17: ~~29, 31, 33, 35, 37~~

18: ~~1, 3, 19, 21, 57, 61, 77~~

17.29 Wire with $R = 150\,\Omega$

$6 \times 1.5\,V$ batteries

$$V = IR \Rightarrow I = \frac{V}{R} = \frac{6 \cdot 1.5\,V}{150\,\Omega} = 0.06\,A$$

$$\boxed{I = 60\,mA}$$

17.31 V across a $1k\Omega$ resistor

$I = 2.5\,mA$

$$V = I \times R = (2.5 \times 10^{-3}\,A)(1000\,\Omega) = 2.5\,V$$

$$\boxed{V = 2.5\,V}$$

17.33 100 V draws 10 A:

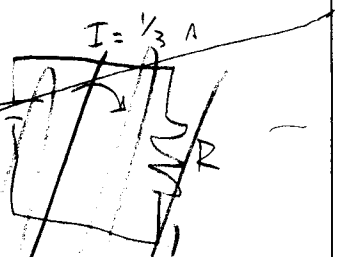
$$R = \frac{V}{I} = \frac{100\,V}{10\,A} = \boxed{10\,\Omega = R}$$

17.35 When on, $I = 0.33\,A$, $V = 3.9\,V$

$$P = VI = (3.9\,V)(0.33\,A) = \boxed{1.3\,W = P}$$

95% of this appears as thermal energy (heat), $R = ?$

$$V = IR \Rightarrow R = \frac{V}{I} = \frac{3.9\,V}{(1/3\,A)} = 11.7\,\Omega = \boxed{12\,\Omega = R}$$



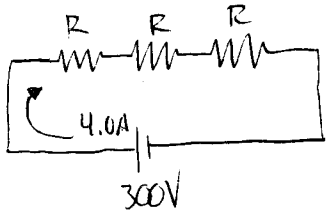
WEEK 4 HW

17.41, 17.47, 17.85, 17.87

18.1, 18.3, 18.7, 18.9, 18.21, 18.27, 18.57, 18.61, 18.77

19.3, 19.5, 19.11, 19.15

17.41



Voltage drop across each:

$\frac{1}{3}$ of 300 V

$V_R = 100\ V$ and $V_R = IR \Rightarrow R = \frac{V_R}{I} = \frac{100\ V}{4.0\ A} = 25\ \Omega = R$

17.47

$L = 5.0\ m$

$A = 2.0\ mm^2$ $\rho = ?$

$R = 40\ m\Omega$

$R = \frac{\rho L}{A} \Rightarrow \rho = \frac{RA}{L} = \frac{(40\times10^{-3}\ \Omega)(2.0\ mm^2)}{5.0\ m}\left(\frac{1\ m^2}{1000\ mm^2}\right)^2$

$\rho = 1.6\times10^{-8}\ \Omega/m$

17.85

$I = \frac{1}{3}\ A$

$V = 3.9\ V$

$P = VI = (3.9\ V)(\frac{1}{3}\ A)$

$P = 1.3\ W$

$R = ?$ $V = IR \Rightarrow R = \frac{V}{I} = \frac{3.9\ V}{(\frac{1}{3}\ A)} = 11.7\ \Omega = R$

17.87

Battery has a rating of 10 amp-hr.

What is P_{max} for 5 hr?

$P = VI$

$V = ?$ 5 NiCd cells in series @ 1.2 V each (pg. 702)

$\Rightarrow V = 5 \times 1.2\,V$

$V = 6$ Volts

$I = ?$ $\frac{10 \text{ amp-hr}}{5 \text{ hr}} = 2$ amps

$P = (6 \text{ Volts})(2 \text{ amps})$

$P = 12$ Watts