

CMPT 434 ~ ASSIGNMENT 2

$$A2. \tau = \frac{d}{s}$$

$$s = \frac{2}{3}C = 2 \times 10^8 \text{ m/s}$$

$$t = \frac{f}{r}$$

f = frame size  
r = data rate

$$a) d = 50 \text{ m} \quad r = 100 \times 10^6 \text{ bps} \quad f = 2 \times 10^3 \text{ bits}$$

$$\tau = \frac{50 \text{ m}}{2 \times 10^8 \text{ m/s}} = 2.5 \times 10^{-7} \text{ s}$$

$$t = \frac{2 \times 10^3 \text{ bits}}{100 \times 10^6 \text{ bps}} = 2 \times 10^{-5} \text{ s}$$

$$\frac{\tau}{t} = 0.013$$

$$b) d = 5 \times 10^3 \text{ m} \quad r = 100 \times 10^6 \text{ bps} \quad f = 2 \times 10^3 \text{ bits}$$

$$\tau = \frac{5 \times 10^3 \text{ m}}{2 \times 10^8 \text{ m/s}} = 2.5 \times 10^{-5} \text{ s}$$

$$t = \frac{2 \times 10^3 \text{ bits}}{100 \times 10^6 \text{ bps}} = 2 \times 10^{-5} \text{ s}$$

$$\frac{\tau}{t} = 1.3$$

$$c) d = 200 \text{ m} \quad r = 10 \times 10^9 \text{ bps} \quad f = 20 \times 10^3 \text{ bits}$$

$$\tau = \frac{200 \text{ m}}{2 \times 10^8 \text{ m/s}} = 1 \times 10^{-6} \text{ s}$$



$$t = \frac{20 \times 10^3 \text{ bits}}{10 \times 10^9 \text{ bps}} = 2 \times 10^{-6} \text{ s}$$

$$\frac{r}{t} = 0.5$$

$$f = 20 \times 10^3 \text{ bits} \quad t = 10 \times 10^{-6} \text{ s} \quad r = 2000$$

$$f = 2000 \quad t = 1 \times 10^{-2}$$

$$f = 2 \times 10^3 \text{ bits} \quad t = 100 \times 10^{-6} \text{ s}$$

$$f = 2 \times 10^3 \text{ bits} \quad t = 2 \times 10^{-2}$$

$$f = 2 \times 10^3 \text{ bits} \quad t = 100 \times 10^{-6} \text{ s} \quad r = 2000$$

$$r = 0.01$$

$$f = 2 \times 10^3 \text{ bits} \quad t = 100 \times 10^{-6} \text{ s}$$

$$f = 2 \times 10^3 \text{ bits} \quad t = 2 \times 10^{-2}$$

$$f = 2 \times 10^3 \text{ bits} \quad t = 100 \times 10^{-6} \text{ s} \quad r = 2000$$

$$f = 2 \times 10^3 \text{ bits} \quad t = 2 \times 10^{-2}$$

$$f = 2$$

$$f = 2$$