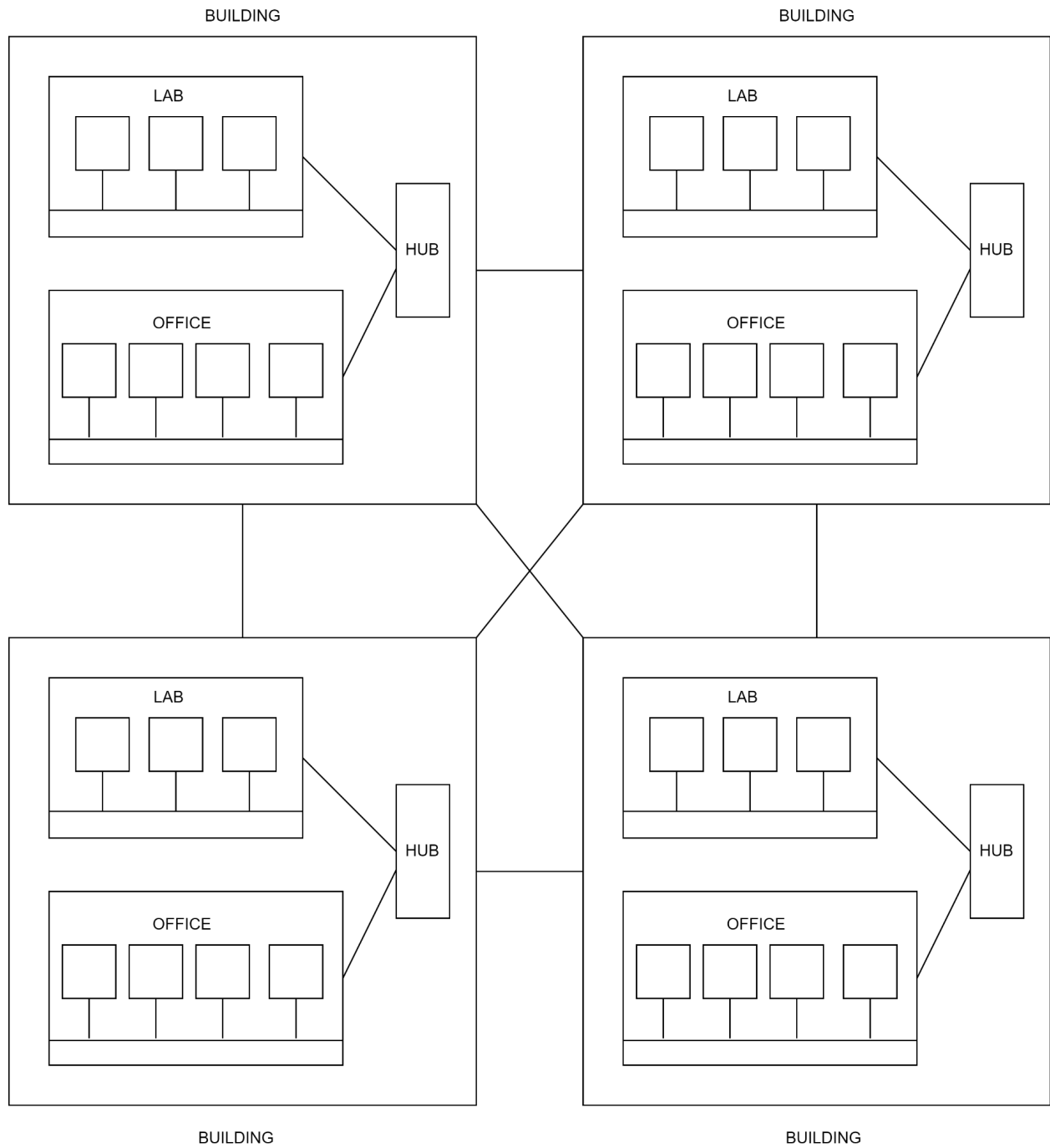


ASSIGNMENT-1

Q1

1. Star
2. Bus
3. Mesh



Q2

3 LANs, because 3 switches are connected to the 3 routers. Switches create LANs.
R1 is the first hop

Q3

Half-Duplex mode allows data to flow in both directions
Services provide information in response to a request
Lower the jitter, higher the effectiveness of a system

Q4

Network
Transport
Network
Data Link
Presentation
Session
Transport
Physical
Presentation

Q5

Frame X	S MAC	D MAC	S IP	D IP	S PORT	D PORT
	E	A	24	20	50000	80

Frame Y	S MAC	D MAC	S IP	D IP	S PORT	D PORT
	H	G	92	24	25	50000

ASSIGNMENT-2

Q1

Bandwidth, $B = 1200 - 150 = 1050 \text{ MHz} = 1050 \times 10^6 \text{ Hz}$

$\text{SNR}_{\text{dB}} = 28$

$\text{SNR} = 630.95$

Shannon, $C = B \log_2(1 + \text{SNR})$

$\Rightarrow C = 9.76 \times 10^9 \text{ bps}$

$9.76 \times 10^9 \times 0.25 = 2 B \log_2 L$

$\Rightarrow L = 2^{1.161} = 2.23 \sim 4$

Maximum theoretical bitrate is $9.76 \times 10^9 \text{ bps}$ and 4 signal levels are needed

Q2

Transmission Delay = $(4400 \times 8) / (18 \times 10^6)$

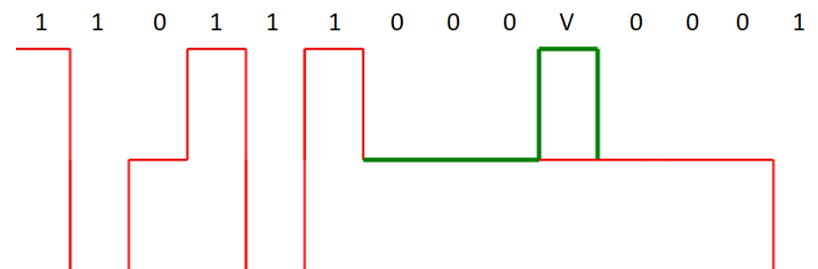
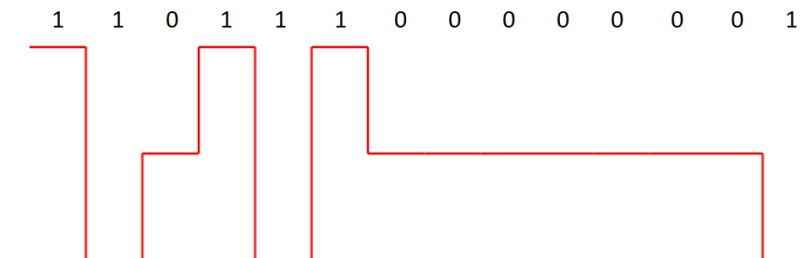
Propagation Delay = $(4800 \times 1000) / (2.6 \times 10^8)$

Queueing Delay = $5 \times 10^{-6} + 2 \times 10^{-12} + 3 \times 10^{-9} + 3 \times 10^{-9}$

Processing Delay = $2 \times 10^{-12} + 4 \times 10^{-12} + 6 \times 10^{-6} + 5 \times 10^{-6}$

Total Delay = Add all

Q3



Q4

Original bit stream - 100000001011

Divide it into 3 bit block

100 000 001 011

Substitute with corresponding 4 bit block from the table

0111 1110 1101 1001

This is the new bit stream - 0111111011011001

