Exercise 6 Solution

Question 1

(a)

$k - 1 = 6$, $n - k = 3$, $n = 10$, $x^3 i(x) = q(x)g(x) + r(x)$, $i(x) = x^6 + x^4 + x^2 + 1$

```
      1101111
1101 )1010101000
      1101
       1111
       1101
        1001
        1101
         1000
         1101
          1010
          1101
           1110
           1101
             11
```

$\therefore$ 1010101000 = 1101111 x 1101 + 011, codeword = 1010101011

(5 marks)

(b)

```
      0011011
1101 )0010101011
     1101
      1111
      1101
       1001
       1101
        1001
        1101
         100
```

Since $r(x)$ is not zero, error is detected

(5 marks)