

(A) Following frame received at datalink from physical layer with following data. If (02)  
Flag = C and Esc=D which is used by sender for byte stuffing, then which data  
will be deliver to network layer at receiver.

C	ABBDCCDDDCDCDDEA	C
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Stuffed Data is:

C	ABBDCCDDDCDCDDEA	C
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Unstuffed Data is:

ABBDCCDEA
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(B) Define protocol and differentiate connection oriented and connection less (03)  
mechanism.

Protocol:

## Protocol

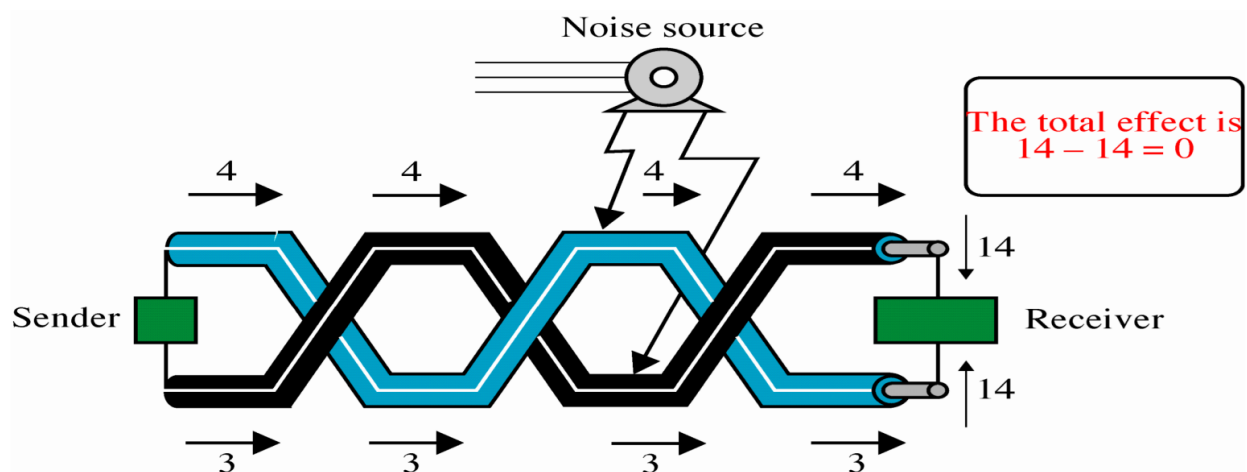
- A protocol is synonymous with rule.
- It consists of a set of rules that govern data communications.
- It determines what is communicated, how it is communicated and when it is communicated.
- The key elements of a protocol are syntax, semantics and timing

Connection Oriented	Connection Less
A connection-oriented service is used to create an end to end connection between the sender and the receiver before transmitting the data over the same or different networks.	Connectionless service is used in the network system to transfer data from one end to another end without creating any connection.
So it must require establishing a connection before sending the data from the sender to the receiver.	So it does not require establishing a connection before sending the data from the sender to the receiver.
<b>Example:</b> Transmission Control Protocol (TCP), telephone system.	<b>Example:</b> User Datagram Protocol (UDP), postal system.
It requires authentication before transmitting the data packets to the receiver.	It does not require authentication before transferring data packets.
It is a more reliable connection service because it guarantees data packets transfer from one end to the other end with a connection.	It is not a reliable connection service because it does not guarantee the transfer of data packets from one end to another for establishing a connection.

(C) Differentiate guided and unguided media. Why pairs of wires to be twisted in twisted pair cable and also write advantages of optical fiber cable. (05)

BASIS FOR COMPARISON	GUIDED MEDIA	UNGUIDED MEDIA
Basic	The signal requires a physical path for transmission.	The signal is broadcasted through air or sometimes water.
Alternative name	It is called wired communication or bounded transmission media.	It is called wireless communication or unbounded transmission media.
Direction	It provides direction to signal for travelling.	It does not provide any direction.
Types	Twisted pair cable, coaxial cable and fibre optic cable.	Radio wave, microwave and infrared.

## Noise on Twisted pair Line



## Noise on Twisted pair Line

- Here in one twist , one wire is closer to the noise source and other is farther, in next twist reverse is true.
- In twist both the wire are equally effected by noise(crosstalk).
- So the difference created at receiver side is zero(we can say negligible)
- So from above, clear that the no. of twist per unit length has some effect on quality of cable.

## Advantages:

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- Higher bandwidth
  - Less signal attenuation
  - Fiber-optic transmission distance is significantly greater than that of other guided media.
  - A signal can run for 50 km without requiring regeneration.
  - Immunity to electromagnetic interference
  - Resistance to corrosive materials. Glass is more resistant to corrosive materials than copper
  - Light weight. Fiber-optic cables are much lighter than copper cables.
  - Greater immunity to tapping.
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