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Matlab Project

Part 2)

1a)

$$f_c = \frac{1}{2\pi RC}$$

if $f_c = 200$ hz

$$200 = \frac{1}{2\pi \cdot RC}$$

$$RC = \frac{1}{2\pi \cdot 200}$$

Assuming $C = 15 \times 10^{-6}$ F

$$R(15 \times 10^{-6}) = \frac{1}{2\pi (200)}$$

$$R = \frac{1}{2\pi (200)(15 \times 10^{-6})}$$

$$\boxed{\begin{array}{l} R = 53.05 \ \Omega \\ C = 15 \times 10^{-6} \ F \end{array}}$$

Given the pole of an RC circuit is

$$p = -\frac{1}{RC}$$

Given the unit impulse response is

$$H(t) = e^{pt}$$

$$H(t) = e^{-\frac{1}{RC}t}$$

$$H(t) \quad \frac{1}{(53.03)(15 \times 10^{-6})} \cdot e^{\frac{-1}{(53.03)(15 \times 10^{-6})}t}$$