1a. Alice sends 5000 bytes to Bob
How many frames (64 byte data pr frame)

$$\frac{5000}{64} = 78{,}125 \approx 79 \text{ [frames]}$$

1b. we send with 1 kbit/s What is the min time req.

Bits pr frame $8+6+1+1+8+512 = 536$ [Bits] Hele Framet

$536 \cdot 79 = 42.344$ [Bits] $\rightarrow \frac{42.344}{1000} = 42{,}344$ [s]

$79(65 \cdot 8+6) = 41.554$ [bits] $\rightarrow \frac{41554}{1000} = 41{,}554$ [s] uden ARQ + crc byte

---

1c. Efficiency of the adopted protocol?
Goodput in bitz/s

$$\text{Efficiency} = \frac{\text{Goodput}}{\text{throughput}} = \frac{512}{536} = 95.45\,\%$$

$$\text{Datarate} = \text{Efficiency} \times \text{bits/s} = 0.9545 \times 1000$$

$$= 954.5 \text{ [bits/s]}$$

1d.

$$\text{Efficiency} = \frac{\text{Goodput}}{\text{throughput}} = \frac{512}{530} = 96{,}60\%$$ uden packet length

Datarate = Efficiency x bits/s = 0,966 x 1000 = 966 [bits/s]