5.2.3.

Consider building a CSMA/CD network at 1Gbps over 1km cable with 200 000 $\frac{km}{s}$ signal speed. What is the minimum frame size?

$T_{tx} \geq 2 T_{prop}$

$T_{prop} = \frac{D}{v_{prop}}$; $T_{tx} = \frac{S_f}{R}$

$\Rightarrow \frac{S_f}{R} \geq 2 \frac{D}{v_{prop}} \Rightarrow S_f \geq 2 \frac{R \cdot D}{v_{prop}} = 2 \cdot \frac{1Gbps \cdot 1km}{2 \cdot 10^5 \frac{km}{s}} = 10000\,b$ (worst case)

~~5.2.4.~~