D 8.65 Design the cascode amplifier of Fig. 8.30(a) to obtain $g_{m1} = 2$ mA/V and $R_o = 200$ kΩ. Use a 0.18-μm technology for which $V_{tn} = 0.5$ V, $V'_A = 5$ V/μm, and $k'_n = 400$ μA/V^2. Determine L, W/L, V_{G2}, and I. Use identical transistors operated at $V_{OV} = 0.25$ V, and design for the maximum possible negative signal swing at the output. What is the value of the minimum permitted output voltage?

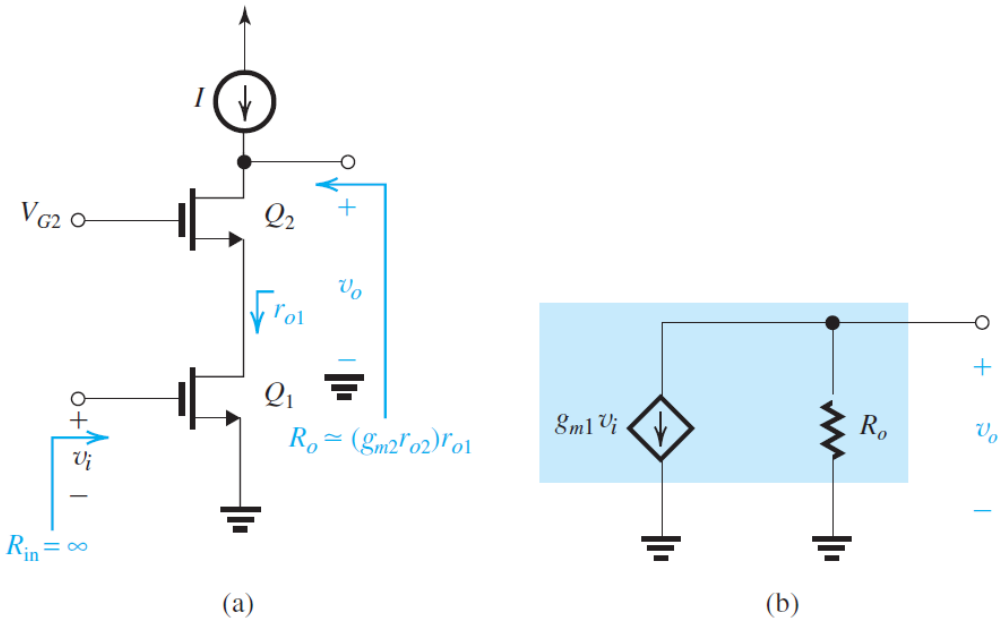

Figure 8.30 (**a**) A MOS cascode amplifier with an ideal current-source load; (**b**) equivalent circuit representation of the cascode output.

D 10.73 It is required to design a cascode amplifier to provide a dc gain of 74 dB when driven with a low-resistance generator and utilizing NMOS transistors for which $V_A = 10$ V, $\mu_n C_{ox} = 200$ μA/V^2, $W/L = 50$, $C_{gd} = 0.1$ pF, and $C_L = 1$ pF. Assuming that $R_L = R_o$, determine the overdrive voltage and the drain current at which the MOSFETs should be operated. Find the unity-gain frequency and the 3-dB frequency. If the cascode transistor is removed and R_L remains unchanged, what will the dc gain become?