KFUPM - COMPUTER ENGINEERING DEPARTMENT
COE-540 – Computer Networks
Quiz 01 - November 2nd, 2008

Student Name:
Student Number:

1) (20 points) On Channels and Modems

   a) Define a Linear-Time Invariant (LTI) System?

   b) Draw the delta function $\delta(t)$ in the time domain. Draw the Fourier transform for the delta function.

   c) Define Intersymbol Interference (ISI)? What is its typical effect on bit error performance as a function signal-power to noise power ratio (SNR)?

   d) Draw the frequency response of a high pass channel/filter?

2) (20 points) On Modulation and Capacity – Consider the typical telephone channel whose bandwidth is equal to 4 kHz while the operating SNR is equal to 20 dB.

   a) What is the maximum theoretical capacity for such channel without consideration for noise. Why?

   b) If noise is considered as a factor, compute the maximum theoretical capacity for the channel?

   c) Draw the signal constellation of a 4QAM system. If the system transmits 1K symbols per second, what is the bit rate of the system?