Problem Set #1 – Due by 5 p.m. Monday, August 26, 2019

Please answer the following questions **<u>on a separate sheet (or sheets) of paper</u>**. Be sure to **show all your work and/or reasoning.** Partial credit may only be awarded for incorrect answers if work is shown. Remember to report your answers with the appropriate units and significant figures. Refer to your textbook or class notes (or Google) for any conversion factors not provided here.

1. Please complete the following conversions:
    a. 833 MHz: convert to Hz
    b. 2525 cm^3: convert to m^3
    c. 372 µg/L: convert to pg/cm^3
    d. 5.0 m/s: convert to km/hr

2. Suppose that you need a cube of aluminum with a mass of 7.6 g. What must be the length of the cube's edge in cm? (The density of aluminum is 2.698 g/cm^3.)

3. Popcorn is sold by the pound in the US. If the average popcorn kernel has a mass of 0.125 g, how many kernels are there in an average pound of popcorn?

4. Benjamin Franklin once showed that 1 teaspoon of oil would cover about 0.5 acre of still water.
    a. Given that 1.0×10^4 m^2 = 2.47 acres, and that the volume of 1 teaspoon = 5 cm^3 (exactly), what is the thickness of the layer of oil?
    b. Using the thickness determined in (a), what area of still water would a single barrel of oil cover? (1 barrel = 42 gallons exactly)

5. Copper has a density of 8.96 g/cm^3. An ingot of copper with a mass of 57 kg is drawn into wire with a diameter of 9.50 mm. How many meters of (cylindrical) wire can be produced? [**Hint:** You will need an equation for the volume of a cylinder.]