

# PHY121

## Homework #1 (10 points)

### Problem #1 Density (2pt)

To determine the volume of an irregularly shaped glass vessel, the vessel is weighed empty (121.3g) and when filled with the carbon tetrachloride (283.2 g). What is the volume capacity of the vessel, in milliliters, given that the density of carbon tetrachloride is 1.59g /mL?

### Problem #2 Temperature Scales (2pt)

We wish to mark off a thermometer in both Celsius and Fahrenheit temperatures. On the Celsius scale, the lowest temperature is at  $-10^{\circ}\text{C}$ , and the highest temperature mark at  $50^{\circ}\text{C}$ . What are the equivalent Fahrenheit temperatures?

Use conversion formula:  $^{\circ}\text{C} = 5/9 \times (^{\circ}\text{F} - 32)$ .

### **Problem #3 Units of Measurement (2pt)**

useful information:

$$1 \text{ in} = 2.54 \text{ cm};$$

$$1 \text{ pound (lb)} = 453.6 \text{ g};$$

$$1 \text{ qt} = 0.9464 \text{ L}$$

a) Perform the following conversions:

$$0.127 \text{ L} = \dots \text{ mL?}$$

$$14.7 \text{ mL} = \dots \text{ L?}$$

$$782 \text{ cm}^3 = \dots \text{ L?}$$

$$1.57 \text{ kg} = \dots \text{ g?}$$

$$745 \text{ g} = \dots \text{ kg?}$$

$$2757 \text{ mm} = \dots \text{ cm?}$$

b) Perform the following conversions from non-SI to SI units:

$$68.4 \text{ in} = \dots \text{ cm?}$$

$$1.42 \text{ lb} = \dots \text{ g?}$$

$$3.72 \text{ qt} = \dots \text{ mL?}$$

Problem #4 Significant Figures (2pt)

Express each of following to four significant figures:

- a) 4271.5
- b) 344.03
- c) 257,000
- d) 55,700
- e)  $7.312 \times 10^4$
- f)  $4.0357 \times 10^{-4}$

Problem #5 Significant figures (2pt)

Express each answer in exponential form and with the appropriate numbers of significant figures:

- a)  $0.406 \times 0.0023 = ?$
- b)  $0.1357 \times 16.80 \times 0.096 = ?$
- c)  $0.458 + 0.12 - 0.037 = ?$
- d)  $32.18 + 0.055 - 1.652 = ?$