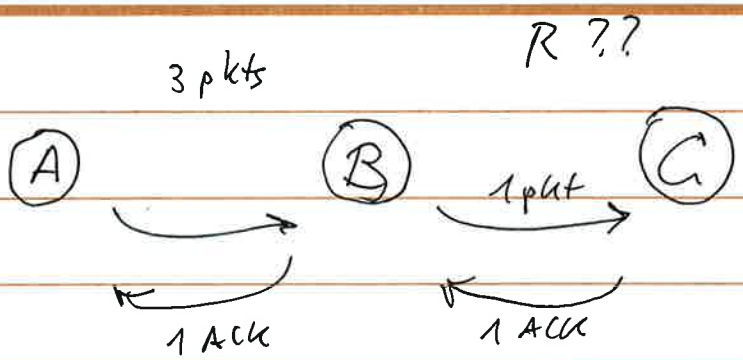

$A \rightarrow B$:

$t_{prop_{A \rightarrow B}} = 4000 \text{ km} \times 5 \frac{\mu sec}{\text{km}} = 20\,000 \, \mu sec = 20 \text{ msec}$

$t_{tx_{\substack{A \rightarrow B \\ frame}}} = \frac{1000 \text{ bits}}{100 \times 10^3 \frac{\text{bits}}{sec}} = 10 \text{ msec}$

$B \rightarrow C$:

$t_{prop_{B \rightarrow C}} = 1000 \text{ km} \times 5 \frac{\mu sec}{\text{km}} = 5 \text{ msec}$

$t_{tx_{\substack{B \rightarrow C \\ frame}}} = \frac{1000 \text{ bits}}{R \frac{\text{bits}}{sec}} = \frac{1000}{R}$

$10^3 = k$ $\quad 10^{-3} = m$

$10^6 = M$ $\quad 10^{-6} = \mu$

$10^9 = G$ $\quad 10^{-9} = n$

$2^{10} = 1024 \approx k$

MSG = 1001 1010

$G(x)$ = 1101

(i) FCS pattern?

(ii) Transmitted pattern?

(iii) MSB ⇄ LSB, can we detect it?

(i) $M(x) = x^7 + x^4 + x^3 + x$

$G(x) = x^3 + x^2 + 1$

$M(x) \times x^k = x^{10} + x^7 + x^6 + x^4 = 10011010000$

$G(x)$ = 1101 $\quad x^{10} + x^7 + x^6 + x^4 \;/\; x^3 + x^2 + 1$

(XOR for each polynomial)

Remainder: $E(x) = x^2 + 1 = 101$

$P(x) = M(x) \cdot x^k + E(x)$

= 10011010101

(iii) MSB → LSB: = 10011010101 ←

= 00011010100

$x^7 + x^6 + x^5 + x^3 \;/\; x^3 + x^2 + 1$