① a) $P = U_0 I \Rightarrow \frac{U_0^2}{R}$

$U_0 = \sqrt{P R} = \sqrt{10W \cdot 1000\Omega} = 100V$

v: velger å bruke formelen for effekt da vi ønsker å finne spenningen over en pære.

b) 1. sant
2. usant
3. usant
4. usant
5. usant
6. sant

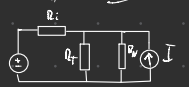
c) $R_p = \frac{1000\Omega}{10} = 100\Omega$

$I_p = \frac{100V}{100\Omega} = 1A$

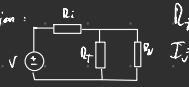
d) $R_T = \frac{1000\Omega}{69} = 14,5\Omega$

$I_T = \frac{100V}{14,5\Omega} = 6,9A$

e)

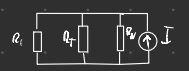


Superposisjon:



$R_{tot} = R_i + \frac{R_T \cdot R_V}{R_T + R_V} = 1\Omega + \frac{14,5\Omega \cdot 100\Omega}{14,5\Omega + 100\Omega} = 13,7\Omega$

$I_i = \frac{V}{R_{tot}} = \frac{98V}{13,7\Omega} = 7,15A$



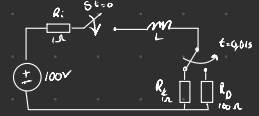
$I_{tot} = 1A \quad I_i = 7,15A + 1A = 8,15A$

$V_{tot} = I R = 8,15A \cdot 1\Omega = 8,15V$

$R_{tot_1} = \frac{1 \cdot 13,7\Omega}{1+13,7\Omega} = 0,93\Omega$

$I = \frac{8,15V}{0,93\Omega} = 8,8A$

f)



$t = 0 \rightarrow 0,01$

$i(0) = 0A$

$i(\infty) = \frac{100V}{2\Omega} = 50A$

$i(t) = 50 - 50e^{-\frac{2}{L}t}\,mA$

$50 - 50e^{-\frac{2}{L}} = 1$

$-\frac{2}{L} = \ln\left(\frac{49}{50}\right)$

$L = -\frac{2 \cdot 0,001}{\ln\left(\frac{49}{50}\right)} = 0,99H$

② a)

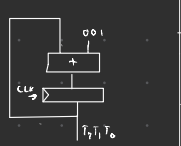
T_2	T_1	T_0	ADD	DE	E	B
0	0	0	1	0	0	1
0	0	1	0	1	0	1
0	1	0	0	0	1	1
0	1	1	0	0	0	1
1	0	0	1	1	1	1
1	0	1	0	0	0	1
1	1	0	1	1	1	1
1	1	1	0	0	0	1

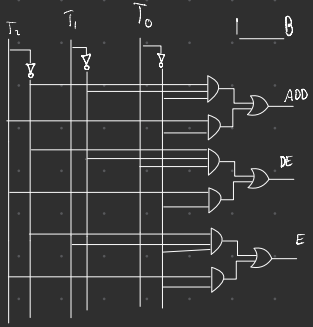
$ADD = \bar{T}_2\bar{T}_1\bar{T}_0 + T_2\bar{T}_1\bar{T}_0 + T_2T_1\bar{T}_0 = \bar{T}_2\bar{T}_1\bar{T}_0 + T_2\bar{T}_0$

$DE = \bar{T}_2T_1\bar{T}_0 + T_2\bar{T}_1\bar{T}_0 + T_2T_1\bar{T}_0 = \bar{T}_1\bar{T}_0 + T_2\bar{T}_0$

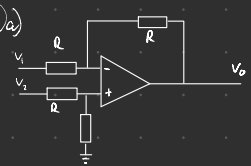
$E = \bar{T}_1T_1\bar{T}_0 + T_2\bar{T}_1\bar{T}_0 + T_2T_1\bar{T}_0 = \bar{T}_2T_1\bar{T}_0 + T_2\bar{T}_0$

$B = 1$





③ a)



$i_{R_1} = \frac{V_1 - V_-}{R}$

$i_{R_2} = \frac{V_- - V_0}{R}$

$V_- = V_+ = I_2 \cdot R$

$I_2 = \frac{V_2}{R+R}$

$V_- = \frac{V_2}{R+R} \cdot R = \frac{V_2}{2}$

$i_1 = i_2$

$V_1 - \frac{V_2}{2} = \frac{V_2}{2} - V_0$

$V_0 = V_2 - V_1$