

(1)

[Dn PCSI / PASI] SLANT

(Q1)

$$I_2 r^2 \theta_{20}(r) = -k_r (r \theta_{20}(r) - r \theta_{10}(r)) \\ - k_r (\theta_{20}(r) - \theta_{10}(r))$$

$$\frac{\theta_{20}(r)}{\theta_{10}(r)} = \frac{k_r r + k_r}{I_2 r^2 + k_r (r + k_r)} \\ = \frac{1 + \frac{k_r}{I_2} r}{\frac{I_2}{k_r} r^2 + \frac{k_r}{k_r} r + 1}$$

$$K = 1 \quad \omega_0 = \sqrt{\frac{k_r}{I_2}} \quad \frac{2\beta}{\omega_0} = \frac{k_r}{k_r}$$

$$\Rightarrow \beta = \frac{k_r}{2 k_r} \sqrt{\frac{k_r}{I_2}} = \frac{k_r}{2 \sqrt{k_r I_2}}$$

$$(Q2) \beta = 0,7 \Rightarrow \beta = \frac{\sqrt{2}}{2} = \frac{k_r}{2 \sqrt{k_r I_2}} \Rightarrow k_r = \sqrt{2 k_r I_2}$$

(Q4)

$$Q(r) = S r \lambda(r) + \frac{V_0}{2B} r P(r)$$

$$P(r) = \frac{2B}{V_0 r} \left[Q(r) - S r \lambda(r) \right]$$

$$P(r) = \underbrace{\left(\frac{2BS}{V_0} \right)}_{H_2} \left[\underbrace{\left(\frac{1}{S r} \right)}_{H_1} Q(r) - \lambda(r) \right]$$

(Q3)

$$k_r = 16000$$

OK

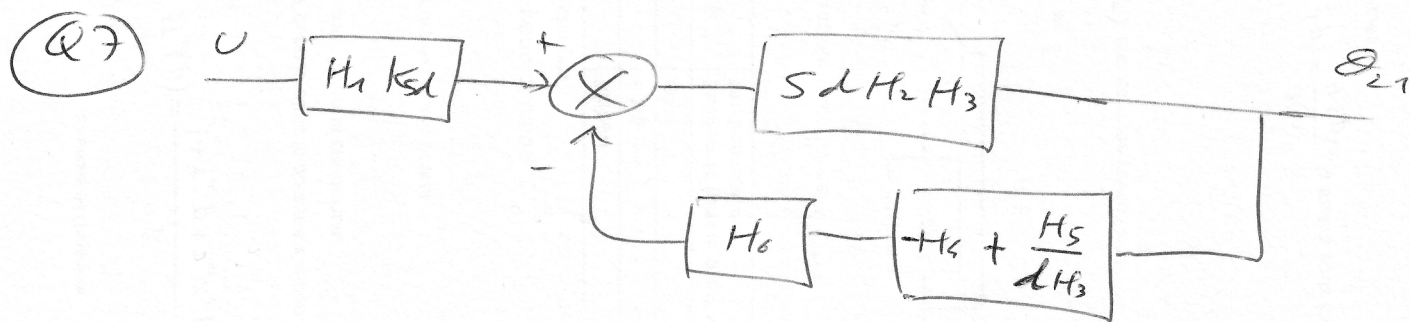
(Q5)

$$I_3 r^2 \theta_{31}(r) + I_2 r^2 \theta_{21}(r) = d \times F(r)$$

$$\mathcal{O}_{31}(T) = -\mathcal{O}_{21}(T) + \frac{\lambda}{I_2 T^2} F(T)$$

$$H_5 = \frac{d}{I_2 r^2}$$

$$(Q6) \quad H_6 = \frac{\lambda}{\theta_{3,1}} = \frac{\Delta \lambda}{\Delta \theta_{3,1}} = \frac{0,05}{0,1} = 0,5 \text{ m}$$



$$F(\tau) = H_1 K_{sd} \frac{S d H_2 H_3}{1 + S d H_2 H_3 H_0 \left(\frac{-d H_4 H_3 + H_5}{d H_2} \right)}$$

$$F(\tau) = \frac{AB \quad S d H_2 H_3 \quad H_1 K_{sd}}{1 + \underbrace{S H_2 H_6}_A \left[H_5 - \underbrace{d H_3 H_5}_B \right]}$$

Q8 $H(z) = \frac{K_c}{z(1+z) + K_c} = \frac{1}{\frac{z^2}{K_c} + \frac{z}{K_c} + 1} \quad | K=1$

$$\omega_0 = \sqrt{K_c} \quad ; \quad K = 7$$

$$\frac{2f}{\omega_0} = \frac{1}{K_c} \Rightarrow f = \frac{1}{2\sqrt{K_c}}$$

$$f = 1 \Rightarrow K_c = \frac{1}{4} = 0,25$$

Perf : Preis $K=1$

$$w_0 = 0.15 \quad t_{5\%} w_0 = 5$$

$$t_{5\%} = \frac{5}{0,5} = 10 \text{ s}$$