ECE 214 — Final Exam

Estimated time for completion: $\ll 2.0$ hour
11 May 2017

Rules of the Exam

Rule 1: The examination period begins at 8:00am on Thursday 11 May 2017 and ends at 10:00am on Thursday 11 May 2017.

Rule 2: The exam is 15% of your grade. There are two questions, each with equal weight. There is one bonus question.

Rule 3: To receive credit, all work must be shown. Answers without supporting work will not receive credit. Make sure to include the units along with the numerical answer.

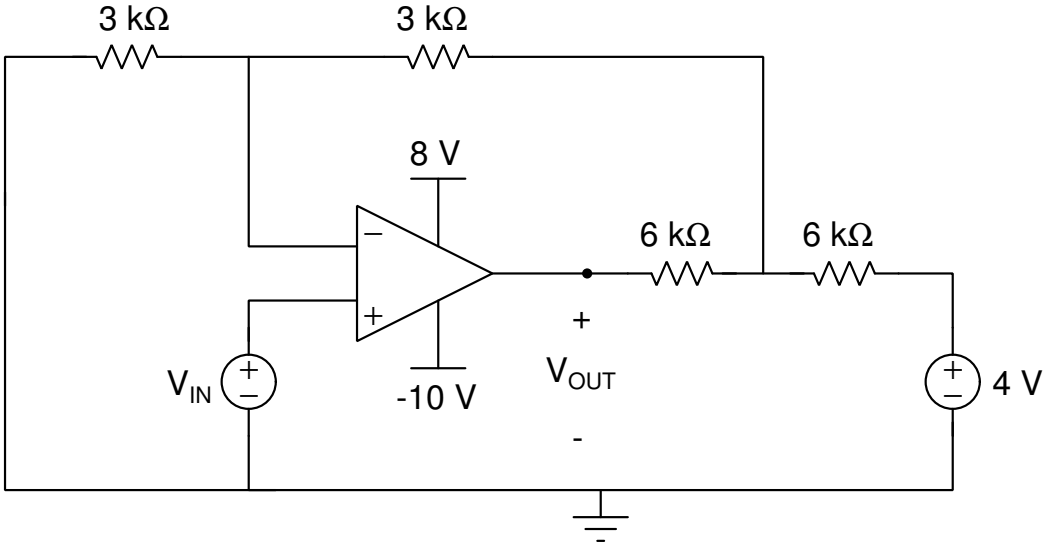
Rule 4: The exam is closed book and closed notes. You may use your ECE 214 Laboratory Notebook and a calculator.

Rule 5: Turn in your ECE 214 Laboratory Notebook with the Final Exam.

_____

Name

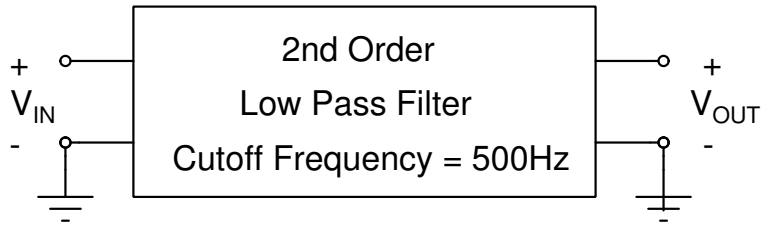
Problem 1: The OpAmp is ideal.



(a) Derive the equation for V_{OUT} as a function of V_{IN}.

(b) What is the maximum value of V_{IN} that will keep the output of the OpAmp (V_{OUT}) from saturating?

Problem 2: Consider a 2nd order ideal low pass filter. The cutoff frequency is 500 Hz. The input (V_{IN}) is a sine wave at frequency f.

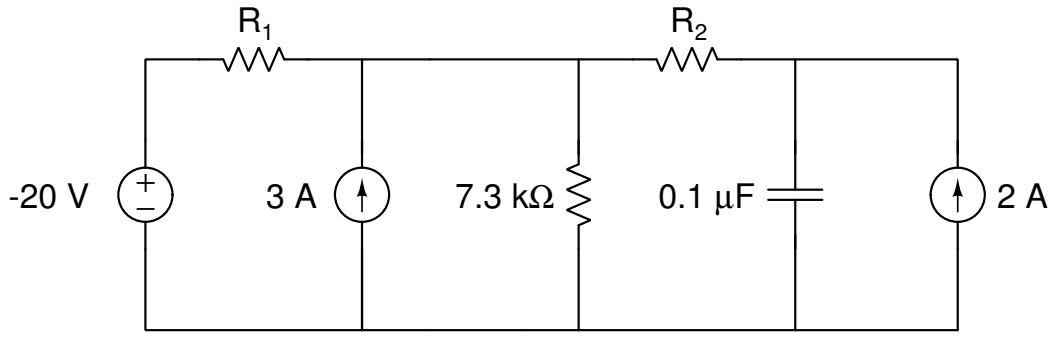


What are the approximate frequencies that correspond to the attenuations listed in the table below?

$\frac{V_{OUT}}{V_{IN}}$	**frequency**
-3 dB	
-6 dB	
-20 dB	
-40 dB	
-60 dB	
-80 dB	

Bonus Question: (5 points)

In the circuit below, the 3A current source delivers no power and absorbs no power. The circuit dissipates a total of 200 W of power.



What is R_1? _____ What is R_2? _____

Name: _____

Name: _____

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