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Section: BS-DS(N)
Course's Name: Computer Networks
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Assignment 1

Q1.

Given:

Propagation Speed = 50 + [1771 mod 20]
= 61 Km/hr

a. Caravan Distance Travels = 175 Km

Propagation Delay Time = $\frac{\text{Total Distance}}{\text{Propagation Speed}}$

$= \frac{175}{61} = 2.869$ hr

= 2 hour 52 minutes 8 second

Time For Taken By Toll Booths To Reach 10 cars = 2*3
= 6 minutes

So end to end delay = 2 hour 52 minutes 8 seconds + 6 minutes

= 2 hr 58 minutes 8 seconds

b. Time for taken by 3 toll booths to reach 8 cars
= (12 sec × 8) × 3 = 288 secs = 4 minutes 48 seconds
So end to end delay = 2 hour 52 minutes 8 seconds + 4 minutes 48 seconds
= 2 hr 56 minutes 56 seconds

Q2.

GIVEN:

Packet Size = 1200 + [1771 mod 25]
= 1221 bytes

DELAY TIME d[proc] = 0.003 Sec

TRANSMIT PACKET = $\frac{L}{R_i}$

PROPAGATION DELAY = $\frac{d_i}{S_i}$

SOLUTION:

$$\frac{L}{R_1} = \frac{L}{R_2} = \frac{L}{R_3} = \frac{[1221 \times 8]}{2.5 \times 10^6} = \frac{9768}{2.5 \times 10^6}$$

$$= 3.9072 \times 10^{-3}$$

$$\frac{d_1}{S_1} = \frac{5000 \times 10^3}{2.5 \times 10^8} = 0.02$$

$$\frac{d_2}{S_2} = \frac{4000 \times 10^3}{2.5 \times 10^8} = 0.016$$

$$\frac{d_3}{S_3} = \frac{1000 \times 10^3}{2.5 \times 10^8} = 4 \times 10^{-3}$$

End to End Delay = $3[3.9072\times10^{-3}] + 0.02 + 4\times10^{-3} + 0.016 + 2[0.003]$

$= 0.0117 + 0.04 + 0.006$

$= 0.0577$ seconds

Q3.

Given:

L = Bytes Value = $1100 + [1771 \bmod 50]$

$= 1121$

Packet Length = $2L$

Transmission Rate = $R = 2.5$ Mbps

Bit Transmitted Bit = $X = 1121$

Waiting Queue = $n = 4$

Queuing Delay = $\frac{[n[2L] + [2L - X]]}{R}$

$= \frac{[4\times[2\times1121] + [2\times1121 - 1121]}{2.5\text{ Mbps}}$

$= \frac{8969 + 1121 \text{ bytes}}{2.5\text{ Mbps}} = \frac{10089 \text{ bytes}}{2.5\text{ Mbps}}$

$= \frac{10089 \times 8 \text{ bits}}{2.5\times10^{6} \text{ bits per Seconds}}$

$= 0.0323$ Seconds