Chapter 1 (extra)

1.13

$V_{LSB} = 2^{-n} V_{FS} = 3.052 \times 10^{-4}$ V

$\frac{6.83}{V_{LSB}} = (22380.544)_{10}$

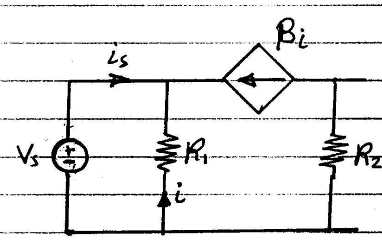
This input will be aproximated with $(22381)_{10}$ to get a degital output of

$(22381)_{10} = 2^{14} + 5997 = 2^{14} + 2^{12} + 1901 = 2^{14} + 2^{12} + 2^{10} + 877$

$= 2^{14} + 2^{12} + 2^{10} + 2^{9} + 2^{8} + 2^{6} + 2^{5} + 2^{3} + 2^{2} + 2^{0}$

$= (1\,0\,1\,0\,1\,1\,1\,0\,1\,1\,0\,1\,1\,0\,1)_2$

1.28



$R_{in} = \frac{V_s}{i_s}$

$i_s = -i - \beta i = -(\beta+1)\, i$

but $i = -\frac{V_s}{R_1}$

$\therefore i_s = \frac{(\beta+1)}{R_1} V_s$

$\therefore R_{in} = \left(\frac{\beta+1}{R_1}\right)^{-1} = \frac{R_1}{\beta+1} = 662\ \Omega$