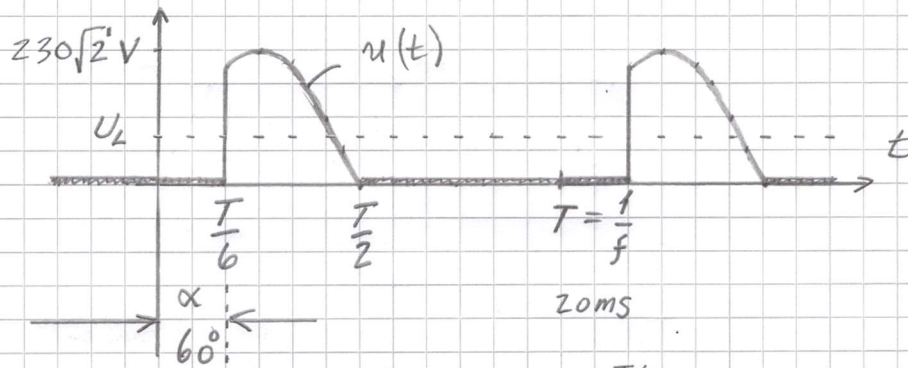
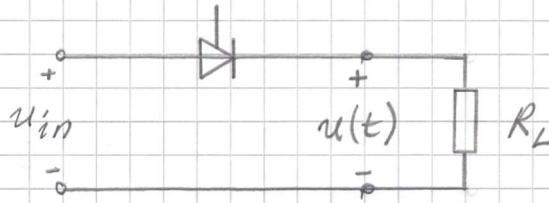


D20 a)

230V
50Hz



$$\begin{aligned}
 U_L &= \frac{1}{T} \int_0^T u(t) dt = \frac{1}{T} \int_{\frac{T}{6}}^{\frac{T}{2}} 230\sqrt{2} \sin(\omega t) dt = \frac{\pi}{\omega} \\
 &= \left| T = \frac{2\pi}{\omega} \right| = \frac{230\sqrt{2} \cancel{\omega}}{2\pi} \left[\frac{-\cos(\omega t)}{\cancel{\omega}} \right]_{\frac{\pi}{3}}^{\pi} = \\
 &= \frac{115\sqrt{2}}{\pi} \left[-\cos \pi + \cos \frac{\pi}{3} \right] \approx \underline{78V}
 \end{aligned}$$

b) $\alpha = 180^\circ \rightarrow U_L = 0$

$$\begin{aligned}
 \alpha = 0^\circ &\Rightarrow U_L = \frac{1}{T} \int_0^{T/2} 230\sqrt{2} \sin(\omega t) dt = \\
 &= \frac{230\sqrt{2} \cancel{\omega}}{2\pi} \left[\frac{-\cos(\omega t)}{\cancel{\omega}} \right]_0^{\frac{\pi}{\omega}} = 104V
 \end{aligned}$$

ALLTSA $\underline{U_L = 0 - 104V}$