

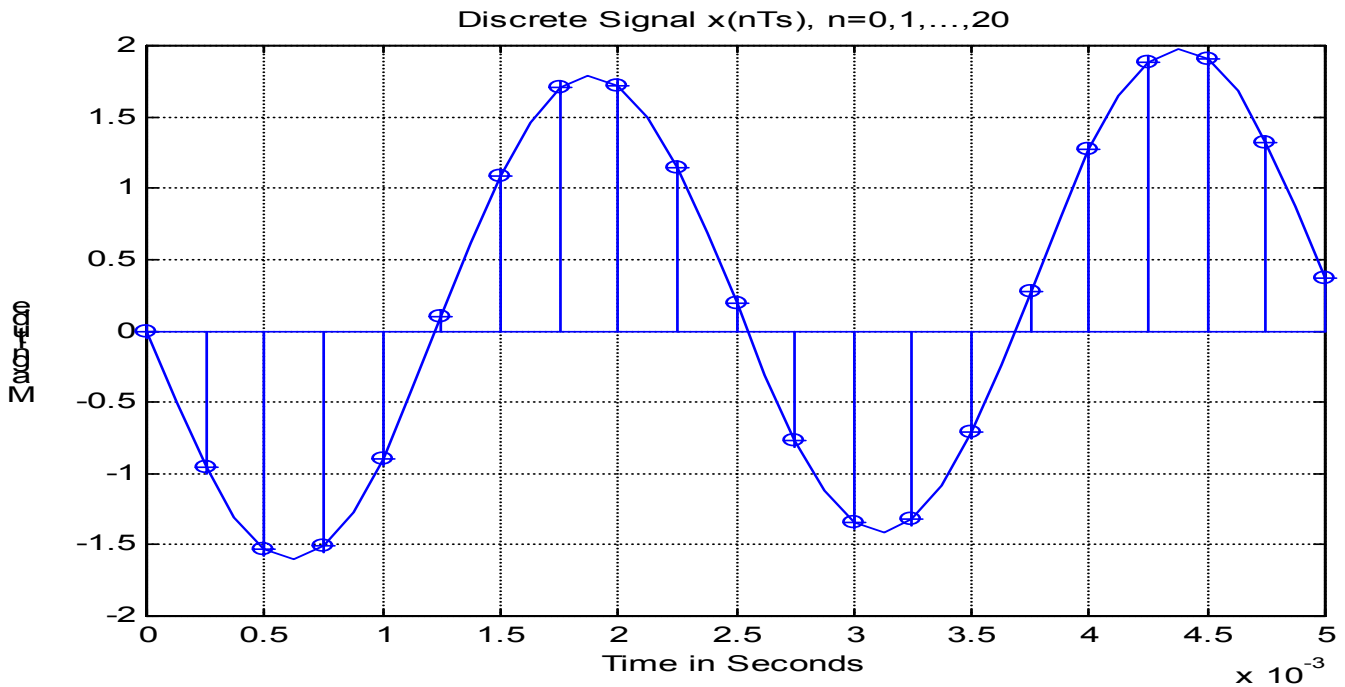
INEL 4301 – COMMUNICATIONS THEORY I

Quiz III - Prof. Domingo Rodríguez – Nov. 25, 2003

Name: _____
 IDNo. _____ Section No. _____

PROBLEM ONE: UNIFORM QUANTIZER AND 3-BIT BINARY CODER

Design an 8-level uniform quantizer and a 3-bit binary coder to produce a binary signal from the discrete signal $x(nT_s)$ shown on the graph given below, where $T_s = 0.25 \times 10^{-3}$ seconds. Provide a plot of the digital signal $x_Q(nT_s)$ on the same graph of $x(nT_s)$. Notice that $\max\{x(nT_s)\}=2$ and $\min\{x(nT_s)\}=-2$.



$x(0) =$ 0.0
 -0.9510
 -1.5315
 -1.5127
 -0.8945
 0.0942
 1.0828
 1.7010
 1.7198
 1.1391
 0.1880
 -0.7632
 -1.3439
 -1.3253
 -0.7073
 0.2811
 1.2694
 1.8873
 1.9056
 1.3246
 $x(20T_s) =$ 0.3730