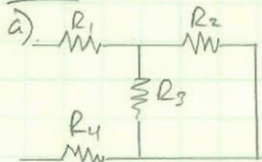


Chap 6 (2, 5, 9, 13, 17, 19b)

6-2

RECD: DETERMINE RESISTORS IN SERIES & PARALLEL.

SOLN:

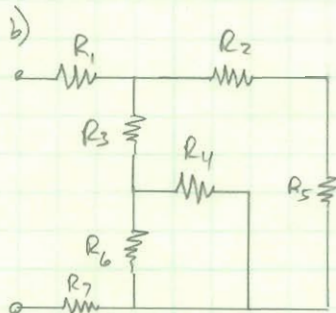


SERIES $R_1 + R_2$

PARALLEL: $R_3 // R_4$

↑ THIS MEANS SERIES

↑ THIS MEANS PARALLEL

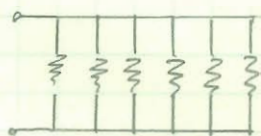


SERIES $R_1 + R_2$

PARALLEL $R_4 // R_6$

$R_2 + R_5$

c)

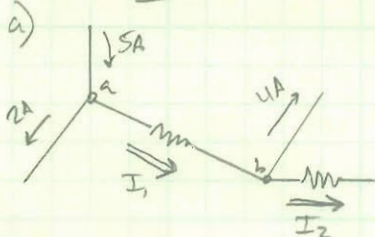


ALL IN PARALLEL $R_1 // R_2 // R_3 // R_4 // R_5 // R_6$

6-5

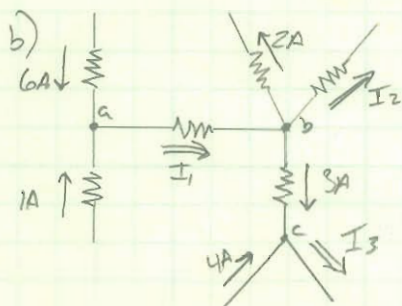
RECD: USE KCL TO FIND UNKNOWN CURRENTS (MAGNITUDE & DIRECTION)

SOLN NOTE: MUST DRAWN UNKNOWN CURRENT ASSUMED DIRECTION AROUND:



KCL @ $\rightarrow \sum I = 0 \quad 5 - 2 - I_1 = 0 \rightarrow I_1 = 3A$

KCL @ $\rightarrow \sum I = 0 \quad 3 - 4 - I_2 = 0 \rightarrow I_2 = -1A$

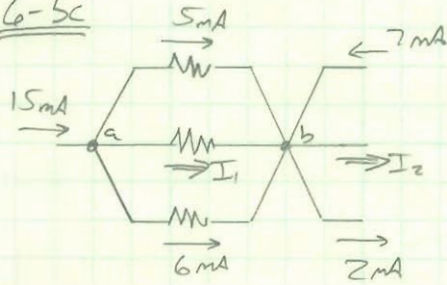


KCL @ $\rightarrow 6 + 1 - I_1 = 0 \rightarrow I_1 = 7A$

KCL @ $\rightarrow 7 - 2 - I_2 - 3 = 0 \rightarrow I_2 = 2A$

KCL @ $\rightarrow 3 + 4 - I_3 = 0 \rightarrow I_3 = 7A$

6-5c

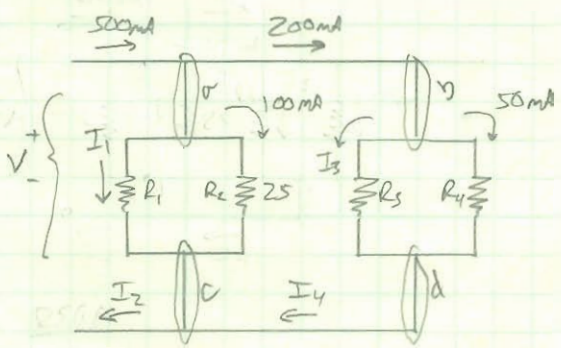


KCL (a) $\rightarrow 15 - 5 - I_1 - 6 = 0 \rightarrow \boxed{I_1 = 4 \text{ mA}}$

KCL (b) $\rightarrow 5 + 4 + 6 + 7 - I_2 - 2 = 0$
 $\rightarrow \boxed{I_2 = 24 \text{ mA}}$

6-9

GIVEN



READ

- (a) KCL FOR I_1, I_2, I_3, I_4
- (b) SOLVE FOR V
- (c) FIND R_1, R_3, R_4

SOLN

(a) KCL (a) $\rightarrow 500 - 200 - I_1 - 100 = 0 \rightarrow \boxed{I_1 = 200 \text{ mA}}$

KCL (b) $\rightarrow 200 - 50 - I_3 = 0 \rightarrow \boxed{I_3 = 150 \text{ mA}}$

KCL (c) $\rightarrow 50 + 150 - I_4 = 0 \rightarrow \boxed{I_4 = 200 \text{ mA}}$

KCL (d) $\rightarrow 200 + 100 + 200 - I_2 = 0 \rightarrow \boxed{I_2 = 500 \text{ mA}}$

(b) $V = IR = (0.1 \text{ A}) 25 \Omega = \boxed{2.5 \text{ V} = V}$

(c) $R_1 = \frac{V_1}{I_1} = \frac{2.5 \text{ V}}{0.2 \text{ A}} = \boxed{12.5 \Omega = R_1}$

$R_3 = \frac{V_3}{I_3} = \left(\frac{2.5 \text{ V}}{0.15 \text{ A}} \right) = \boxed{16.7 \Omega = R_3}$

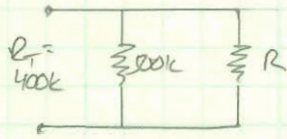
$R_4 = \frac{V_4}{I} = \left(\frac{2.5 \text{ V}}{0.05 \text{ A}} \right) = \boxed{50 \Omega = R_4}$

6-13

REQD: DETERMINE UNKNOWN R

SOLN

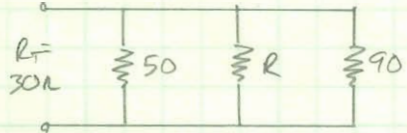
a)



$$\frac{1}{400k} = \frac{1}{500k} + \frac{1}{R} \Rightarrow \frac{1}{R} = \frac{1}{400k} - \frac{1}{500k} = 5 \times 10^{-7}$$

$$R = \frac{1}{5 \times 10^{-7}} = 2 \times 10^6 \Omega = \boxed{2M\Omega = R}$$

b)



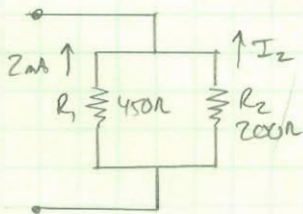
$$\frac{1}{30} = \frac{1}{50} + \frac{1}{R} + \frac{1}{90}$$

$$\frac{1}{R} = \frac{1}{30} - \frac{1}{50} - \frac{1}{90} = 2.22 \times 10^{-3}$$

$$R = \frac{1}{2.22 \times 10^{-3}} = \boxed{450\Omega = R}$$

6-17

GIVEN



REQD

- a) VOLTAGES ACROSS R_1 R_2
- b) CURRENT I_2

SOLN

$$V_1 = I_1 R_1 = (0.002A) 450\Omega = 0.9V = \boxed{900mV = V_1 = V_2}$$

$$I_2 = \frac{V_2}{R_2} = \frac{0.9V}{200\Omega} = 0.0045 = \boxed{4.5mA = I_2}$$

6-19b

GIVEN



REQD: R_T

$$SOLN \quad R_T = 27k\Omega // 33k\Omega // 56k\Omega // 47k\Omega = \boxed{9.59k\Omega = R_T}$$