Date_____Room Temp. _____BP (Barometric Pressure)_____Department_____

Group Number_____Student Number_____Name_____Grade_____

Lab 02 Vernier Caliper

1、Outer Diameter：Zero C＝_____（right－ left＋）

No	main ruler r (mm)	vernier v	$L = r + \frac{v}{10}$ (mm)	length $h_i = L + C$ (mm)	arithmetic mean a.m. $= \Sigma h_i / n$ (mm)	deviation $d_i = h_i -$ a.m. (mm)	sample standard deviation $s = \sqrt{\frac{\sum_{i=1}^{N} d_i^2}{N-1}}$ (mm)
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

error $= \frac{s}{\sqrt{N}}$ (mm)		percentage error $= \frac{error}{a.m.} \times 100\%$		measurement result $H =$ a.m. $\pm$ percentage error	

2、Internal Diameter：Zero C＝_____（right－ left＋）

No	main ruler r (mm)	vernier v	$L = r + \frac{v}{10}$ (mm)	length $h_i = L + C$ (mm)	arithmetic mean a.m. $= \Sigma h_i / n$ (mm)	deviation $d_i = h_i -$ a.m. (mm)	sample standard deviation $s = \sqrt{\frac{\sum_{i=1}^{N} d_i^2}{N-1}}$ (mm)
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

error $= \frac{s}{\sqrt{N}}$ (mm)		percentage error $= \frac{error}{a.m.} \times 100\%$		measurement result $H =$ a.m. $\pm$ percentage error	

3、Depth：Zero C＝_____（right－　left＋）

No	main ruler r (mm)	vernier v	$L = r + \frac{v}{10}$ (mm)	length $h_i = L + C$ (mm)	arithmetic mean a.m. $= \Sigma h_i / n$ (mm)	deviation $d_i = h_i -$ a.m. (mm)	sample standard deviation $s = \sqrt{\frac{\sum_{i=1}^{N} d_i^2}{N-1}}$ (mm)
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

error $= \frac{s}{\sqrt{N}}$ (mm)		percentage error $= \frac{error}{a.m.} \times 100\%$		measurement result $H =$ a.m. $\pm$ percentage error	

4、Volume：

A. Object volume [(π /4) × (internal diameter)^2 × (Depth)] ＝_____mm^3

B. Percentage error of the volume=_____%

C. Error of the volume (A×B) ＝_____mm^3

D. Observation＝ A mm^3± C mm^3

5、Comparisons among the outer diameter, inter diameter and depth：

Sample standard deviation：_____＞_____＞_____

Error：_____＞_____＞_____

Percentage error：_____＞_____＞_____

Date_____Room Temp. _____BP (Barometric Pressure)_____Department_____
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