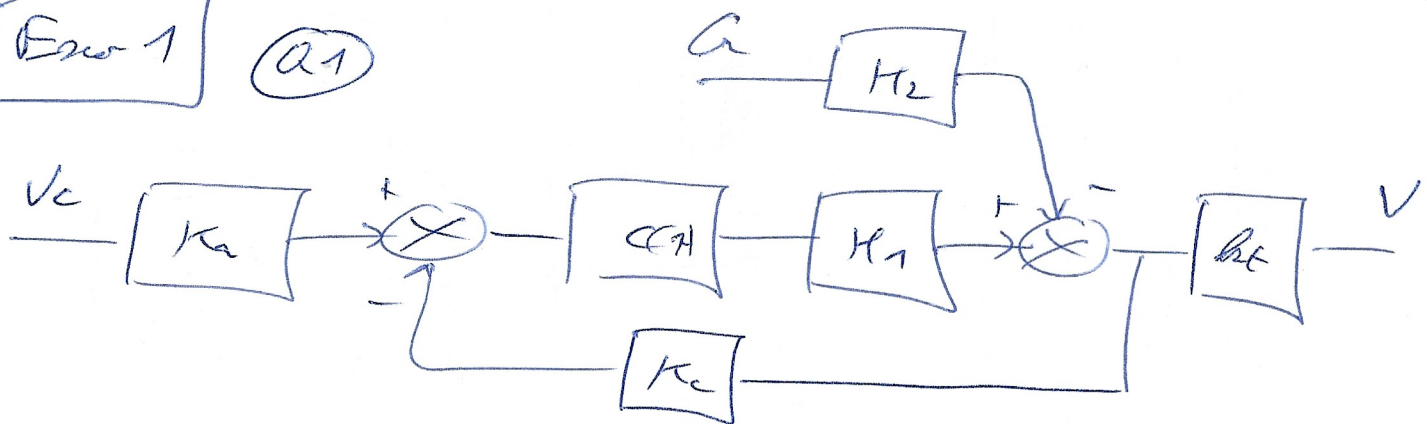
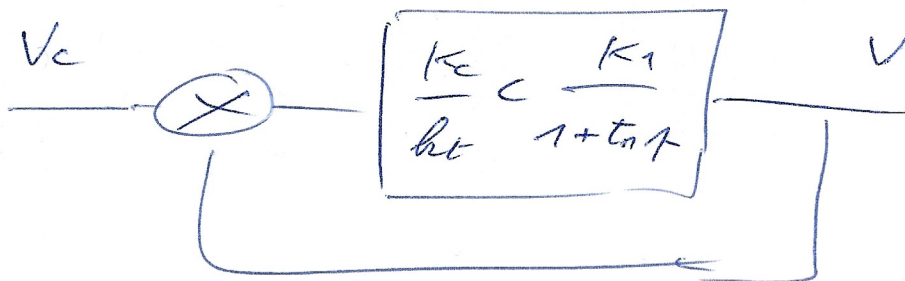


Exercices ordre 1 & 2

Exercice 1 (Q1)



(Q2) $a = 0$ $C(s) = C$ $K_a = \frac{K_c}{h_t}$



(Q3) $FTB_0 = \frac{K_3}{1 + \tau_1 \tau}$ avec $K_3 = \frac{K_c C K_1}{h_t}$

(Q4) $FTBF = \frac{G}{1 + G} = \frac{K_3}{1 + \tau_1 \tau + K_3} = \frac{\frac{K_3}{1 + K_3}}{1 + \frac{\tau_1}{1 + K_3} \tau}$

$FTBF = \frac{K_{BF}}{1 + \tau_{BF} \tau}$

(Q5) Précision : $\varepsilon(\infty) = 1 - \frac{K_3}{1 + K_3} = \frac{1}{1 + K_3}$
(regime à un échelon unitaire)

Rapacité : $t_{sx} = 3 \tau_{BF} = \frac{3 \tau_1}{1 + K_3}$

(Q6) lorsque $C \uparrow$ $\varepsilon(\infty) \downarrow$ et $t_{sx} \downarrow$.

Exo 2

Q1

$$H_2(\tau) = \frac{25c}{\tau(\tau + 0,05\tau) + 25c}$$

Q2

$$H_2(\tau) = \frac{1}{\frac{0,05}{25 \cdot c} \tau^2 + \frac{1}{25 \cdot c} \tau + 1} = \frac{1}{\frac{1}{500 \cdot c} \tau^2 + \frac{1}{25c} \tau + 1}$$

$$K_2 = 1 ; \quad \omega_0 = \sqrt{500c} = 10 \sqrt{5c}$$

$$\frac{2\zeta}{\omega_0} = \frac{1}{25c} \Rightarrow \zeta = \frac{\omega_0}{50 \cdot c} = \frac{1}{\sqrt{5c}}$$

$$Q3 \quad \zeta = 1 \Rightarrow c = \frac{1}{5} = 0,2$$

$$\omega_0 = 10 \Rightarrow t_{sx} = \frac{5}{\omega_0} = 0,2 \text{ s}$$

Q5 Performances :

Stable, pas de dépassement ($\zeta = 1$)
Précis, $K_2 = 1$
Rapacité : $t_{sx} = 0,2 \text{ s}$