EE 4770 **Homework 1** **Due: 7 February 1996**

Problem 1: The value of process-variable x, over range $x \in [0, 500]$, is to be converted to $H(x) = \frac{x}{40}\,\mathrm{V}$ using a transducer with response $H_\mathrm{t}(x) = R_0(1 + xk)$, where $R_0 = 250\,\Omega$ and $k = 10^{-5}$. Complete the design two ways: using a gain/offset circuit and a Wheatstone bridge.

Problem 2: For the gain/offset circuit designed above, find the change in output when $x = 300$ and v_C changes by 1%. For the Wheatstone bridge circuit designed above, find the change in output when $x = 300$ and v_E changes by 1%.