 10^6, k = 10^3, c = 10^{-2}, m = 10^{-3}, æ = 10^{-6}, 2.54 cm = 1 in,
12 in = 1 ft, 5280 ft = 1 mile, 3 feet = 1 yd, 60 sec = 1 min, 1 hr = 60 min

1. (6 Pts) A Car is traveling at a rate of 105 km/hr. How fast is the car going in feet per minute?

$$\frac{105 \, km}{hr} \left| \frac{10^3}{k} \right| \frac{in}{2.54 \times 10^{-2} \, m} \left| \frac{1 \, ft}{12 \, in} \right| \frac{hr}{60 \, min} = 5741 \, \frac{ft}{min}$$

2. (5 Pts) (5 Pts) A sample of silver ore was found to contain 2.86 % silver by mass. How many grams of silver can be recovered 800.0 kg of ore?

$$\frac{800.0 \times 10^3 \, g \, ore}{} \left| \frac{2.86 \, Ag}{100 \, ore} \right. = 2.288 \times 10^4 \, g \, Ag$$
$$2.29 \times 10^4$$

3. (5 Pts) A car engine size is listed as 351 cubic inches (in^3). What would its size be in Liters?

$$\frac{351 \, in^3}{} \left| \frac{2.54^3 \, cm^3}{1^3 in^3} \right| \frac{1 \, mL}{1 \, cm^3} \left| \frac{10^{-3}}{m} \right. = 5.75 \, L$$

4. (4 Pts) Convert each of the following to scientific notation without the use of prefixes:

                 $10^9 \quad 10^{-3} \quad 10^{-2} \quad 10^3$
  a. 47 Giga milli centi kilo dollars = $\underline{\quad 47 \times 10^7 = 4.7 \times 10^8 \quad}$ dollars

                     $m = 10^{-3}$
  b. 3.0 x 10^{10} millimeters = $\underline{\quad 3.0 \times 10^7 \quad}$ meters

5. (5 Pts) A certain chemical procedure requires 452.6 cm of iron wire. How many feet of iron wire are required?

$$\frac{452.6 \, cm}{} \left| \frac{1 \, in}{2.54 \, cm} \right| \frac{1 \, ft}{12 \, in} = 14.85 \, ft$$