

# Data and Computer Communication

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## Part B (subjective type)

Q1

Ans

OSI Model :

OSI stand for "open system organization". The OSI model was established in 1976 and the OSI model developed by the ISO organization and was implemented in 1986.

The OSI model consist on seven basic layer. In each layer has their own function and employee.

In OSI model the one is sender and the another one is receiver.

### Note it

The OSI model easily explained by a short story which we will discuss but we will only explained the role of that layer which is mention in the question.

### Let we take start

Let suppose we have a small company in multan and seven employee work in this company. The CEO of this company want to send some letters to another company which placed in mardan.

P.T.O ⇒



### (1) Role of shayan :-

The shayan work in the session layer. when the pervez transfer that letters to the shayan and give idea about those letters to transfer it or send it to the company which is in mardan. So first all shayan call to the mardan company and from the employee of the same seat that are your company will be open or not. when he answer him that yes our company is open then shayan told him that today we send you some letters and when your company receive that letters so kindly inform me.

### (2) Role of Tariq :-

when the shayan conform then he transfer those letters to tariq to send it forward. when tariq received that letters from shayan. So tariq think that these letters are so important. So I need to pack each letter separately and send it forward. So when he perform this action then he forward letters to Nawaz.



### (3) Role of Nawaz :-

when nawaz received the letters from tariq and he saw that these are four letters then he writes address on each letter, that from whom and from where these letters are send to the mardan company.

### (4) Role of Danish :-

when danish received these letters from Nawaz & the Nawaz told him all the story to the danish. Then danish think that these envelop are open from one side. So I need to close the open end of the envelop by gum or by staples and then he sealed that letters. Because he thought that only the receiver can open the letters and read it.



part (b)

Data is independent of signal level.

\* Noisy channel ; Shannan capacity :

As we have this clear idea that in real we have no noiseless channel. The channel is always noisy. In 1949 Claude (Shannan capacity) to determine critical higher data rate for a noisy channel

$$\text{capacity} = \text{Bandwidth} \times \log_2(1 + \text{SNR})$$

In the above formula bandwidth is the bandwidth of the channel SNR is the signal to noise ratio. And capacity is the capacity of the channel of the channel per second.

Note that in the shannan formula there is no indication of the signal level.



Q7

Ans: Types of Errors:

As we note that in digital transmission system the error happens when a bit is altered between transmission and reception.

It happens like this that binary 0 is transmitted and binary 1 is received or binary 1 is transmitted and binary 0 is received. There are two types mostly occur. The one type is burst error and the other one single bit error.

A burst error of length  $B$  is a contiguous sequence of  $B$  bits in which the first and last bit and any number of intermediate bits are received in error.

A single bit error is an isolated error condition that ~~also~~ alters one bit but does not affect nearby bits.

Thus it is clear that burst error, there is a cluster of bits in which a number of errors occur although not must all the bits in the cluster suffer an error.

A single bit error can occur in the presence of white noise, when a slight random deterioration of the signal-to-noise ratio is sufficient to make the receiver confuse.

Burst error can be caused by impulse noise, which was described before.



Q3

Ans In data and computer communication the two networks or more than two networks communicate with each other. Simply we say that share information with each other. For this communication of network we use LAN and WAN.

**LAN:** Local area network. This network use locally mean inside the country.

**WAN:** Wide area network. Mean this network use out of the country. A network that provide long distance transmission of data, it may be voice, message, video or letter, over large geographical area this is called wide area network. The technique used are given below.

① High bandwidth:

The bandwidth describe the maximum data transfer rate of network or internet connection. It measures how much data can be sent over a specific connection in a given amount of time for example a gigabit Ethernet connection has bandwidth of 1000 Mbps.



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## Part A "objective type"

- ⇒ 1 Flow control is the regulation of the amount of data that can be sent.
- ⇒ 2 Forty five physical channels link Ten (10) device arranged in a mesh topology.
- ⇒ 3 Signal reflection at the taps can cause signal degradation in a Bus topology.
- ⇒ 4 Session layer allows a process to add synchronization points into stream of data.
- ⇒ 5 If the maximum value of a simple sine wave is 10 volts, the minimum value is -10 volts.
- ⇒ 6 Choose the correct association between a device and its functionality CPU input.

## Fill in the blanks

- ⇒ 7 Baud rate is always less than or equal to Bit rate.
- ⇒ 8 Stop-and-wait is a Flow control technique.
- ⇒ 9 A 32 bit number is uniquely identified by an IP address and port number.
- ⇒ 10 In Five layer of Tcp/Ip model port address are defined.