Lesson 2 Assignment

Part B

Work slowly and carefully. If you are having difficulty, go back and review the appropriate *Lesson*.

For full marks, show all calculations, steps, and/or explain your answers.

Total: 25 marks.

6. A speedometer on a motorcycle measures the speed the vehicle is travelling in $\mathrm{km/h}$, and the odometer measures the distance the vehicle travelled in km.
Note: The value of "4" on the odometer is in the tenth place.

(2) a. What is the precision and uncertainty of the speedometer?

precision: _____

uncertainty: _____

(2) b. What is the precision and uncertainty of the odometer?

precision: _____

uncertainty: _____

(1) c. Explain why the precision of the speedometer and odometer are different.

(1) d. While travelling in a $80\ \text{km/h}$ zone, the motorcycle's speedometer reads $85\ \text{km/h}$. An officer measures the speed, using an accurate speed gun, to be $93\ \text{km/h}$. How could the accuracy of the speedometer be improved?

(1) e. Explain why it is important that the speedometer reading is accurate?

(1) 7. Medicine can be given to children using two types of measuring tools.

Measuring cup labelled with $2.5\ \text{mL}$, $5\ \text{mL}$, $7.5\ \text{mL}$, $10\ \text{mL}$, $12.5\ \text{mL}$, and $15\ \text{mL}$ increments.

Syringe with $1\ \text{mL}$ increments.

Yun requires $4\ \text{mL}$ of cough syrup. What measuring tool should be used? Explain.

8. Ed and Joe both measure the height of a refrigerator three times to ensure that it fits in the kitchen under a cupboard. Their measurements are below.

Ed	$180.2\ \text{cm}, 180.1\ \text{cm}, 179.9\ \text{cm}$
Joe	$175.26\ \text{cm}, 181.47\ \text{cm}, 183.98\ \text{cm}$

(1) a. Is Ed's or Joe's measuring tool more precise? Explain.

(1) b. Which set of measurements is the most precise? Explain.

(1) c. Which set of measurements are considered to be the most accurate? Explain.

9. Lucy measures the mass of her chocolate bar (true mass is $53.474\ 074\ \text{g}$) using different devices. For each measuring tool, state the measurement that should be recorded and the measurement uncertainty.

(2) a. kitchen scale with a precision to the nearest $5\ \text{grams}$

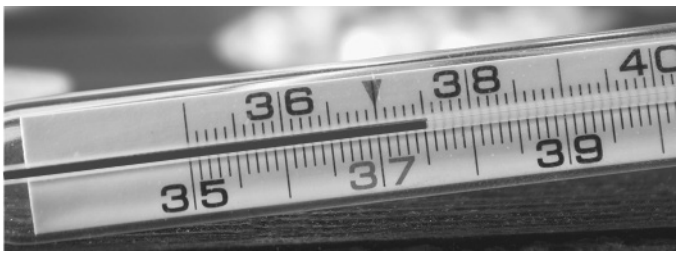
_____ g ± _____ g

(2) b. a digital scale with a precision of a tenth of a gram

_____ g ± _____ g

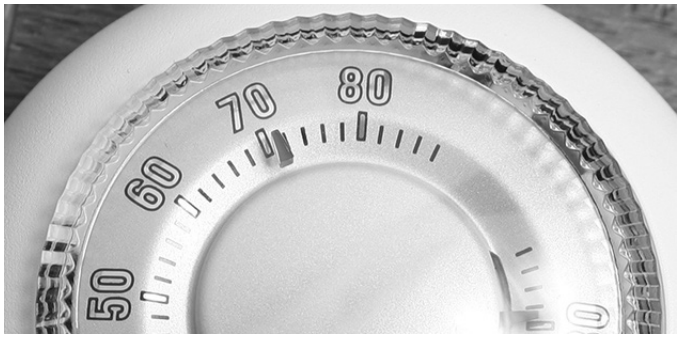
10. State the measurements shown in the devices below.

(2) a. a glass mercury thermometer that measures in $^{\circ}C$



_____ $^{\circ}C \pm$ _____ $^{\circ}C$

(2) b. a thermostat that measures in $^{\circ}F$



_____ $^{\circ}F \pm$ _____ $^{\circ}F$

11. When renovating her bathroom, Gretchen measured the length of the bathtub to be 5 feet and the length of the counter to be 3 feet.

(2) a. Write the measurements for the bathtub and counter with their uncertainties.

bathtub: _____

sink: _____

(3) b. If both the bathtub and sink are to be along one wall, what are the minimum and maximum lengths required for only the bathtub and counter.

measurement: _____ minimum length _____

uncertainty: _____ maximum length _____

length: _____

12. In the provincial high school track meet, the results for the top four male sprinters in the $100\ \text{m}$ and their times are shown in the following table.

Top 4 Sprinters, 100 m	
Runner	**Time (seconds)**
Harv Hunt	11.21
Justin Ward	11.24
Kyle Zinski	11.29
Lester Frank	11.40

(1) Based on these results, explain why the precision of the stopwatch must be at least 0.01 of a second.