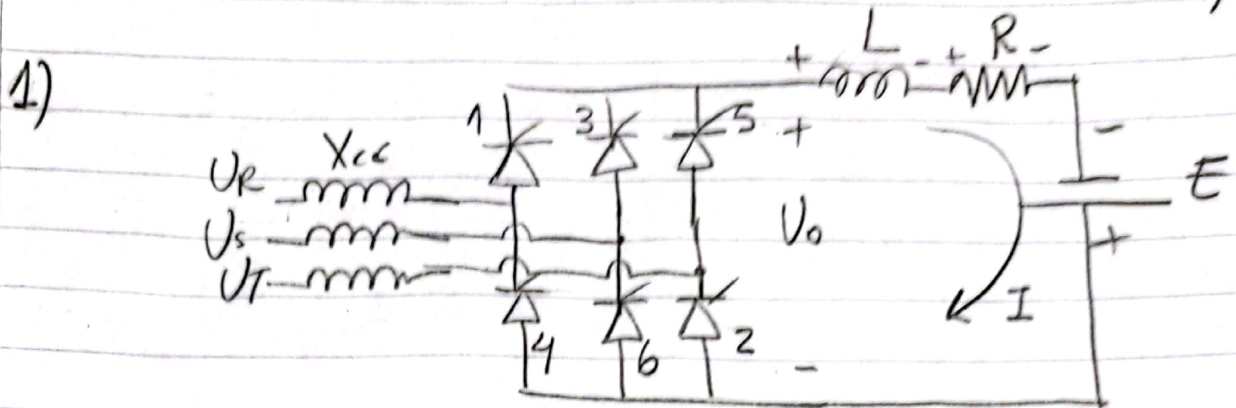


PROBLEMA 1

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2) $t_q = 500 \mu s$

$\omega t = 0$

$\sigma = (2\pi f \cdot t_q) \times \frac{360^\circ}{2\pi} = 9^\circ$

$X_{cc} = x_{cc} \cdot \frac{U^2}{S_N} = 0,15 \cdot \frac{(1,5kV)^2}{10 MVA} = 33,75 \text{ m}\Omega$

$\langle V_0 \rangle = \frac{3\sqrt{2}U \cos(\alpha)}{\pi} - \frac{3X_{cc}I}{\pi} = RI - E$

$\alpha = 117,8^\circ$

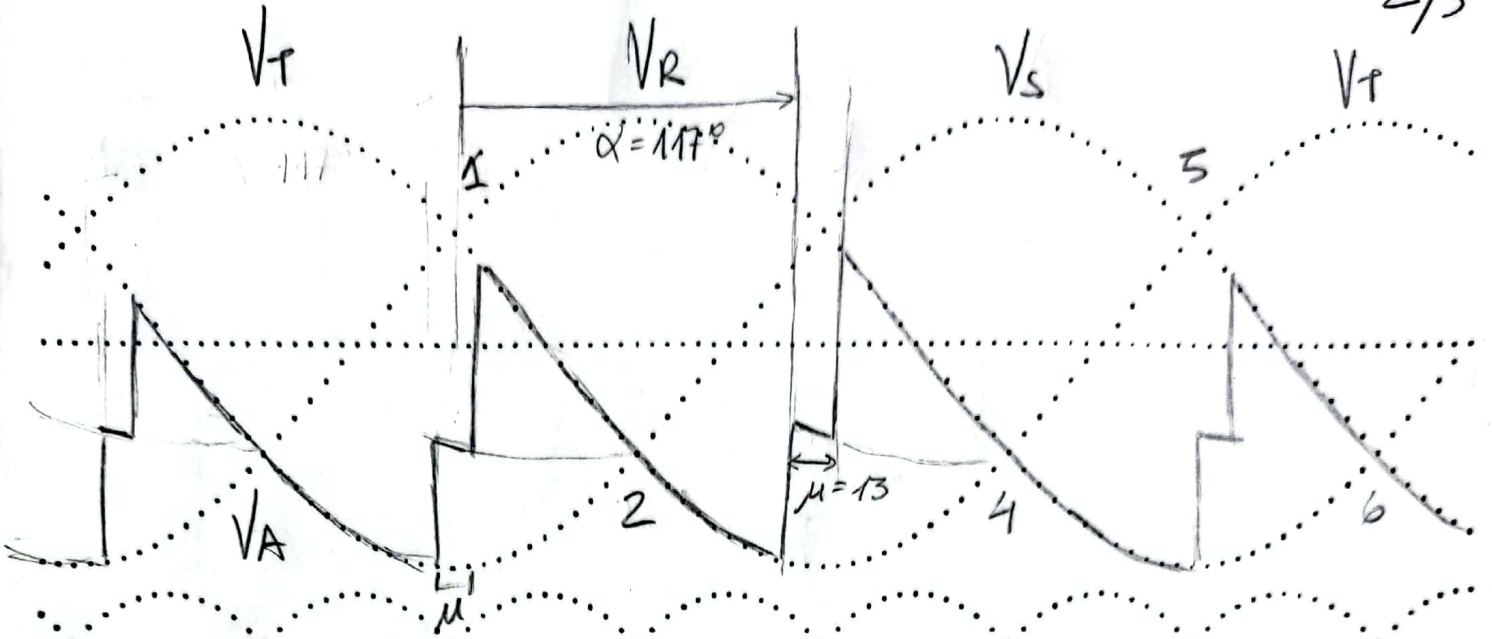
$\mu = \arccos\left(\cos(\alpha) - \frac{2IX_{cc}}{U\sqrt{2}}\right) - \alpha = 13,29^\circ$

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3)

U^* / límite de falla de conmutación
 $\phi = \gamma_{\min} = 9^\circ$

$$-\langle U_0 \rangle = \frac{3\sqrt{2}U^* \cos(\gamma_{\min})}{\pi} - \frac{3X_{cc}I}{\pi} = -PI + E$$

$$U^* = \left(-PI + E + \frac{3X_{cc}I}{\pi} \right) \frac{\pi}{3\sqrt{2} \cos(\gamma_{\min})}$$

$$U^* = 999,6V$$

$$\frac{3\sqrt{2}U^0 \cos(\alpha)}{\pi} - \frac{3X_{cc}I}{\pi} = PI - E$$

$$\rightarrow \alpha = 134,5^\circ$$

$$\gamma = 9^\circ$$

$$\alpha + \mu + \gamma = \pi$$

$$\rightarrow \mu = 36,4^\circ$$

4) Existe una conmutación entre T_1 y T_5
 con $\alpha = 0^\circ$.

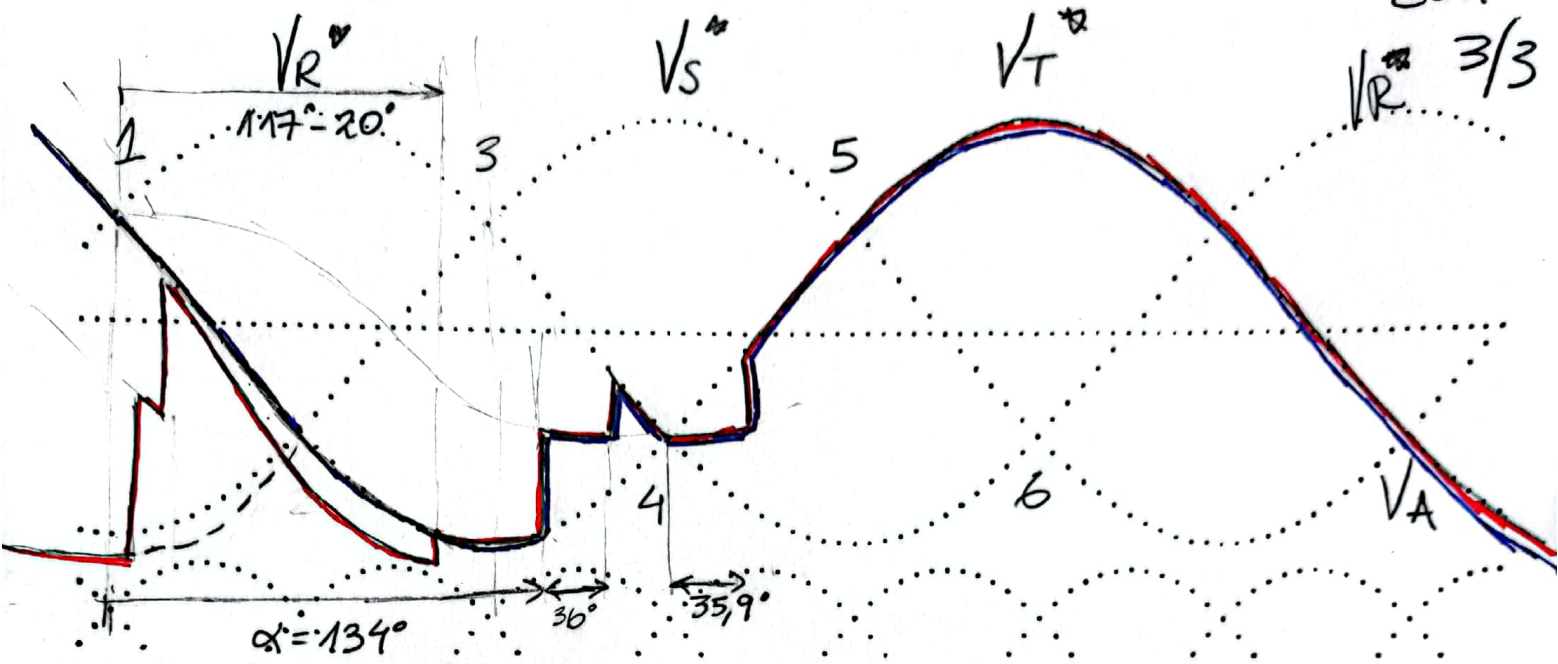
$$\mu = \arccos \left(\cos(0^\circ) - \frac{2IX_{cc}}{U\sqrt{2}} \right) - 0^\circ = 35,9^\circ$$

4)

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$V_R \approx 3/3$



V_A transitorio

V_A régimen