ME 458 Mechatronics
Low-pass Filter Homework

R

v_{in} C v_{out}
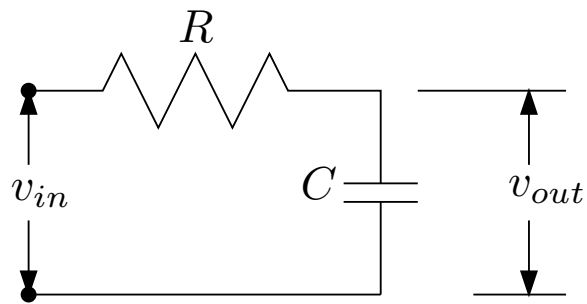
1. Derive the transfer function between v_{out} and v_{in}.

2. What is the corner frequency f_c of this filter if R=1 kΩ and C=10 μF? Be sure to answer in Hz.

3. If v_{in} is a sine wave with amplitude 1.0, what is v_{out} at the following frequencies?

   • 0.5 f_c
   • f_c
   • 10 f_c

   Be sure to include magnitude and phase in your answers.