

Review Questions

- Assume the generator polynomial is $G(X)=1+X+X^3$.
 - Generate non-separable (7,4) cyclic code word for data word (1 1 1 1).
 - Check if the code word (1001111) is a valid (7,4) cyclic code word or not?

① $V(X) = D(X) * G(X)$

$$\begin{aligned}
 &= (1+X+X^2+X^3) (1+X+X^3) \\
 &= 1 + \cancel{X} + \cancel{X^3} + \cancel{X} + \cancel{X^2} + \cancel{X^4} + \cancel{X^2} + \cancel{X^3} + X^5 + \cancel{X^3} + \cancel{X^4} + X^6 \\
 &= 1 + X^3 + X^5 + X^6
 \end{aligned}$$

code word: (1 0 0 1 0 1 1)

$v_0 \quad v_1 \quad v_2 \quad v_3 \quad v_4 \quad v_5 \quad v_6$

②

$$\begin{array}{r}
 R(X) = 1 + X^3 + X^4 + X^5 + X^6 \\
 \quad \quad \quad X^3 + X^2 + 1 \\
 \hline
 X^3 + X + 1 \int \begin{array}{r} X^6 + X^5 + \cancel{X^4} + \cancel{X^3} + 1 \\ X^6 + \cancel{X^4} + \cancel{X^3} \\ \hline X^5 + 1 \\ X^5 + X^3 + X^2 \\ \hline X^3 + X^2 + 1 \\ X^3 + X + 1 \\ \hline X^2 + X = S(X) \neq 0 \end{array}
 \end{array}$$

Not Valid!