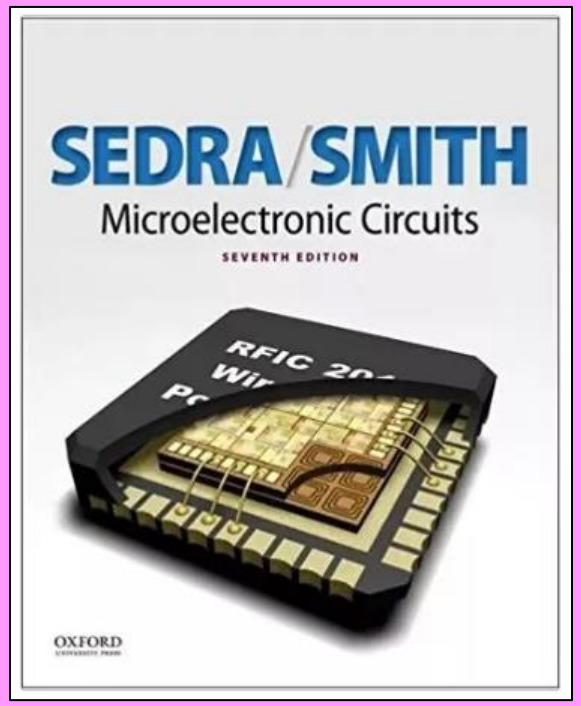
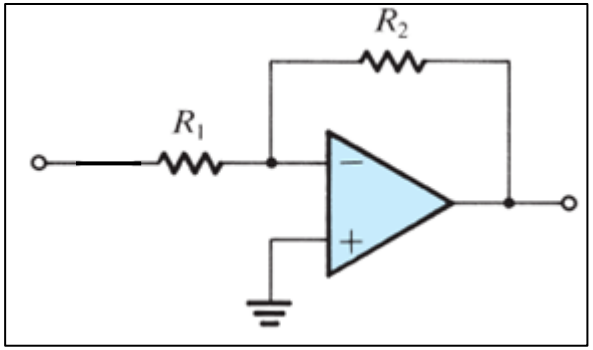
Op Amp
DC Imperfections
Exercises



Oxford University Press
2015, 7th Edition

Exercise 2.22

Consider an inverting amplifier with a nominal gain of 1000 constructed from an op amp with an input offset voltage of 3 mV and with output saturation levels of ± 10V.



a) What is (approximately) the peak sine-wave input signal that can be applied without output clipping?

b) If the effect of V_{OS} is nulled at room temperature (25°C), how large an input can one now apply if:

(i) The circuit is to operate at a constant temperature?

(ii) The circuit is to operate at a temperature in the range 0°C to 75°C and the temperature coefficient of V_{OS} is 10 µV/°C ?

Exercise 2.23

Consider the same amplifier as before - that is, an inverting amplifier with a nominal gain of 1000 constructed from an op amp with an input offset voltage of 3 mV and with output saturation levels of ± 10V. Except here let the amplifier be capacitively coupled.

a) What is the dc offset voltage at the output, and what (approximately) is the peak sine-wave signal that can be applied at the input without output clipping? Is there a need for offset trimming?

b) If R_1 = 1 kΩ and R_2 = 1 MΩ, find the value of the coupling capacitor C_1 that will ensure that the gain will be greater than 57 dB down to 100 Hz.