

**BE1010 – Fall 2004**  
**Prof. Mohamad Hassoun, WSU**  
**Quiz # 7 (25 minutes. Open webpage)**

- I. (4 points) Write an NQC implementation of the expression  $y=(10/8)*3500$  so that the RCX generates the most accurate value of y.

**There are multiple ways to solve this, here is one method:**

$$10/8 = 5/4 \quad (5*3500)/4 = 4375$$

- II. (6 points) A passive (resistive) sensor is connected to input #1 of your RCX. Assume that this device (sensor) changes its resistance as a function of relative humidity. You took this device to the lab and did some measurements. You came up with the following data:

<u>Relative Humidity (<math>H_R</math>)</u>	<u>Resistance (<math>R_c</math>)</u>
20	10 K-Ohm
60	5 K-Ohm

Slope=  $m = (20-60)/(5k-10k) = -1/125$   
Y intercept:  $(20-60)/(20-b) = (10k-5k)/(10k-0) : b=100$   
 $Y=mx+b =$  linear equation .....  $H_R=m*R_c+b$

[1]  $R_c = H_R/m + b/m$

[2]  $R_{aw} = (1023*R_c)/(10,000+R_c)$

Plug [1] into [2] and rearrange for  $H_R$ :

$H_R = (102,300 - 180*R_{aw})/(1023-R_{aw})$
--