This quiz is take-home and open book, and it is intended that all members of the group contribute to completing it. It is a violation of the Academic Honor Code to sign a quiz that you did not work on. The quiz is due at the beginning of class on Thursday, September 7.

**List names in alphabetical order, and give social security numbers! Put names on all pages, and staple pages together**

Average =12.8

Median =13.0

High =15.0

Points

(4) 1. Write each of the following numbers in exponential notation, and give the number of significant figures in the number:

<table>
<thead>
<tr>
<th>Number</th>
<th>Exponential Notation</th>
<th>Significant Figures</th>
</tr>
</thead>
<tbody>
<tr>
<td>546.21</td>
<td>5.4621 x 10^2</td>
<td>5</td>
</tr>
<tr>
<td>0.0005050</td>
<td>5.050 x 10^-4</td>
<td>4</td>
</tr>
<tr>
<td>20.02</td>
<td>2.002 x 10</td>
<td>4</td>
</tr>
<tr>
<td>3105.0</td>
<td>3.1050 x 10^3</td>
<td>5</td>
</tr>
</tbody>
</table>

(4) 2. Carry out the following calculations, giving the answer in exponential notation and to the correct number of significant figures:

(a) $25.29 \times 0.0016 = 4.0446 \times 10^{-2}$ (round to 2 sig. fig.)

(b) $\frac{203.27 \times 10^{-2} \times 0.51}{1456} = 7.1200 \times 10^{-4}$ (round to 2 sig. fig.)

(c) $3.12 + 0.04567 = 3.16567$ or 3.17 (round to hundredths position)

(d) $9.2567 - 9.2531 = 3.6 \times 10^{-3}$ (significant to fourth decimal place, but still only 2 significant figures)

(2) 3. The density of Hg is 13.6 g/mL. What does Hg stand for? What volume would 123.6 g of Hg occupy?

Hg is mercury. $123.6 \text{ g} \times \frac{1 \text{ mL}}{13.6 \text{ g}} = 9.09 \text{ mL}$ (minus 0.1 point if 9.088 is given)
List names in alphabetical order. **Be sure to staple pages together!**

(3) 4. Carry out the following unit conversions:

- 4.26 km to cm
  
  $$4.26 \text{ km} \times \frac{1 \text{ m}}{1 \text{ km}} \times \frac{1 \text{ cm}}{10^{-2} \text{ m}} = 4.26 \times 10^5 \text{ cm}$$

- 55 L to mL
  
  $$55 \text{ L} \times \frac{1 \text{ mL}}{10^3 \text{ L}} = 5.5 \times 10^4 \text{ mL}$$

- 35 °C to K
  
  $$35 \degree \text{C} + 273.15 = 308 \text{ K}$$ (ok if only 273 is indicated)

(2) 5. 15.0 g of mercury oxide decomposes upon heating into 13.9 g of mercury and oxygen.

(a) How many grams of oxygen are produced in this reaction?

$$15.0 \text{ g mercury oxide} - 13.9 \text{ g mercury} = 1.1 \text{ g oxygen}$$

1 pt.

(b) How much mercury oxide would be required to produce 14 g of oxygen?

$$\frac{x \text{ g mercury oxide}}{14 \text{ g oxygen}} = \frac{15.0 \text{ g mercury oxide}}{1.1 \text{ g oxygen}}$$

1 pt.

$$x \text{ g mercury oxide} = 15.0 \text{ g mercury oxide} \times \frac{14 \text{ g oxygen}}{1.1 \text{ g oxygen}} = 1.9 \times 10^2 \text{ g}$$

(-0.1 pt if answer given to more than two significant figures)