

Microelectronics Circuit Analysis and Design

Homework(13rd)

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1. Consider the feedback circuit in Figure 1.

① Determine the feedback configuration and polarities, and you must label the instantaneous polarities in the figure.

② Determine the effects of the feedback on the input resistor and the output resistor, and explain the output current or voltage tends to be stabilized.

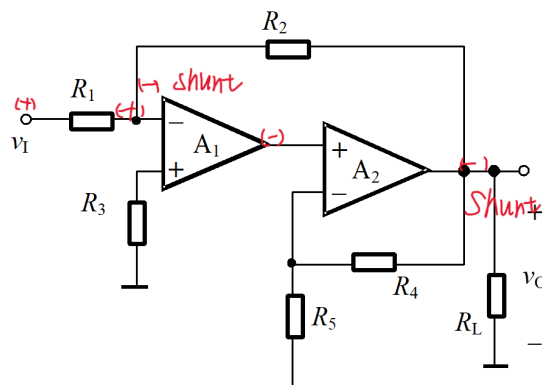


Figure 1: Problem 1

Solution:

① Shunt-Shunt Negative.

② R_I and R_O both decrease.

$$V_O \uparrow \Rightarrow I_{R2} \uparrow \Rightarrow I_{\epsilon} \downarrow \Rightarrow I_o \uparrow \Rightarrow V_O \downarrow$$

2. The feedback circuits are shown in Figure 2. All capacitors act as short circuit to the sinusoidal signal.

① Determine the feedback configuration and polarities, and you must label the instantaneous polarities in the figure.

② Determine the effects of the feedback on the input resistor and the output resistor, and explain the output current or voltage tends to be stabilized

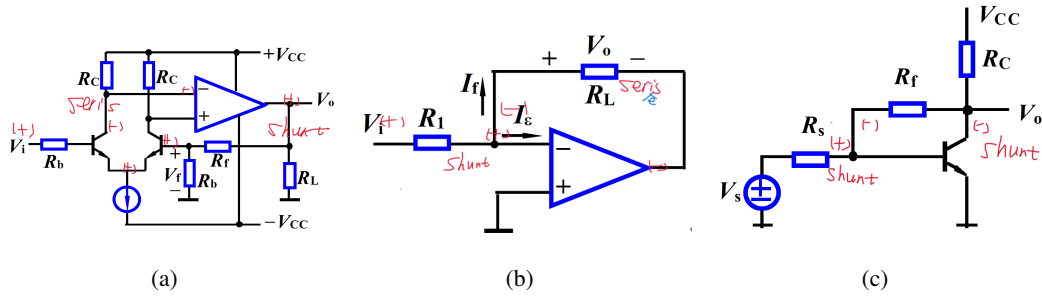


Figure 2: Problem 2

Solution:

① Series-Shunt-Negative; Shunt-Series-Negative; Shunt-Shunt-Negative

② $V_O \uparrow \Rightarrow V_f \uparrow V_E \downarrow \Rightarrow V_O \downarrow$

$I_O \uparrow \Rightarrow I_f \uparrow \Rightarrow I_E \downarrow \Rightarrow I_O \uparrow$

$V_O \uparrow \Rightarrow I_f \uparrow \Rightarrow I_E \downarrow \Rightarrow I_O \uparrow$