

Control and Automation ExamLewis Christopher19095372Question 4.

$$Q15 = e^{\left(\frac{-\pi\zeta}{\sqrt{1-\zeta^2}}\right)} \times 100$$

$$\ln 0.15 = \frac{-\zeta\pi}{\sqrt{1-\zeta^2}}$$

$$-1.897(\sqrt{1-\zeta^2}) = -\zeta\pi$$

$$3.599(1-\zeta^2) = 9.87\zeta^2$$

$$3.599 = 13.469\zeta^2$$

$$\zeta = 0.517 \text{ for } 15\% \text{ overshoot}$$