EECE 2150 - Circuits and Signals: Biomedical Applications Fall 2023
Quiz 8

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9 November 2023

Student Name: _____

For the filter circuit in the figure, the gain, $A(f)$ varies with frequency, f. The comonent values are $R_1 = R_2 = 1\,\text{k}\Omega$, $C = 318\,\text{pF}$, and $L = 31.8\,\text{mH}$.

1. What is the gain at very low and very high frequencies?

$A(0) =$ _____ . $A(\infty) =$ _____ .

2. Is the gain higher or lower at frequencies in between these extreme values?

☐ Higher ☐ Lower

3. What type of filter is this?

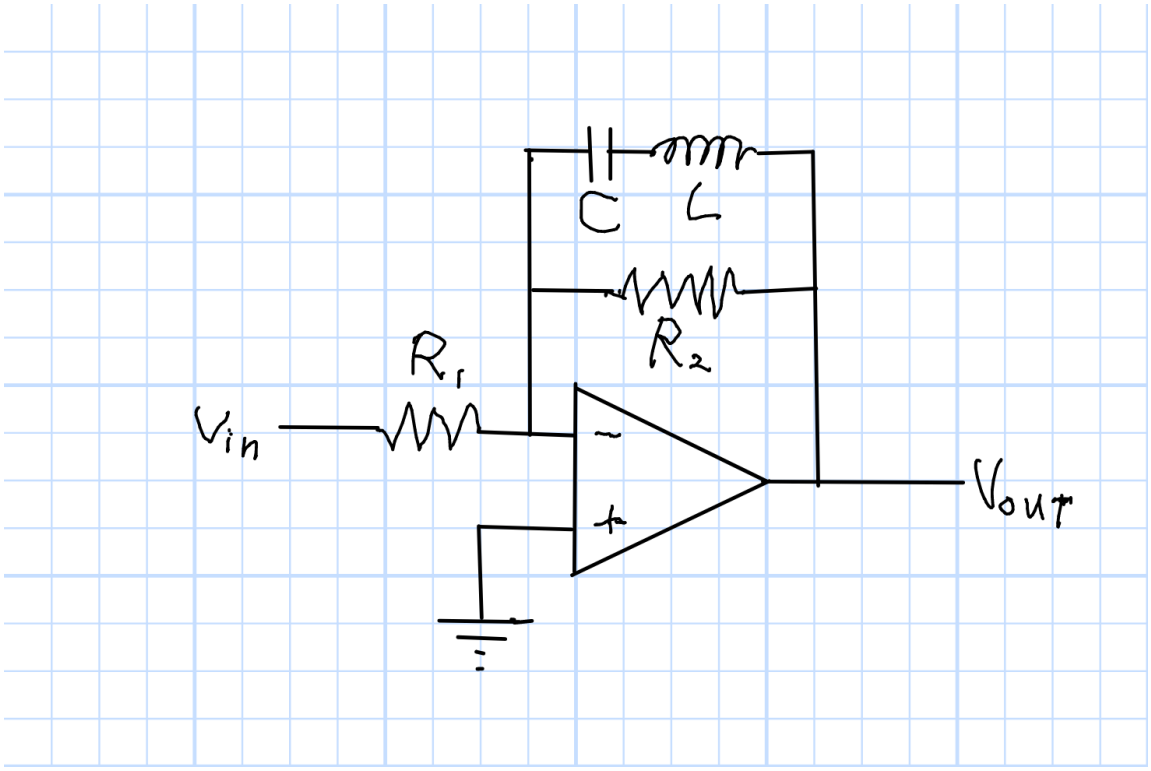
☐ Low Pass ☐ High Pass ☐ Band Pass ☐ Band Stop

4. What is the frequency at which the gain reaches its extreme (maximum or minimum) value?

$f_{center} =$ _____ .

5. What is the gain at this frequency?

$A_v =$ _____ .


C
L
R_2
R_1
V_{in}
V_{out}

Solutions

1. What is the gain at very low and very high frequencies?

$A(0) = -R_2/R_1 = -1$ $A(\infty) = -R_2/R_1 = -1$.

2. Is the gain higher or lower at frequencies in between these extreme values?

× Lower

3. What type of filter is this?

× Band Stop

4. What is the frequency at which the gain reaches its extreme (maximum or minimum) value?

$f_{center} = \frac{1}{2\pi}\sqrt{\frac{1}{LC}} = 50\,\text{kHz}$

5. What is the gain at this frequency?

$A_v = 0$.