I begin with the name of Allah, Who is Most kind, Most Merciful.

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Course: Data communication & Networks

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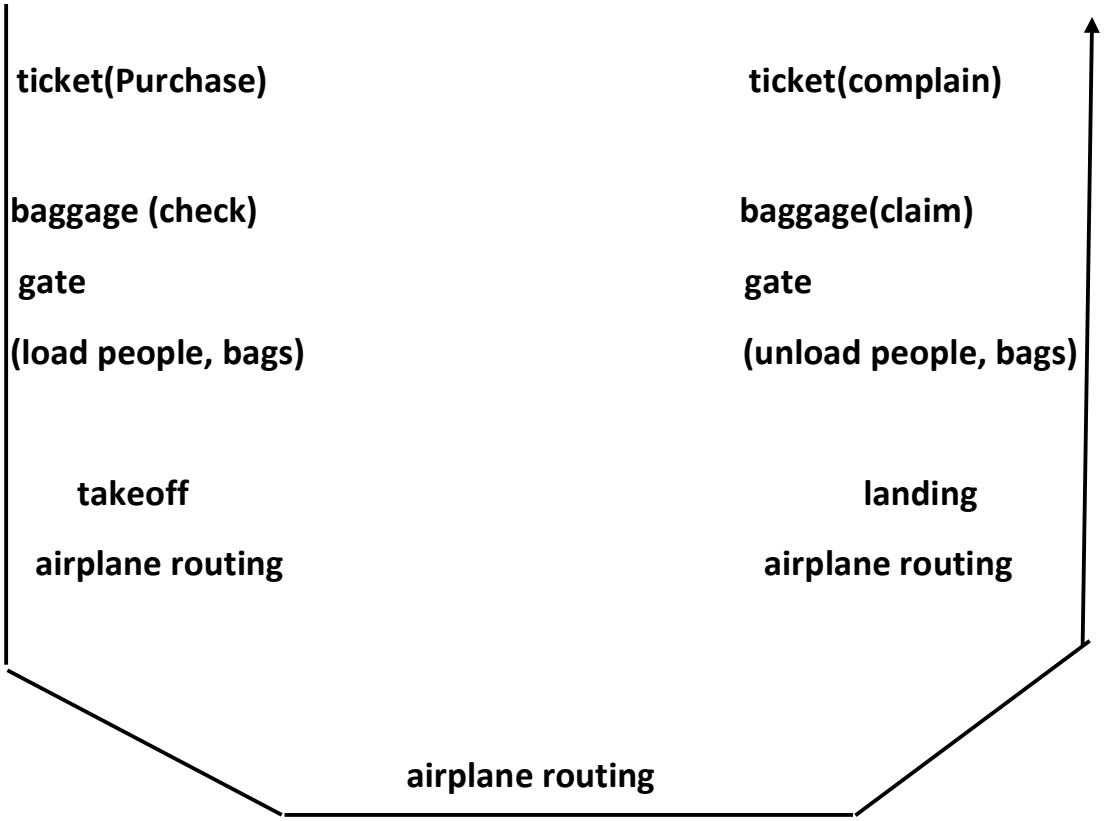
Answer 1:



Answer 2:

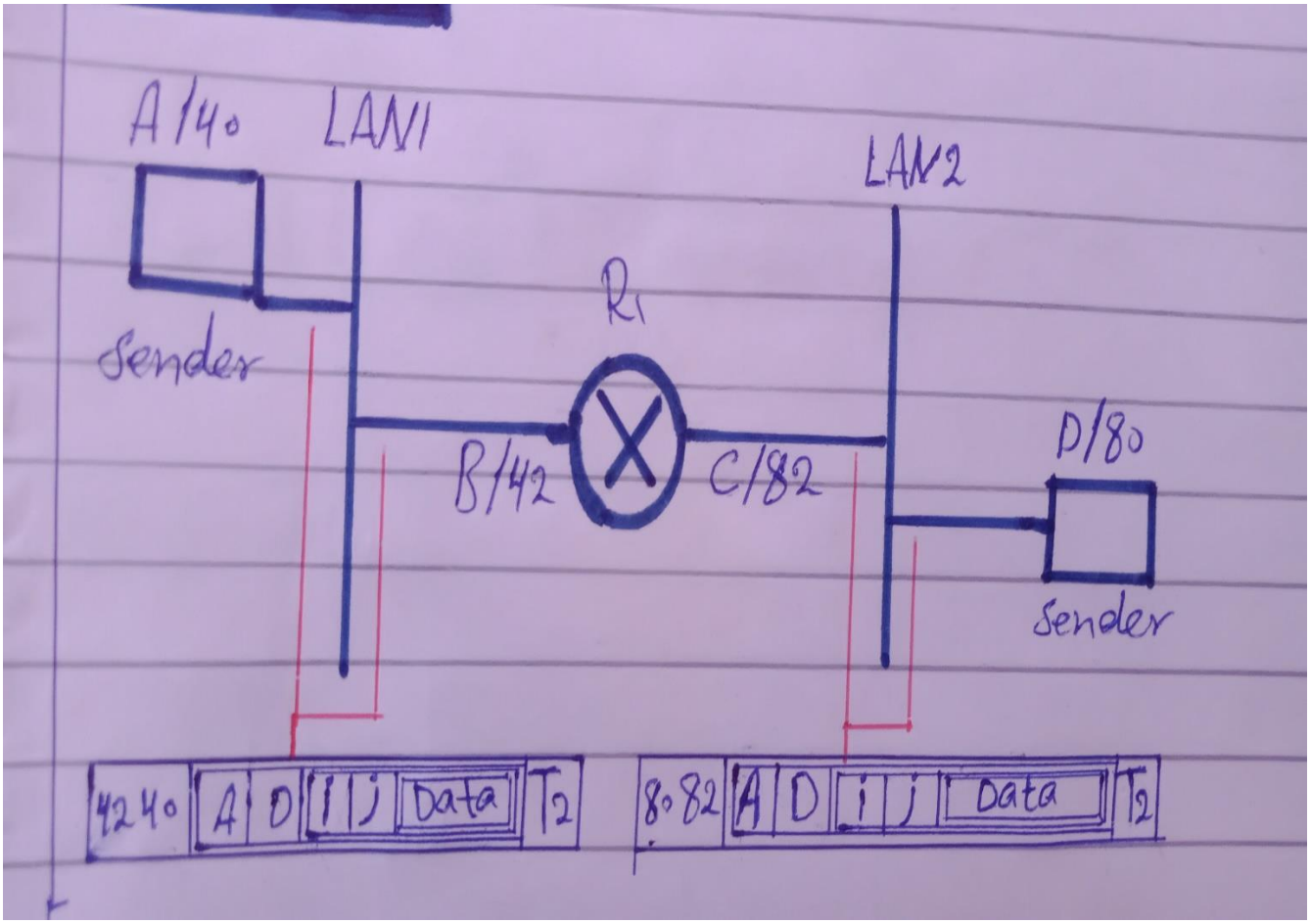
The Advantages are:

1. Single layer to study as all the functionalities is provided at this layer.
2. Higher Bandwidth as number of layer is reduced.
3. It reflects the real-life separation of application from the TCP-downward sections of the OSI model.

The disadvantages are:

1. Can make reasoning about the architecture of network systems less effective.
2. There will be security issues as the Network security and Application Security will open at a single point which may expose our network open at a single point which may expose our network open to our threat.
3. It makes troubleshooting hard as multiple errors may reside a single.

Answer 3:



Answer 4:

a. Bandwidth: 15 KHz SNRdB =30

   C=B*(SNRdB/3) = 15 KHz *(30/3) = 150kbps

   C=150kbps

b. Bandwidth: 100 KHz SNRdB =2

   C=B*(SNRdB/3) = 100 KHz *(2/3) =67kbps

   C=67kbps

c. Bandwidth: 0.5 MHz SNRdB=10

   C=B*(SNRdB/3) = 0.5 MHz *(10/3) =1.67 Mbps

   C=1.67Mbps

Answer 5:

Using NY Quist's equation C=2B log_2M

We have C=4800bps and log_2M=8

Because a signal element encodes a 8-bit word

Therefore, C=4800=2B*8 and B=300Hz

The minimum required bandwidth of the channel = 300 Hz.

Answer 6:

There are 8 bits in 8ns.

Bit rate is $8/(8*10^{-9})$ = 1000Mbps

Answer 7:

C= B log_2(1+SNR)

Where C is Capacity of the channel = 40Mbps = (40 Mbps)/(1Mbps) *1000000 bps = 40 * 10^6 bps

B is the bandwidth of the channel = 6 MHz = (6 MHz)/(1MHz) * 1000000 Hz = 6 * 10^6 Hz

SNR is Signal-to-Noise Ratio

40 * 10^6 bps = (6 * 10^6 Hz) log_2(1+SNR)

(40 * 10^6 bps)/(6 * 10^6 Hz)= log_2(1 + SNR) $2^{6.6667}$ = (1 + SNR)

101.5937 = (1 +SNR)

Signal – to- Noise Ratio SNR = 100.5937

Answer 8: