Arab Academy for Science & Technology & Maritime Transport
(AASTMT – Cairo Branch)
College of Engineering & technology
Electronics & Communication Engineering Department

Course : Electronic Devices 2
Course Code : EC332

Sheet #5

[1] For the transistor shown in fig.1, $\mu_nC_{ox}(W/L) = 0.5\ mA/V^2$ and ro = 100 kΩ. Find vo/vi, R_i and R_o. What does the gain become for $R_S = 0$? And for $R_S = 3.76$ kΩ?

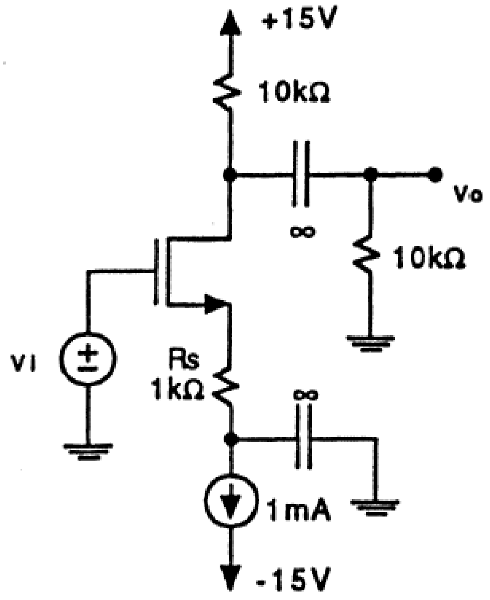

Figure 1

[2] For the transistor shown in fig.2, $\mu_nC_{ox}(W/L)= 2\ mA/V^2$, $V_t = 1$ V, and $V_A = 50$ V. For I = 1 mA, what are v_o/v_i, R_i, R_o for $R_L = R_G$? r_o?.
Note: Channel Length Modulation Effect is neglected in dc analysis.

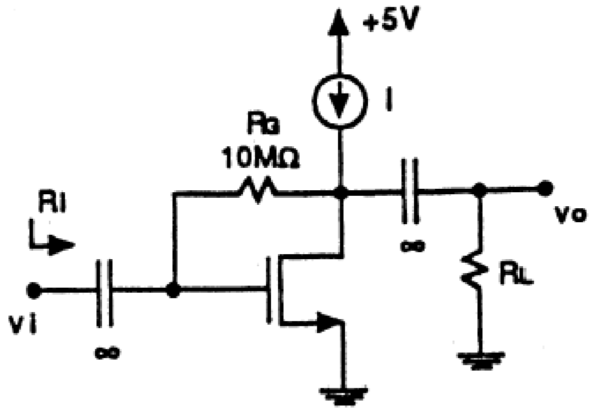

Figure 2

[3] For the CMOS amplifier shown in fig.3 and employs devices for all of which k=k'(W/L)=20µA/V^2 and V_A=100V. What is the small-signal voltage gain, R_{in} and R_{out} which results for I_{REF}=25 µA?

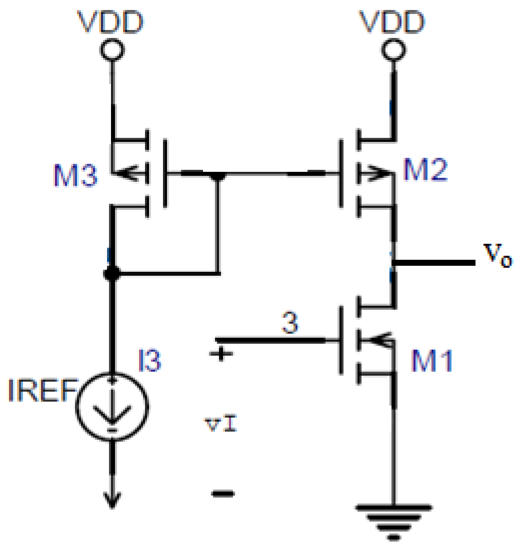

Figure 3

[4] For the common drain shown in fig.4, $\mu_n C_{ox} = 0.1 mA/V^2$, $\frac{W}{L} = 1$ for V_t=1V and $\lambda = 0.01V^{-1}$.

Find the small-signal voltage gain, R_{in} and R_{out}.

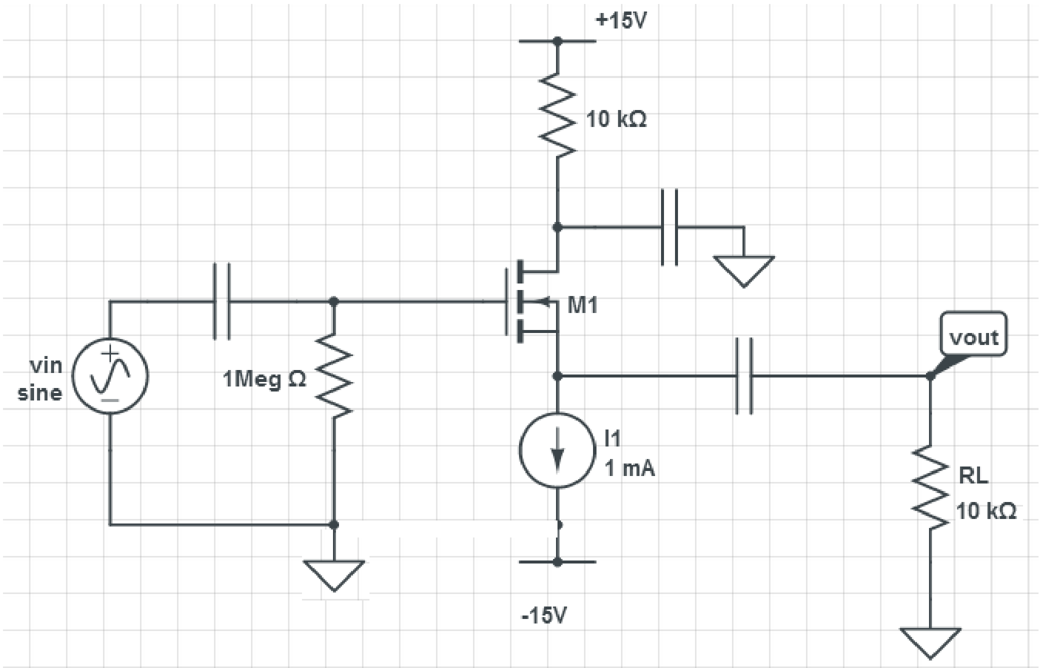

Figure 4

[5] For the common gate shown in fig.5, $\mu_n C_{oc} = 0.1 mA/V^2$, $\frac{W}{L} = 8$ for V_t=1V and $\lambda = 0.01V^{-1}$.

Find the small-signal voltage gain, R_{in} and R_{out}.

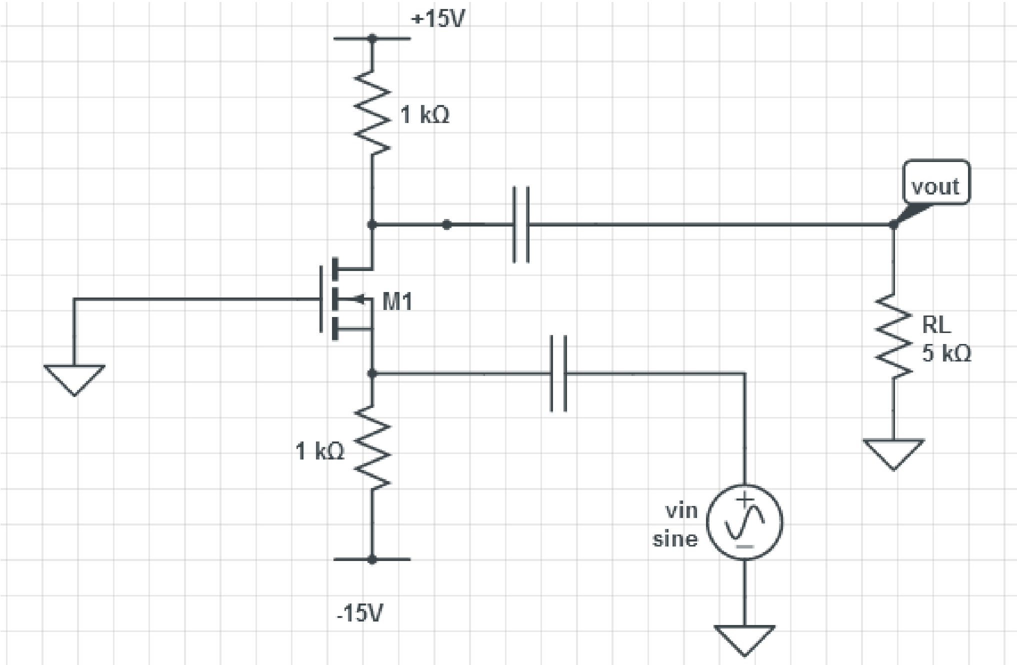

Figure 5