

$$\textcircled{1} \quad W_{in} = \int_0^{12h} U_a \cdot I_a \cdot dt = I_a \int_0^{12h} U_a dt = I_a \cdot \bar{U}_{a1} \cdot 12h$$

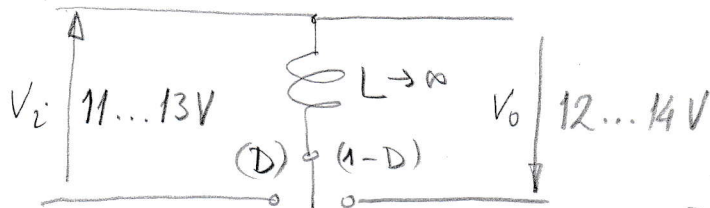
$$W_{in} = 10 \cdot 13 \cdot 12 = \underline{1560 Wh.}$$

$$W_{out} = \int_{12h}^{22h} U_a I_a dt = I_a \int_{12h}^{22h} U_a dt = I_a \cdot \bar{U}_{a2} \cdot 10h$$

$$W_{out} = 10 \cdot 12 \cdot 10 = \underline{1200 Wh.}$$

$$\eta = \frac{W_{out}}{W_{in}} = 0,769 = \underline{76,9\%}$$

②



$$\int_0^T U_L dt = 0$$

$$V_i \cdot D = V_o \cdot (1-D)$$

$$\frac{V_o}{V_i} = \frac{D}{1-D} \quad ;$$

$$D = \frac{V_o}{V_i + V_o}$$

$$\left. \begin{array}{l} V_i' = V_{imin} = 11V \\ V_o = V_{omax} = 14V \end{array} \right\} \Rightarrow D_{max} = \frac{14}{11+14} = 0,56$$

$$\left. \begin{array}{l} V_i' = V_{imax} = 13V \\ V_o = V_{omin} = 12V \end{array} \right\} \Rightarrow D_{max} = \frac{12}{13+12} = 0,48$$

③

$$I_o = 10A$$

$$\left. \begin{array}{l} V_i = V_{imin} = 11V \\ V_o = V_{omax} = 14V \end{array} \right\} D = 0,56$$

$$I_o = I_L \cdot (1-D) \Rightarrow I_L = \frac{10}{0,44} = \underline{22,7A} = I_{Qm} = I_{Dm}$$

$$V_{Qm}, V_{Dm} = ?$$

$$V_{Qm} = V_{imax} + V_{omax} = 13 + 14 = \underline{27V}$$

$$\underline{V_{Dm} = V_{Qm}}$$