Assignment 01 - Delays

Q1)

$$\min_{1000}(T_B - T_A) = 2.8 \text{ ms}$$

Therefore,

$$\text{Average queuing delay} = \frac{\begin{array}{l}(11 - 2.8) \\ + (10 - 2.8) \\ + (3 - 2.8) \\ + (5.5 - 2.8) \\ + (2.8 - 2.8)\end{array}}{5}$$

$$\Rightarrow \quad 3.66 \text{ ms}$$

$$\min_{x}(T_B - T_A) = \frac{\text{Packet size}}{\text{transmission rate}} + \text{propagation delay}$$

~~let, to~~

For packet size $1000 \overset{\text{bytes}}{\Rightarrow}$ ⟶ in bits

$$2.8 = \frac{8000}{x} + y$$

⟶ bits per second

$$2.8 - \frac{8000}{x} = y$$

solving for x, y

$$2 \cdot 4 = \frac{4000}{x} + \left(2 \cdot 8 - \frac{8000}{2}\right)$$

$$2 \cdot 4 = \frac{4\,500}{x} + \left(\frac{2 \cdot 8x - 8500}{2}\right)$$

$$2 \cdot 4 = \frac{4000 + (2 \cdot 8x - 8000)}{x}$$

$$2 \cdot 4x = 2 \cdot 8x - 4000$$

$$2 \cdot 4x - 2 \cdot 8x = -4000$$

$$-0 \cdot 4x = +4000$$

$$x = \frac{4000}{0.4}$$

$$x = 10000 \text{ bits per second.}$$

$$2 \cdot 8 = \frac{8000}{10000} + y$$

$$2 \cdot 8 - \frac{8}{10} = y$$

$$\frac{28 - 8}{10} = y$$

$$2 = y$$

transmission delay $= \dfrac{4800}{10000}$ or $\dfrac{600}{1250}$

$$= 0.48 \, ms$$

Propagation delay $= 2 \, ms$