Tutorial 7 Solution

Question 1

Receiver makes a decoding error if 2 or more out of the 3 bits are in error

$P_{error} = 3p^2(1 - p) + p^3 \approx 3(10^{-6})$

Question 2

(a)

$k - 1 = 4$, $n - k = 3$, $n = 8$, $x^3 i(x) = q(x)g(x) + r(x)$, $i(x) = x^4 + x^3 + x + 1$

11011000 = 11111 x 1011 + 001

codeword = 11011001

(b)

Single errors can be detected. Because $g(x)$ has more than 1 term.

(c)

10011001 = 10100 x 1011 + 101

$r(x) = 101$