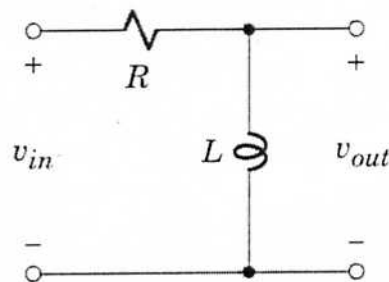


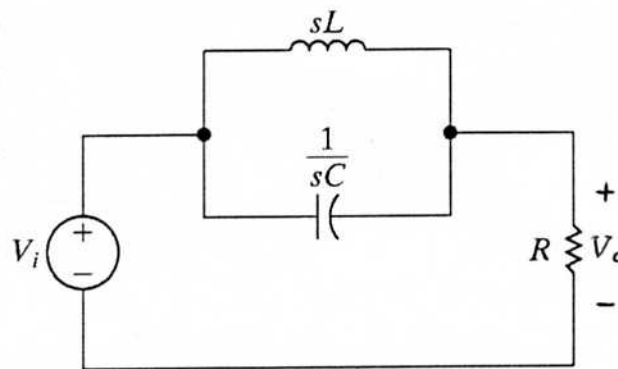
1. For the RL circuit below, $R = 2 \text{ k}\Omega$ and $L = 5 \text{ mH}$.

- What type of filters is this circuit? (5%)
- What is the transfer function, $H(s) = V_{out}(s)/V_{in}(s)$, of this filter? (10%)
- What is the cutoff frequency of this filter? (10%)
- What will be the cutoff frequency of this filter if a load resistor $R_L = 3 \text{ k}\Omega$ is added in parallel with L ? (10%)



2. For the RLC circuit below, $R = 750 \Omega$, $L = 50 \mu\text{H}$, and $C = 20 \text{ nF}$.

- What type of filters is this circuit? (10%)
- What is the transfer function, $H(s) = V_o(s)/V_i(s)$, of this filter? (10%)
- Indicate the three frequencies which characterize this filter. (15%)



3. If the transfer function is

$$H(s) = \frac{100s(s^2 + 10s + 2500)}{(s + 50)^3}$$

Sketch the Bode plot of $g(\omega)$. Make sure to include the asymptotic lines and indicate points with correction terms to construct the Bode plot of $g(\omega)$. (30%)

