

Dr. Waheed Ahmad Younis

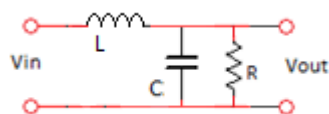
Do not submit this homework. There will be a quiz from this homework on Wednesday (Sep 16, 2021).

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**Topics covered in this week:**

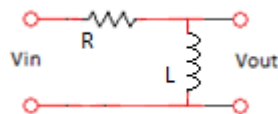
- Frequency response is plotted in dB scale using a semi-log paper.
  - Each RC or LC pair introduces a pole, and each pole contributes a roll-off of 20 dB/decade.
  - At low frequencies (less than 10 MHz), inductor is avoided, and active filters can be used.
  - At high frequencies (above 1 MHz), active devices are avoided, Inductors can be used.
  - While cascading, loading effects has to be considered.
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**Q1.** Find the transfer function for the following circuit:



If  $C=1 \mu\text{F}$ ,  $L=1 \text{ H}$  and  $R=500\Omega$ , sketch the frequency response. What is the roll-off rate? What kind of filter is this?

**Q2.** Find the transfer function of the following circuit:



If  $R=1\text{k}\Omega$  and  $L=1\text{mH}$ , sketch the frequency response. What kind of filter is this?

**Q3.** Find the transfer functions of the following circuits. What kind of filters are they?

