

## QUIZ NO. 9

NAME \_\_\_\_\_ Score \_\_\_\_\_ /10

A NMOS amplifier is shown. Assume that the small-signal parameters of the MOSFET are  $g_m = 1\text{mS}$ ,  $r_{ds} = \infty$ ,  $C_{gs} = 9\text{pF}$ , and  $C_{gd} = 1\text{pF}$ .

- Find the midband voltage gain of this amplifier,  $V_{out}/V_{in}$ .
- Find the value of the upper -3dB frequency,  $f_H$ , in Hz, first using the Miller approximation and secondly using the open-circuit time constant approach.
- Which of the two answers for  $f_L$  in part b.) is the most accurate and why?

