Uncertainty Propagation — Student Practice

LAB REPORT & DATA QUALITY / PRACTICE

Name: _____ Date: _____

Show units and work. State assumptions and reporting precision. Leave enough space for each explanation.

1. **A final mass is 16.42 ± 0.02 g and tare is 12.10 ± 0.02 g, with independent 1σ uncertainties. Find difference and combined uncertainty.**

2. **A final volume is 35.70 ± 0.05 mL and initial is 31.25 ± 0.05 mL. Find dispensed volume and uncertainty.**

3. **A mass difference is 3.6 g from two independent readings each with u=0.1 g. Calculate relative uncertainty (%).**

4. **For 8.00 ± 0.10 mL and 5.00 ± 0.05 mL independent standard uncertainties, calculate their sum and u(sum).**

5. **What assumption justifies root-sum-of-squares uncertainty for two readings?**

6. **Why is a claimed balance tolerance (e.g., ±0.01 g) not automatically a 1σ standard uncertainty?**