CHM 151 Quiz 1a 25 Pts Fall 2016 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}, μ = 10^{-6}, n = 10^{-9} , 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, 4 quarts = 1 gal, 2 pints = 1 quart

1. (6 Pts) Perform each of the following conversions. You must show the complete setup.

a. Convert 1215 μg to ng. $1215\ \mu g \left| \frac{10^{-6}}{\mu} \right| \frac{n}{10^{-9}} = 1215 \times 10^3\ ng$ or $1.215 \times 10^6\ ng$

b. Convert 222 **mL to μL.** $222\ mL \left| \frac{10^{-3}}{m} \right| \frac{u}{10^{-6}} = 222000\ uL$ or $2.22 \times 10^5\ uL$

2. (4 Pts) Assume each of following numbers are measurements. Perform the indicated operations and then report the answer with the proper number of significant figures.

a. 15.145 cm + 15.1265 cm + 25.22 cm = 55.4915 = 54.49 (Place) cm

b. 10.25 cm x 8.10 cm x 10.145 cm = 842.288625 = 842 (3 sig. Figs) cm^3

3. (5 Pts) A poster measures 25 inches by 32 inches. Determine its area in **square inches** and in **square cm (cm^2)**. (you may ignore significant figures).

a. in^2 $25\ in \times 32\ in = 800\ in^2$

b. cm^2 $800\ in^2 \left| \frac{2.54^2\ cm^2}{1^2\ in^2} \right. = 5161.28\ cm^3$

4. (5 Pts) How many kilo-inches are in 2 miles (You may ignore significant figures) (conversion factors are listed on the top of the page)?

$2\ mi \left| \frac{5280\ ft}{1\ mi} \right| \frac{12\ in}{ft} \left| \frac{k}{10^3} \right. = 126.72\ k\ in$

5. (5 Pts) A sample of silver ore was found to contain 0.26 % silver by mass. How many mg of silver can be recovered 800.0 kg of ore? (You must show setup)

$800.0 \times 10^3\ g\ ore \left| \frac{0.26\ Ag}{100\ ore} \right| \frac{m}{10^{-3}} = 2.08 \times 10^6\ mg\ Ag$

2,080,000 mg 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, 4 quarts = 1 gal, 2 pints = 1 quart

1. (6 Pts) Perform each of the following conversions. You must show the complete setup.

a. Convert 627 nL to mL. $\frac{627\,nL}{1} \left| \frac{10^{-9}}{n} \right| \frac{m}{10^{-3}} = 627 \times 10^{-6}\,mL$ or $6.27 \times 10^{-4}\,mL$

b. Convert 75 mg to μg. $\frac{75\,mg}{1} \left| \frac{10^{-3}}{m} \right| \frac{\mu}{10^{-6}} = 75 \times 10^{3}\,\mu g$ or $7.5 \times 10^{4}\,\mu g$

2. (4 Pts) Assume each of following numbers are measurements. Perform the indicated operations and then report the answer with the proper number of significant figures.

a. 313.4 cm + 212.526 cm + 0.052 cm = 525.978 ⇒ 526.0 cm
(sig. to this place)

b. 7.2 cm x 6.12 cm x 12.145 cm = 535.1 ⇒ 540 cm^3
(2 sig. figs.)

3. (5 Pts) A poster measures 33 inches by 45 inches. Determine its area in **square inches** and in **square cm (cm^2).**
(You may ignore significant figures)

a. in^2 $33\,in \times 45\,in = 1485\,in^2$

b. cm^2 $\frac{1485\,in^2}{1} \left| \frac{2.54^2\,cm^2}{1^2\,in^2} \right. = 9580\,cm^2$

4. (5 Pts) How many inches are in 1.8 kilo-miles (You may ignore significant figures)?

$\frac{1.8 \times 10^3\,mi}{1} \left| \frac{5280\,ft}{1\,mi} \right| \frac{12\,in}{1\,ft} = 11404800\,in$ or $1.14 \times 10^8\,in$

5. (5 Pts) A sample of silver ore was found to contain 0.056 % silver by mass. How many mg of silver can be recovered 500.0 kg of ore? (you must show the setup)

$\frac{500.0 \times 10^3\,g}{1} \left| \frac{m}{10^{-3}} \right| \frac{0.056\,Ag}{100\,ore} = 280{,}000\,mg\,Ag$

$2.8 \times 10^5\,mg\,Ag$