

1、 Please rewrite the following expression correctly.

1)  $5.205 \pm 0.02$

2)  $6.8651 \pm 0.03$

3)  $72.312 \pm 0.162$

4)  $200700 \pm 200$

5)  $0.003891 \pm 0.0000682$

2、 Find out the final results (Please give the detailed procedures)

1)  $6.85 \times 2.78 + 40.0 \times 15.02 + 0.320 \times 0.1$

2)  $7.03 \times 10^4 - 600$

3)  $\frac{1}{(0.2000)^2} - \frac{1}{(0.5000)^2}$  (Where the "1" is accurate)

4)  $\frac{(5.485 - 5.0) \times 5.168}{5.20}$

5)  $4.250 \times 1.800 \times (1 + \frac{7}{200})$  (Where the "1" is accurate)

3、 Measure the thickness of a metal sheet with micrometer caliper for 10 times, which has its maximum uncertainty  $a$  0.004 mm. The data is listed in the following table:

| 序号            | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    |
|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| $d/\text{mm}$ | 0.762 | 0.764 | 0.763 | 0.760 | 0.765 | 0.762 | 0.760 | 0.763 | 0.764 | 0.762 |

Please evaluate the measurement result. (The average value of  $d$  and its uncertainty in the form of  $\bar{d} \pm u(\bar{d}) = ??$ .)

4、 We measure the length of an object with a ruler, which has the smallest scale 1mm and its maximum uncertainty 0.10 mm. If the parallax is well eliminated. The readout of the right end is  $l_1=11.17\text{cm}$  and that of the left end is  $l_2=2.00\text{cm}$ . Please find the length  $l$  and its uncertainty  $u(l)$ . Express the final results in the form of  $l \pm u(l)=$ \_\_\_\_\_.

5、 During the measurement of the gravity acceleration  $g$  through a pendulum, we got data as listed below.

The length of the pendulum:  $l=(90.5\pm 0.2)\text{cm}$ ,

The period of the pendulum:  $T=(1.910 \pm 0.005)\text{s}$ ,

Please find the gravity ( $g$ ) and its uncertainty. ( $g = 4\pi^2 \frac{l}{T^2}$  )

6、 The resistance of a magnetoresistive sensor was measured at different magnetic field. The data are given in the table below.

|               |       |       |       |       |       |       |       |       |       |       |
|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| $B/\text{mT}$ | 0.0   | 9.8   | 20.4  | 29.5  | 40.2  | 50.8  | 61.0  | 70.5  | 81.0  | 91.2  |
| $R/\Omega$    | 510.2 | 515.0 | 520.2 | 525.8 | 529.8 | 535.7 | 542.0 | 545.0 | 550.6 | 555.8 |

Please find the relation between the resistance and magnetic field, and draw the  $R$ - $B$  curve.