Chapter 26 - Direct-Current Circuits

Physics 207

1. $I_4 = \dfrac{V_1 + V_2}{R_4}$

$I_3 = \dfrac{V_1 + V_2}{R_3}$

$I = \dfrac{V_2}{R_1 + R_2}$

2a. $t = (R_1 + R_2)(C_1 + C_2)\ln(3)$

2b. $I(t) = \dfrac{1}{3}\dfrac{V_0}{R_1 + R_2}$

3. $X = \dfrac{PM}{N}$

4.

Resistor	Value
R_1	11.48 Ω
R_2	28.25 Ω
R_3	14.025 Ω
R_4	19.13 Ω
R_5	9.20 Ω

Current	Value	Left/Right
I_a	22 A	Left
I_b	12 A	Left
I_c	8 A	Left
I_d	4 A	Right
I_e	6 A	Left
I_f	0 A	Neither
I_g	4 A	Left
I_h	18 A	Right
I_i	12 A	Right

5.

Resistor	Current (mA)
25 Ω	160
50 Ω	160
100 Ω	100
60 Ω	33.3
30 Ω	66.7
90 Ω	0
Battery	260

6a. 5 currents

6b. $I_2 + I_7 = I_8$

$I_5 + I_6 = I_2$

$0 = +4I_8 + 9I_7 - 7 - 8$

$0 = +2I_2 - 2 - 6 + 7I_6 + 7 - 9I_7$

$0 = -7I_6 + 6 + 3I_5 - 5 + 5I_5$

Other Possible Answers:

$I_5 + I_6 + I_7 = I_8$

$0 = 4I_8 + 2I_2 - 2 - 6 + 7I_6 - 8$

$0 = 4I_8 + 2I_2 - 2 + 3I_5 - 5 + 5I_5 - 8$

$0 = 2I_2 - 2 + 3I_5 - 5 + 5I_5 + 7 - 9I_7$