Activity 3

1. (a) $4700\,K\Omega \pm 1\% = (4700 \pm 47)\,K\Omega$

   (b) $39\,K\Omega \pm 1\% = (39 \pm 0.39)\,K\Omega$
   (c) $1500\,K\Omega \pm 1\% = (1500 \pm 15)\,K\Omega$
   (d) $830\,K\Omega \pm 1\% = (830 \pm 0.83)\,K\Omega$
   (e) $10\,M\Omega \pm 1\% = (10 \pm 0.10)\,M\Omega$

2. (a) Mastech MS8268
   (b) $400\Omega / 4K\Omega / 40K\Omega / 400K\Omega / 4M\Omega \pm (1.2\% + 2)$
   $40M\Omega \pm (2\% + 5)$
   (c) $400\,mV / 4V / 40V / 400V \pm (0.7\% + 2)$ $1000V \pm (0.8\% + 2)$
   (d) $400\,\mu A / 4mA / 40mA / 400mA \pm (1.2\% + 3)$ $10A \pm (2.0\% + 5)$

3. (a) $4.26\,M\Omega$ $\delta(rdg) = 57.12\,K\Omega$
   (b) $38.9\,K\Omega$ $\delta(rdg) = 466.80\,\Omega$
   (c) $1.497\,K\Omega$ $\delta(rdg) = 17.96\,\Omega$
   (d) $0.830\,M\Omega$ $\delta(rdg) = 9.99\,K\Omega$
   (e) $10.11\,M\Omega$ $\delta(rdg) = 121.32\,K\Omega$

4.

	Reported	Range	Observed	Range
(a)	$4.7M\Omega \pm 1\%$	$4.65M\Omega - 4.75M\Omega$	$(4.76 \pm 57.12)M\Omega$	$4.70M\Omega - 4.82M\Omega$
(b)	$39.0K\Omega \pm 1\%$	$38.6K\Omega - 39.39K\Omega$	$38.9K\Omega \pm 466.8\Omega$	$38.43K\Omega - 39.37K\Omega$
(c)	$1.5K\Omega \pm 1\%$	$1.49K\Omega - 1.52K\Omega$	$1.497K\Omega \pm 17.96\Omega$	$1.48K\Omega - 1.51K\Omega$
(d)	$0.83M\Omega \pm 1\%$	$0.82M\Omega - 0.84M\Omega$	$0.83M\Omega \pm 9.96K\Omega$	$0.82M\Omega - 0.84M\Omega$
(e)	$10M\Omega \pm 1\%$	$9.9M\Omega - 10.1M\Omega$	$10.10M\Omega \pm 121.20K\Omega$	$9.98M\Omega - 10.2M\Omega$

Agree, only for (d).

5. Factory tolerance is more precise.

6. (a) $4.7\,M\Omega \pm 47k\Omega + 10M\Omega \pm 100k\Omega = 14.7M\Omega \pm 147k\Omega$

(b) $14.85\,M\Omega$

(c) $14.7M\Omega + 147k\Omega = 14.85\,M\Omega$ agree

(d) I don't know how this is different to part c.

7. (a) $\frac{1}{\frac{1}{R_1} + \frac{1}{R_2}} = 3.147M\Omega \pm 32\,k\Omega$

(b) $3.245\,M\Omega$

(c) NO

8. $1\% \pm 1$

9. Open Voltage: $4.97\,V \pm (0.7\% \pm 2)$

(a)

(b) The Multimeter has lower uncertainty

10. (a) $2.309 \times 10^{-3}\ A \pm 3.07 \times 10^{-5}\ A$
(b) $1.16 \times 10^{-3}\ A \pm 1.72 \times 10^{-6}\ A$
(c) $5.8 \times 10^{-6}\ A \pm 3.646 \times 10^{-7}\ A$
(d) $1.0 \times 10^{-6}\ A \pm 3.12 \times 10^{-7}\ A$
(e) $7 \times 10^{-7}\ A \pm 3.0 \times 10^{-7}\ A$