EE301 Nov. 20, 2009

Quiz 9 – No Calculators – pencil (or pen) and paper only

Problem 1:

1. Find the time constant. $2000 \text{sec} = \frac{1}{T} \text{within } 27\% \text{ of final value}$
2. Mark the settling time – showing how you determined it.
3. Mark the rise time – showing how you determined it.

For the second order system:

1. Find the percent overshoot $1.2 - 1 \times 100 = 20\%$
2. Find the time to peak. $2 \text{sec}$
3. Mark the settling time – showing how you determined it. $\pm 27\%$ around final value
4. Mark the rise time – showing how you determined it. $10\%$ to $90\%$ of final value

Problem 2

Filters:

The input to my system is: $v_i(t) = \sin (40t) + \sin (400t) + \sin(4000t) + \sin(400000t)$. Assume ideal behavior. If the desired output is the signal $v_o(t) = \sin (40t) \pm \sin (4000t)$, the filter would need to be:

a) A low pass filter with a cut-off frequency of $\leq 1000 \text{ rad/sec}$

b) A band pass filter with a center frequency of $4000 \text{ rad/sec}$

c) A high pass filter with a center frequency of $\geq 4000 \text{ rad/sec}$

d) A band stop filter with a center frequency of $4000 \text{ rad/sec}$