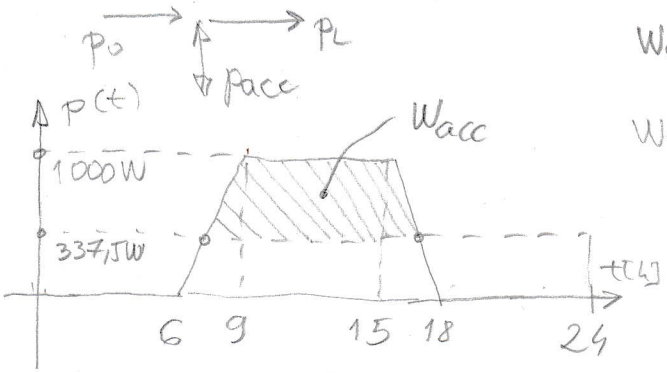
TE - 20180905

1

$$W_0 = 0{,}9 \int_{6h}^{18h} p(t)\,dt = 0{,}9\left(3h \cdot 1000W \cdot \tfrac{1}{2} + 6h \cdot 1000W + 3h \cdot 1000W \cdot \tfrac{1}{2}\right)$$

$$= 0{,}9 \cdot 9\,kWh = \underline{8{,}1\,kWh}.$$

$$P_L = \frac{W_0}{24h} = \frac{8{,}1 \cdot 10^3}{24} = \underline{337{,}5\,W}$$



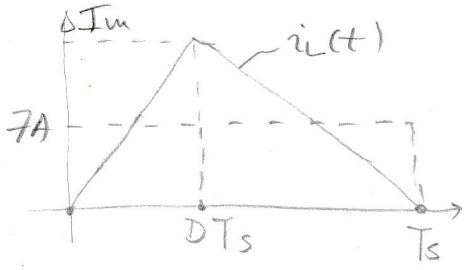
$$W_{acc} = \frac{1000 - 337{,}5}{1000} \cdot 3 \cdot \frac{1}{2} \cdot 2 + (1000 - 337{,}5) \cdot 6$$

$$W_{acc} = 1987{,}5 + 3975 = \underline{5962{,}5\,Wh}$$

$$Q = \frac{W_{acc}}{24} = \frac{5962{,}5}{24} = \underline{248\,Ah}$$

2

$$U_B = \frac{1}{1-D} U_P \Rightarrow 1 - D = \frac{U_P}{U_B} \Rightarrow D = 1 - \frac{U_P}{U_B} = 1 - \frac{20}{28} = 0{,}2857 \cong 28{,}6\%$$

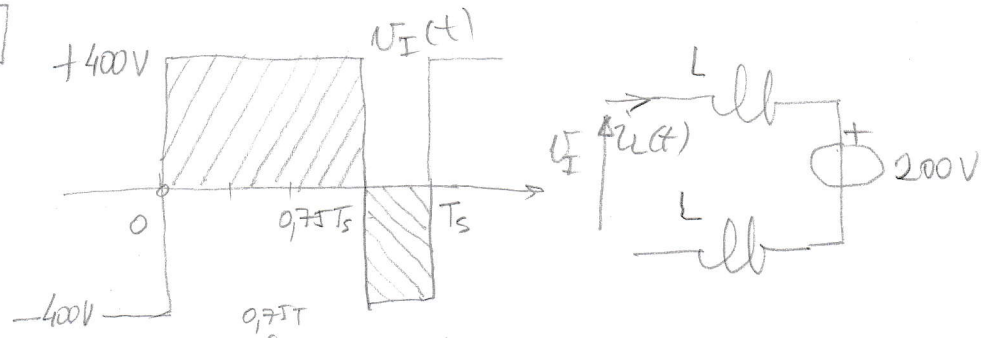


$$7A = \frac{1}{2} I_m \Rightarrow I_m = \underline{14\,A}$$

$$\frac{1}{L} \int_0^{DT_s} v_L(t)\,dt = I_m \Rightarrow \underline{\frac{1}{L} \cdot U_P \cdot DT_s = 14}$$

$$L = \frac{U_P D T_s}{14} = \frac{U_P D}{14 f_s} = \frac{20 \cdot 0{,}2857}{14 \cdot 50 \cdot 10^3} = \underline{8{,}16\,\mu H}$$

3



$$\Delta I_L = \frac{\int v_L(t)\,dt}{L} = \frac{400 - 200}{f_s \cdot 2L} \Rightarrow L = \frac{400 - 200}{2 f_s \Delta I_L}$$

$$L = \frac{200}{2 \cdot 20 \cdot 10^3 \cdot 1} = \underline{5\,mH}$$