Q2

OS%= 16%

Ts = 12

Damping ratio = -ln(0.16)/ √(π2 + ln(0.16)^2)

= 0.503868

T = 1

z{G(s)} = z{((1-e-st)/s)\*(0.1/s(s+0.1))}

=0.1(1-z-1)\*z{1/s2(s+0.1)}

=0.1((z-1)/z)\*z{100\*1/(s+0.1) – 100\*(1/s) + 10\*(1/s2)}

=0.1((z-1)/z)\*(100\*(z/(z+e-0.1T) – 100\*(z/z-1) + 10\*(z/(z-1)2))

= 10(z-1/z+1.105) + (1/z+1) - 10

A picture containing shape

Description automatically generated

Diagram

Description automatically generated

Root locus of the system

Intercept point = Logo

Description automatically generated with medium confidence