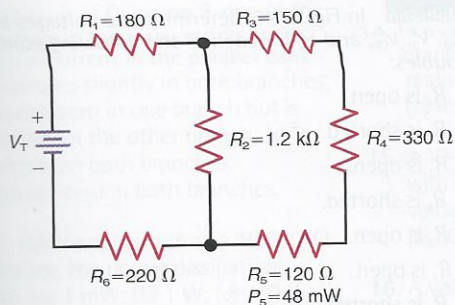


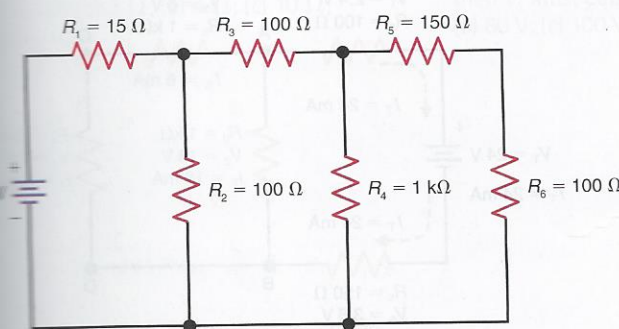
- 6-31 In Fig. 6-41, solve for R_T , I_T , V_1 , V_2 , V_3 , V_4 , V_5 , V_6 , I_1 , I_2 , I_3 , I_4 , and I_5 .

Figure 6-41



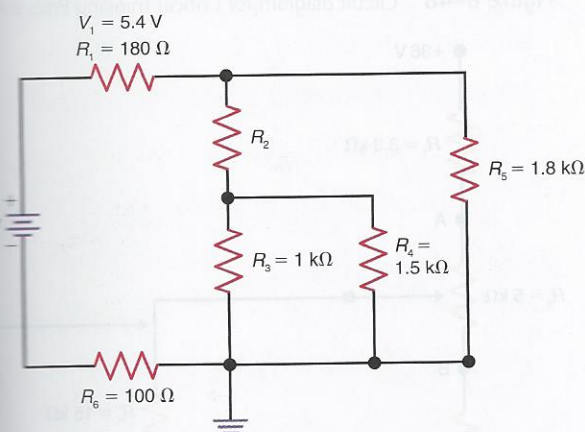
- 6-32 In Fig. 6-42, solve for R_T , I_T , V_1 , V_2 , V_3 , V_4 , V_5 , V_6 , I_1 , I_2 , I_3 , I_4 , I_5 , and I_6 .

Figure 6-42



- 6-33 In Fig. 6-43, solve for I_T , R_T , V_1 , V_2 , V_3 , V_4 , V_5 , V_6 , I_1 , I_2 , I_3 , I_4 , I_5 , and I_6 .

Figure 6-43



SECTION 6-6 THE WHEATSTONE BRIDGE

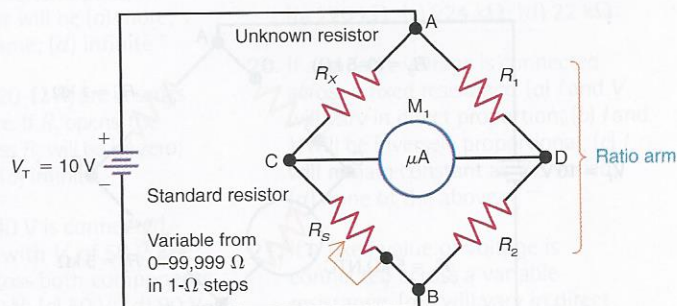
Probs. 34–38 refer to Fig. 6-44.

- 6-34 In Fig. 6-44,

- How much current flows through M_1 when the Wheatstone bridge is balanced?

- How much voltage exists between points C and D when the bridge is balanced?

Figure 6-44



- 6-35 In Fig. 6-44, assume that the bridge is balanced when $R_1 = 1 \text{ k}\Omega$, $R_2 = 5 \text{ k}\Omega$, and $R_s = 34,080 \Omega$. Determine

- the value of the unknown resistor, R_x .
- the voltages V_{CB} and V_{DB} .
- the total current, I_T , flowing to and from the voltage source, V_T .

- 6-36 In reference to Prob. 6-35, which direction (C to D or D to C) will electrons flow through M_1 if

- R_s is reduced in value?
- R_s is increased in value?

- 6-37 In Fig. 6-44, calculate the maximum unknown resistor, $R_{x(\max)}$, that can be measured for the following ratio arm values:

- $\frac{R_1}{R_2} = \frac{1}{1000}$
- $\frac{R_1}{R_2} = \frac{1}{100}$
- $\frac{R_1}{R_2} = \frac{1}{10}$
- $\frac{R_1}{R_2} = \frac{1}{1}$
- $\frac{R_1}{R_2} = \frac{10}{1}$
- $\frac{R_1}{R_2} = \frac{100}{1}$

- 6-38 Assume that the same unknown resistor, R_x , is measured using different ratio arm fractions in Fig. 6-44. In each case, the standard resistor, R_s , is adjusted to provide the balanced condition. The values for each measurement are

- $R_s = 123 \Omega$ and $\frac{R_1}{R_2} = \frac{1}{1}$.
- $R_s = 1232 \Omega$ and $\frac{R_1}{R_2} = \frac{1}{10}$.
- $R_s = 12,317 \Omega$ and $\frac{R_1}{R_2} = \frac{1}{100}$.

Calculate the value of the unknown resistor, R_x , for each measurement. Which ratio arm fraction provides the greatest accuracy?