ECE 3041 Spring 2012
Homework Problem Set 10
Homework Problem 10 for Experiment No. 12

Due Week of April 16

1. Use SPICE to plot the dc transfer characteristic V_O versus V_i for the circuit shown below as V_i varies from -20 to $20\,\mathrm{V}$. Use the following parameters for the SPICE simulations for the 1N4148 signal diode: reverse saturation current, $3\,\mathrm{nA}$; emission coefficient, 1.8; and breakdown voltage, $100\,\mathrm{V}$. The values of the circuit components are: $E_1 = E_2 = 3\,\mathrm{V}$, $R_1 = 2\,\mathrm{k\Omega}$ and $R_2 = 1\,\mathrm{k\Omega}$.

2. Use SPICE to plot the output voltage as a function of time for the circuit shown below if the input is a sine wave with a peak to peak value of $30\,\mathrm{V}$, a dc level of $0\,\mathrm{V}$ and a frequency of $1\,\mathrm{kHz}$. Plot the output voltage for two cycles of the input.