1. (3 points) Although there is only one naturally occurring isotope of gold, $^{197}\text{Au}$, the atomic mass of gold given in the modern periodic table is 196.96655, but not 197. Explain.

2. (3 points) On the old atomic mass scale used by physicists, the mass of oxygen-16 atom was assigned to be exactly 16 amu. What would be the mass of one atom of gold on that scale? Show work.

3. (3 points) How many different types of CO$_2$ molecule exist in nature? Explain.

   What is the mass of the *most common* of those molecules? ____________ amu

   What is the mass of the *heaviest* of those molecules? ____________ amu

   What is the *average* mass of all those molecules? ____________ amu

PLEASE TURN OVER!!!
4. (3 points) In the periodic table of elements, atomic weights for some elements are given with very many significant digits whereas for some other elements with considerably fewer.

(a) What kind of elements are those with the largest numbers of significant digits in their atomic weights?

(b) What kind of elements are those with the smallest numbers of significant digits in their atomic weights?

5. (3 points)
   (a) Fill the blanks.

   \[
   1 \text{ km} = \underline{\hphantom{000}} \text{ cm} \quad 1 \text{ km}^2 = \underline{\hphantom{000}} \text{ cm}^2 \quad 1 \text{ km}^3 = \underline{\hphantom{000}} \text{ cm}^3
   \]

   (b) What is the edge of a cube **in millimeters** if the volume of that cube is \(1.25 \times 10^8 \text{ nm}^3\)?

   **Show work.**