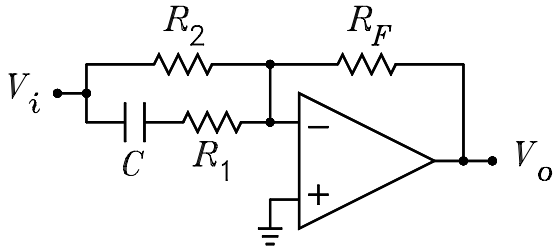
ECE 3050 Analog Electronics Quiz 9

July 15, 2009

Professor Leach Last Name:_____ First Name:_____

Instructions. Print your name in the spaces above. Place a box around any answer. **Honor Code Statement:** *I have neither given nor received help on this quiz.* Initials _____ For credit, you must give all equations that you use to calculate your answers. Credit will not be given for any answer without full supporting work.

1 of 2. (a) What is the expression for the voltage gain V_o/V_i at very low frequencies?
(b) What is the expression for the voltage gain V_o/V_i at very high frequencies?
(c) What is the expression for the pole frequency in rad/s for the transfer function for V_o/V_i?
(d) What is the expression for the zero frequency in rad/s for the transfer function for V_o/V_i?
(e) Sketch and label the straight line Bode magnitude plot for $|V_o/V_i|$.

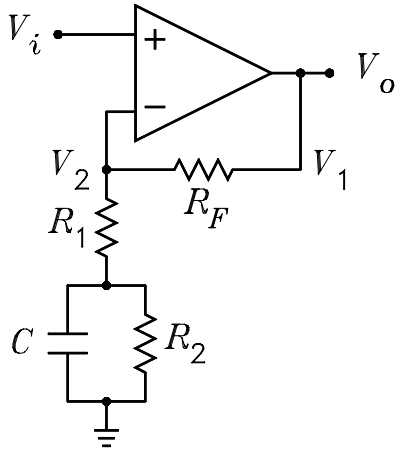


$$A_{low} = -\frac{R_F}{R_2} \qquad A_{high} = -\frac{R_F}{R_1 \| R_2}$$

$$\omega_{pole} = \frac{1}{(R_1 + R_2)\, C} \qquad \omega_{zero} = \frac{1}{R_1 C}$$

High-pass shelving.

2 of 2. (a) What is the expression for the voltage gain V_o/V_i at very low frequencies?
(b) What is the expression for the voltage gain V_o/V_i at very high frequencies?
(c) What is the expression for the pole frequency in rad/s for the transfer function for V_o/V_i?
(d) What is the expression for the zero frequency in rad/s for the transfer function for V_o/V_i?
(e) Sketch and label the straight line Bode magnitude plot for $|V_o/V_i|$.



$$A_{low} = 1 + \frac{R_F}{R_1 + R_2} \qquad A_{high} = 1 + \frac{R_F}{R_1}$$

$$\omega_{zero} = \frac{1}{(R_1 + R_F) \| R_2 C} \qquad \omega_{pole} = \frac{1}{R_1 \| R_2 C}$$

High-pass shelving.