

# Example 5.9

Q: deadbeat controller

$$G(s) = \frac{1}{(s+1)(s+10)} \quad T = 0.02 \text{ s}$$

$$\rightarrow T = 0.1 \text{ s}$$

Solution  $G_{zas}(z) = (1-z^{-1})Z\left\{\frac{G(s)}{s}\right\}$

$$= (1-z^{-1})Z\left\{\frac{1}{s(s+1)(s+10)}\right\}$$

$$= 1.8604 \times 10^{-4} \frac{z + 0.9293}{(z - 0.8187)(z - 0.9802)}$$

快速算  
展开死算

no poles and zeros outside or on the unit circle

$$G_c(z) = z^{-1} \quad z^{-1} = 1$$

$$C(z) = \frac{1}{G_{zas}(z)} \left[ \frac{z^{-k}}{1-z^{-k}} \right]$$

$$= \frac{1}{1.8604 \times 10^{-4} \frac{z + 0.9293}{(z - 0.8187)(z - 0.9802)}} \left[ \frac{z^{-1}}{1-z^{-1}} \right]$$

$$= \frac{5375 \cdot \overset{0.533}{\textcircled{1881}} (z - 0.8187)(z - 0.9802)}{(z + 0.9293)(z - 1)}$$

? 精度

$T = 0.02$  un acceptable

So choose  $T = 0.15$