EIE 441 Advanced Digital Communications

Assignment IX  ISI

Please submit to your class representative by **10:30am, 18 November 2002**

1. The sampled values of the received waveform in a binary pulse amplitude modulation (PAM) system suffer from the intersymbol interference (ISI) such that

\[
y(t_i) = \begin{cases} 
  a + n(t_i) + Q & \text{if symbol 1 was sent} \\
  -a + n(t_i) + Q & \text{if symbol 0 was sent}
\end{cases}
\]

where \(Q\) is the ISI term. The ISI term has one of the three values with the following probabilities: \(P(Q = 0.3a) = 1/8\); \(P(Q = 0) = 6/8\); \(P(Q = -0.3a) = 1/8\).

Assume that the noise \(n(t_i)\) is a Gaussian random variable with zero mean and a variance of \(\sigma^2 = a^2/10\). Find the probability of error.