9.2 Various Types of Responses: Overdamped

(PP 325 8th Ed HRD)

It should be noted that some basic scenarios may be dependent on the relative size of α and ω_0.

— If $\alpha > \omega_0$ s_1 and s_2 will be real numbers leading to what is reffered as an Overdamped Rezpone.

— In the opposite case if $\alpha < \omega_0$ both s_1 and s_2 will have non-zero imaginary components leading to what is called an Underdamped response.

— The special case of $\alpha = \omega_0$ leads to Critically damped response.

— Important: All of these equations from

$$v(t) = A_1 e^{s_1 t} + A_2 e^{s_2 t}$$ describe not only the voltage but all three branch currents; the constants A_1 and A_2 will be different for each, of course.

— Damping ratio is $\frac{\alpha}{\omega_0} = \zeta$ (zeta)