

**Homework Assignment No. 4**Due on Monday, February 2, 2004

Problems in ( ) refer to the first edition.

- 1.) Problem 13.45 (13.40 modified) of the text.
- 2.) Problem 13.52 (13.44) of the text.
- 3.) Problem 13.57 (13.50) of the text.
- 4.) Problem 13.64 (13.57) of the text.
- 5.) An NPN BJT common-emitter inverting amplifier is shown. Assume the parameters of the transistor are  $\beta_F = 100$ ,  $V_T = 25\text{mV}$ , and  $V_A = 100\text{V}$ . (a.) If  $I_C = 0.5\text{mA}$  and  $V_{CE} = 3\text{V}$ , find the small signal model parameter values for  $g_m$ ,  $r_{\pi}$  and  $r_o$ . (b.) Find an algebraic expression for the small signal voltage gain,  $v_{out}/v_{in}$ . (c.) Numerically evaluate the small signal voltage gain,  $v_{out}/v_{in}$ .

