<Solution>

Analog Electronic Circuits

Department of Electrical and Computer Engineering

Seoul National University

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Quiz #6

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Student ID number :

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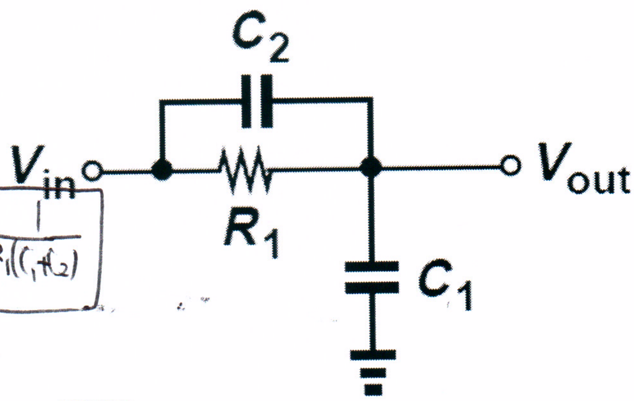
1. Consider the filter shown in Fig below. Compute the sensitivity of the pole and zero frequencies with respect to C_1, C_2, and R_1.



$$\frac{V_{out}}{V_{in}} = \frac{\frac{1}{C_1 s}}{\frac{1}{C_1 s} + R_1 \| \frac{1}{sC_2}}$$

$$\Rightarrow \boxed{\text{zero} = -\frac{1}{R_1 C_2}, \quad \text{pole} = -\frac{1}{R_1(C_1+C_2)}}$$

$$\frac{dp}{dR_1} = [R_1(C_1+C_2)]^{-2}(C_1+C_2) = -\frac{p}{R_1}$$

$$\boxed{S^p_{R_1} = \frac{\frac{dp}{p}}{\frac{dR_1}{R_1}} = -1}$$

$$\boxed{S^p_{C_1} = -\frac{C_1}{C_1+C_2}}$$

$$\boxed{S^p_{C_2} = -\frac{C_2}{C_1+C_2}}$$

$$\boxed{S^z_{R_1} = S^z_{C_2} = -1}$$

$$\boxed{S^z_{C_1} = 0}$$

8개

<채점기준>

{ 다 맞으면 10점

하나 틀릴때 마다 -1점 }