- 1. (25%) The transistor parameters are:  $\beta = 100$ ,  $V_{BE(on)} = 0.7$ V, and  $V_A = \infty$ .
  - (a) Determine the midband voltage gain (15%).
  - (b) Calculate the lower corner frequency. (10%)



2. (25%) The transistor parameters are  $K_n = 0.5mA/V^2$ ,  $V_{TN} = 2V$ , and  $\lambda = 0$ . Determine the maximum value of  $C_L$  such that the bandwidth is at least 5 MHz.



- 3. (25%) The transistor parameters are  $V_{TP} = -2V$ ,  $K_p = 2mA/V^2$ ,  $\lambda = 0.01V^{-1}$ ,  $C_{gs} = 10 pF$ , and  $C_{res} = 1 nF$ 
  - and  $C_{gd} = 1 pF$ .
    - (a) Determine the upper 3dB frequency. (15%)
    - (b) Find the midband voltage gain. (10%)



4. (25%) The transistor parameters are  $\beta = 100, V_{EB(on)} = 0.7V, V_A = \infty, C_{\pi} = 10 pF$ , and  $C_{\mu} = 1 pF$ . Determine the upper 3dB frequencies corresponding to the input and output portions of the equivalent circuit.

