

HW 2 p 614 Problems 8, 13, ~~14~~ 47

(2)

p 614 - Problems

(5)

8) $V = 9.0V$

$I = 0.50A$

$t = ?$

$W = 200J$

$W = VI t \quad t = \frac{W}{VI}$

$t = \frac{200J}{(9.0V)(0.50A)} = 44s$

(1)

13) $V = 12V$
 $\# = 6.4 \times 10^{19} e$
 every sec

a) $I = ?$ $\circ 6.4 \times 10^{19} e \left(\frac{1.60 \times 10^{-19} C}{1e} \right)$
 $10.2 C$

$\circ I = \frac{q}{t} = \frac{10.2C}{1s} = 10.2 A$

b) $R = ?$

$R = \frac{V}{I} = \frac{12V}{10.2A} = 1.18 \Omega$

(2)

c) $P = ?$ supplied by battery $P = IV = (10.2A)(12V)$

$P = 120 W$

d) $P = ?$ through R $P = I^2 R = (10.2A)^2 (1.17 \Omega)$

$P = 120 W$

47) $l = 100\text{m}$ copper wire $\rho = 1.72 \times 10^{-8} \Omega\text{m}$
 $r = .12\text{m} = .12 \times 10^{-3}\text{m}$
 $V = 1.5\text{V}$

MP uses
 $1.7 \times 10^{-8} \Omega\text{m}$

a) $R = ?$ $R = \frac{\rho L}{A} = \frac{\rho L}{\pi r^2} = \frac{(1.72 \times 10^{-8} \Omega\text{m})(100\text{m})}{\pi (.12 \times 10^{-3}\text{m})^2}$

$R = 38 \Omega \leftarrow 37.6$

(2)

b) $I = ?$ $I = V/R = 1.5\text{V} / 38 \Omega = .039\text{A}$

\uparrow
 $.040$

c) $P = ?$ $P = I^2 R = \frac{V^2}{R} = 1\text{W}$

$= (.039\text{A})(1.5\text{V})$

$= .059\text{W} \leftarrow .060$