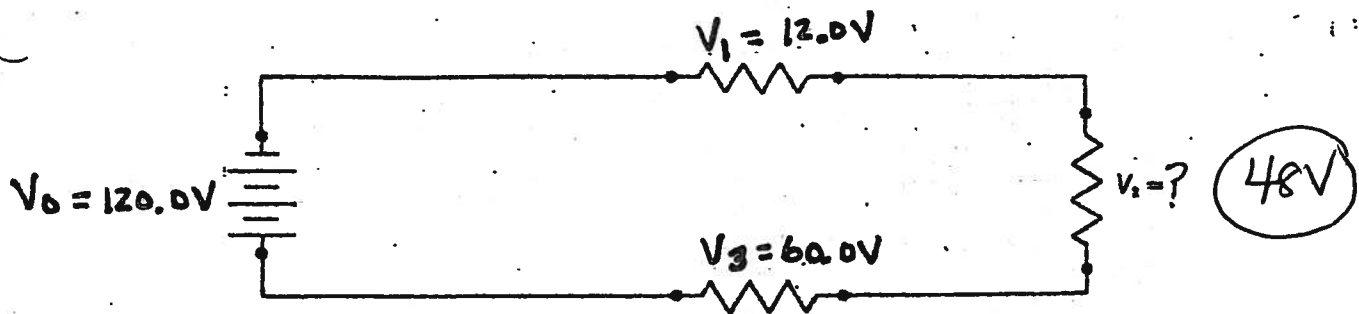ANSWERS

Kirchoff's Laws-Sample Problems
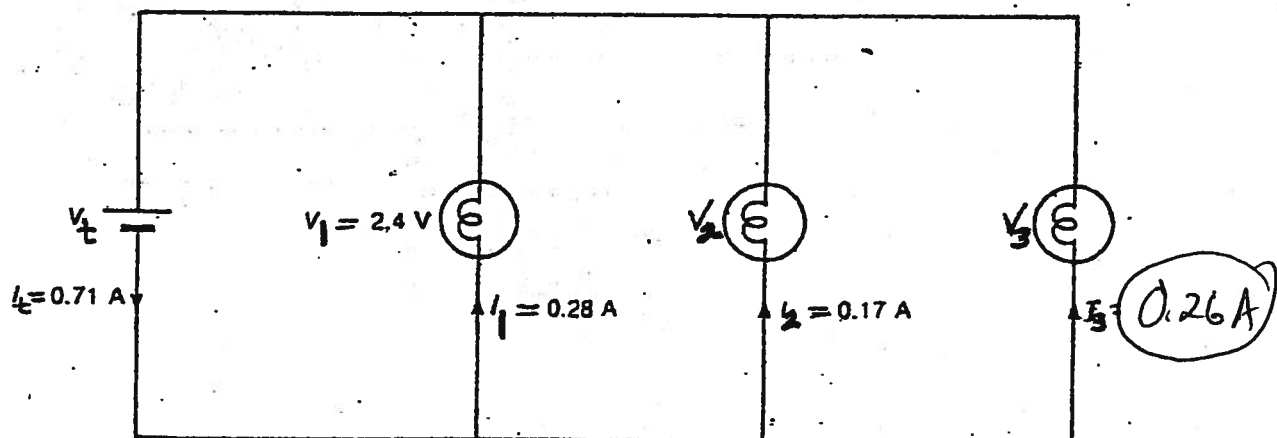
1. Calculate the potential difference, V_2, in this circuit.

$V_1 = 12.0V$

$V_0 = 120.0V$

$V_3 = 60.0V$

$V_2 = ?$ (48V)

2. Calculate the electric current, I_3, in this circuit.

$I_0 = 2.00A$

$I_1 = 0.30 A$

$I_2 = 1.10 A$

$I_3 = ?$ (0.6A)
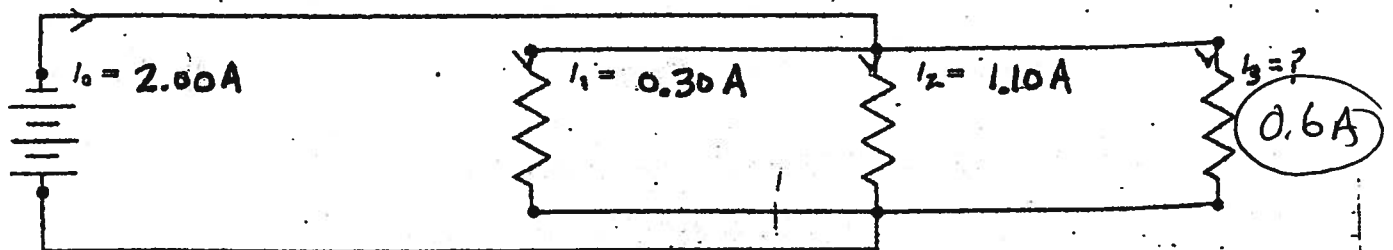
3. a) Determine the unknown quantities V_t, V_2, V_3 and I_3.
   b) Are the three bulbs identical?

V_t

$I_t = 0.71 A$

$V_1 = 2.4 V$

$I_1 = 0.28 A$

V_2

$I_2 = 0.17 A$

V_3

I_3 (0.26A)

4. Determine the unknown quantities, V_1; V_3, I_2, I_1

$I_3 = 210$ mA

V_3

I_2

I_1 $V_2 = 1.8$ V

V_1 $I_t = 570$ mA

L_1

$V_t = 4.2$ V.
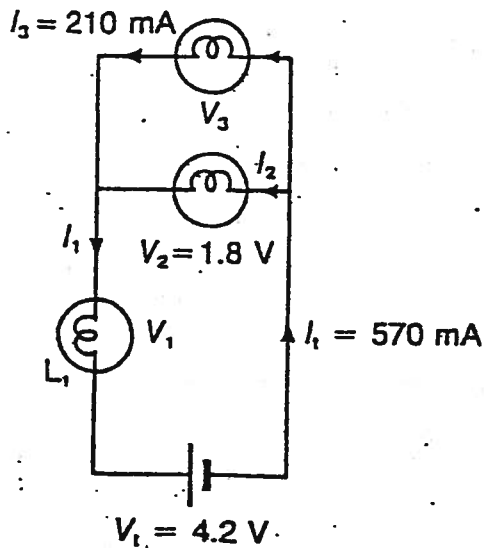
$V_3 = 1.8$ V   ($V_2 = V_3$ in parallel)

$V_1 = 2.4$ V $\left(V_T = V_{2/3} + V_1\right)$

$I_2 = 360$ mA $(I_2 = I_t - I_3)$

$I_1 = 570$ mA $(I_1 = I_t)$

5. Find V1, V3, V4, I1, I3 and I5 in the circuit below.

Vt= 24.0V   V1

I1

V2=6.0 V   V3

V5=3.0V

It= 220 mA

I5   I2= 70 mA   I3

I4= 130 mA   V4
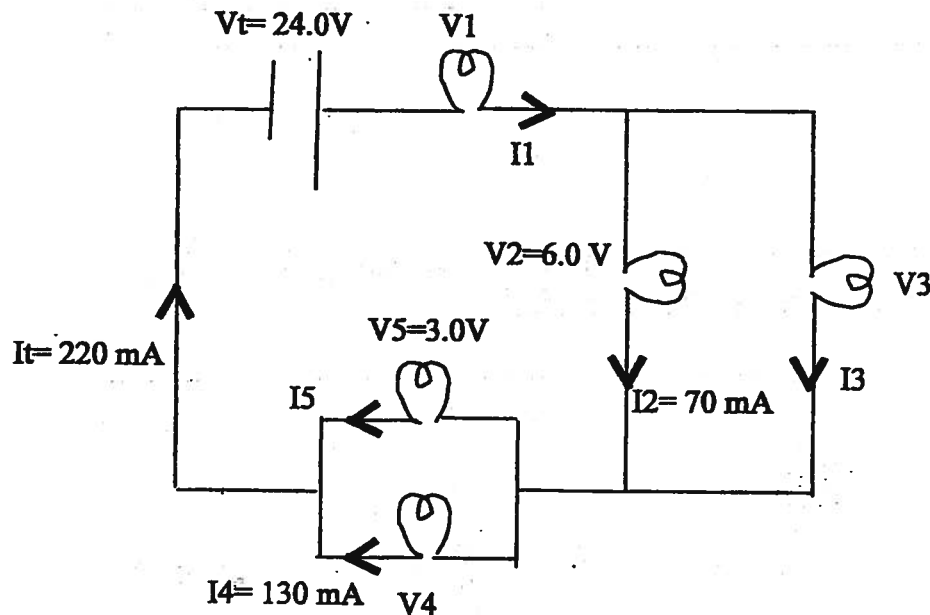
$V_3 = V_2 = 6.0$ V   (in parallel)

$V_4 = V_5 = 3.0$ V   (in parallel)

$V_1 = 15.0$ V $\left(V_t = V_1 + V_{2/3} + V_{4/5}\right)$

$I_1 = 220$ mA $= I_t$ $I_3 = I_1 - I_2$ $I_5 = I_t - I_4$