HW #2

3-4

$l = 200\ ft \qquad d = \frac{1}{50}\ in = 0{,}02 \qquad T = 20^\circ C$

$0{,}02\ in = 20\ mils \qquad A_{CM} = 20\ mils^2 = 400\ CM$

$$R = \rho \frac{l}{A} = 10{,}37 \cdot \frac{200}{400\ CM} = 5{,}19\ \Omega$$

3-30

a. $1\ W \longrightarrow 2\ W \Rightarrow$ 2 times larger

b. $1/2\ W = 0{,}5\ W \longrightarrow 2\ W \Rightarrow$ 4 times larger

3-34

a. Gray Red Brown Gold

$8 \quad 2 \times 10^1 \pm 5\% \Rightarrow 820\ \Omega \pm 5\% \Rightarrow 779 - 861\ \Omega$

b. Red Red Brown Silver

$2 \quad 2 \times 10^1 \pm 10\% \Rightarrow 220 \pm 10\% \Rightarrow 198\ \Omega - 242\ \Omega$

c. White Brown Orange —

$9 \quad 1 \times 10^3 \pm 20\% \Rightarrow 91\ k\Omega \pm 20\% \Rightarrow 77{,}8 - 109{,}2\ k\Omega$

d. White Brown Red Gold

$9 \quad 1 \times 10^2 \pm 5\% \Rightarrow 9{,}1\ k\Omega \pm 5\% \Rightarrow 8645 - 9555\ \Omega$

e. Orange White Green —

$3 \quad 9 \times 10^5 \pm 20\% \Rightarrow 3{,}9\ M\Omega \pm 20\% \Rightarrow 3{,}12 - 4{,}68\ M\Omega$

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3-35

10% resistors => Last color is silver

a. $68\ \Omega = 68 \times 10^0$ => Blue - Gray - Black - Silver

b. $0{,}33\ \Omega = 33 \times 10^{-2}$ => Orange - Orange - Silver - Silver

c. $22\ K\Omega = 22 \times 10^3$ => Red - Red - Orange - Silver

d. $5{,}6\ M\Omega = 56 \times 10^5$ => Green - Blue - Green - Silver

3-39

a. 621 => $62 \cdot 10^1\ \Omega = 620\ \Omega$

b. 333 => $33 \cdot 10^3\ \Omega = 33\ K\Omega$

c. Q2 => $3{,}9 \cdot 10^2\ \Omega = 390\ \Omega$

d. C6 => $1{,}2 \cdot 10^6\ \Omega = 1{,}2\ M\Omega$

4-9

$I = 4{,}2\ A$

$V = 120\ V$

R?

$V = I \cdot R \qquad R = \frac{V}{I} = \frac{120\ V}{4{,}2\ A} = 28{,}6\ \Omega$

4-11

$I = 20\ \mu A$

$V = 24\ mV$

R?

$V = I \cdot R \qquad R = \frac{V}{I} = \frac{24 \cdot 10^{-3}\ V}{20 \cdot 10^{-6}\ A} = 1200\ \Omega = 1{,}2\ K\Omega$

4-13

$I = 9{,}5\ A$

$V = 120\ V$

a) R? $\quad V = I \cdot R$

$R = \frac{V}{I} = \frac{120\ V}{9{,}5\ A} = 12{,}6\ \Omega$

b) W? $\quad t = 2$ hours/day

$W = P \cdot t = V \cdot I \cdot t$

$W = (120\ V)(9{,}5\ A)(7200\ s) = 8{,}21\ MJ$

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