Eletronica 1

Questão 1:

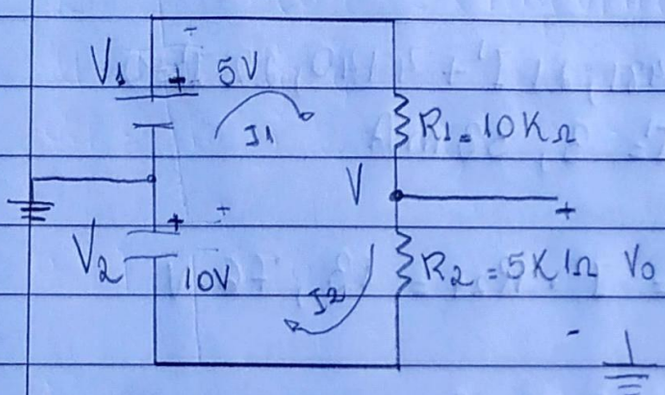
a) $-12 - 12 + V_o = 0$

$V_o = 24\ V$

b) $+8 - 12 + V_o = 0$

$V_o = 4\ V$

2)



$I_1 = \frac{V - 5}{10 \times 10^{+3}} = -6,63\ e\text{-}4\ A$

$I_2 = \frac{V + 10}{5100} = 2,93\ mA$

$$\frac{V - 5}{10 \times 10^{3}} + \frac{V + 10}{5K1} = 0$$

$$\frac{5100(V-5) + 10 \times 10^{3}(V+10)}{510 \times 10^{3}} = \frac{0}{510 \times 10^{3}}$$

$5100V - 25500 + 10000V + 100000 = 0$

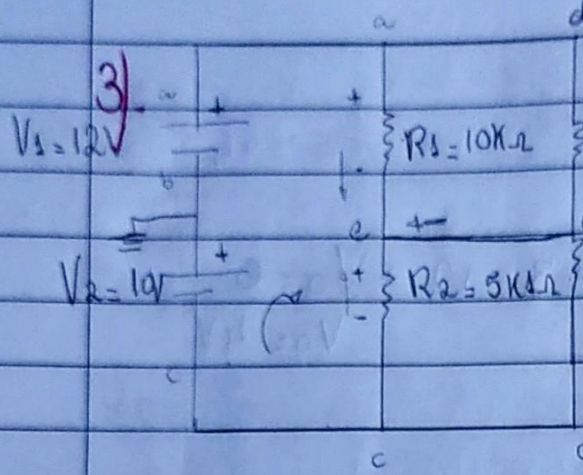
$15100V = -74500$

$V = -4,94\ V$

$V_o = V_{th}$

$R_{th} = R_1 \,//\, R_2 = 3377,49\ \Omega$

3)



$R_{13} = 2481,21\ \Omega$

$R_{24} = 4140,22\ \Omega$

$-10 - 12 + 2481,21\, I' + 4140,22\, I' = 0$

$I' = 3,33\ mA$

$V_{13} = I' \cdot R_{13} = 8,24\ V$ $\quad V_{24} = I' \cdot R_{24} = 13,76\ V$

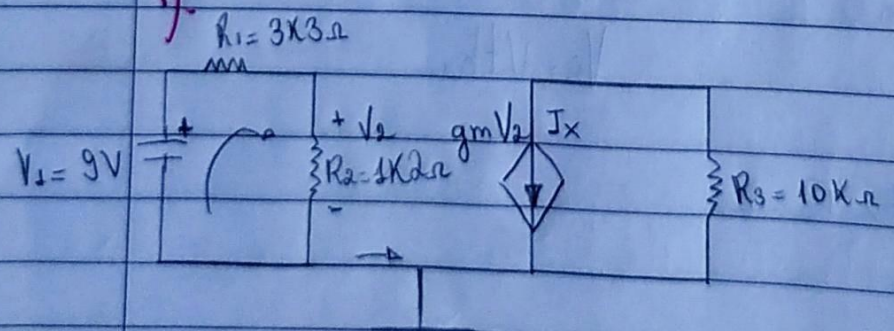
$I_1 = \frac{V_{13}}{R_1} = 0,8244\ mA$ $\quad I_2 = \frac{V_{24}}{R_2} = 2,7\ mA$

$\sum I_e = \sum I_s$

$I_1 + I = I_2$

$\boxed{I = 1,87\ mA}$

4)



$-9 + 3300\, I + 1200\, I = 0$

$I = 2\ mA$

$V_2 = I \cdot R_2$

$V_2 = 2,4\ V$

$I_x = gm\, V_2$

$I_x = 10 \times 10^{-3} \cdot 2,4$

$I_x = 24\ mA$

$V_3 = I_x \cdot R_3$

$V_3 = 24 \times 10^{-3} \cdot 10 \times 10^{3}$

$V_3 = 240\ V$