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Answers

1.b) $M = 1010001101$

$x^5 + x^4 + 0.x^3 + x^2 + 0.x + x^0$

1 1 0 1 0 1

Appended $M = 1010001101\overline{00000}$

110101) 1010001101 00000 (

⊕ 110101

011101 101 00000

⊕ 01 00 01

00111 0 10100000

⊕ 110101

00 01 1 0000

⊕ 11 01 01

011001 00

110101

1110

Make it 5 digit

01110

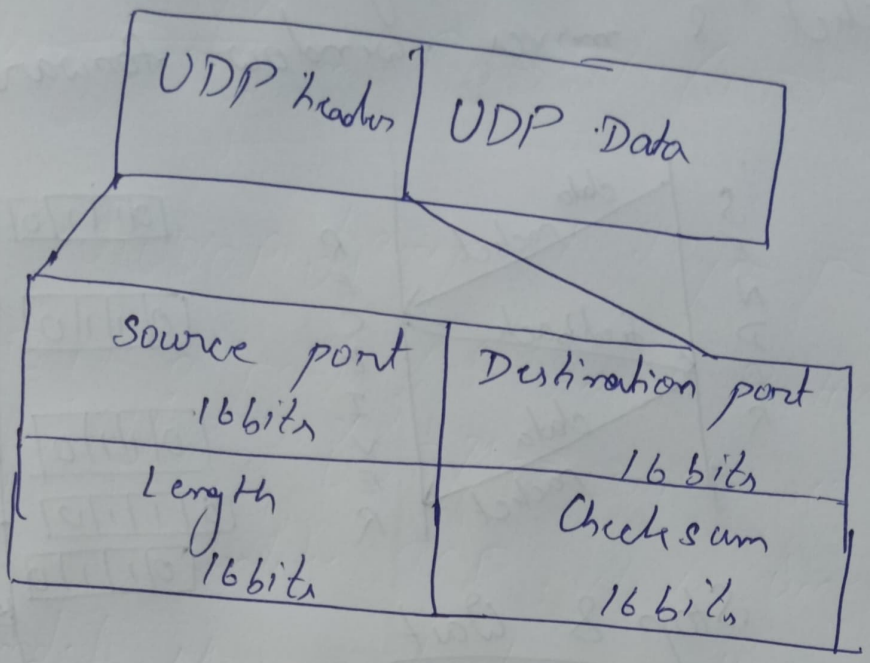
Ans

2.A) User Datagram Protocol (UDP)

UDP is a transport Layer protocol:
UDP is a part of Internet Protocol suite, referred as UDP/IP suite...
Unlike TCP; it is unreliable & connectionless protocol. So, there is no need to establish connection prior to data transfer.

⇒ UDP Header :-

It is 8bytes fixed & simple header, while for TCP it may vary from 20bytes to 60bytes. First 8bytes contains all necessary header information & remaining part consist of data. UDP port number fields are each 16bits long, ∴ range for port numbers defined is from 0 to 65535.



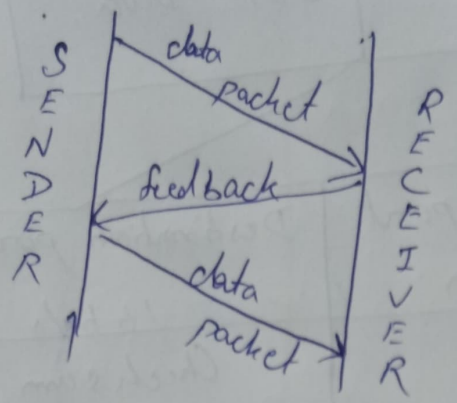
3. B) ⇒ Stop & wait protocol :-

- The sender sends the packet & waits for the ACK (acknowledgement) of the packet. Once the ACK reaches the sender, it transmits the next packet. If the ACK is not received, it retransmits the previous packet again.

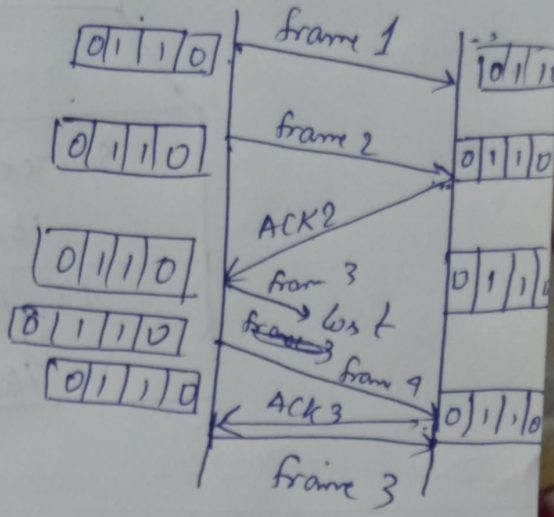
⇒ Selective Repeat :-

- The sender sends packet of window size N & the receiver acknowledges all packet wheather they were recieved in order or not. In this case, the receiver maintains a buffer to contain out of order packets & sorts them.

The sender selectively retransmits the lost packet & moves window forward.



Stop & Wait



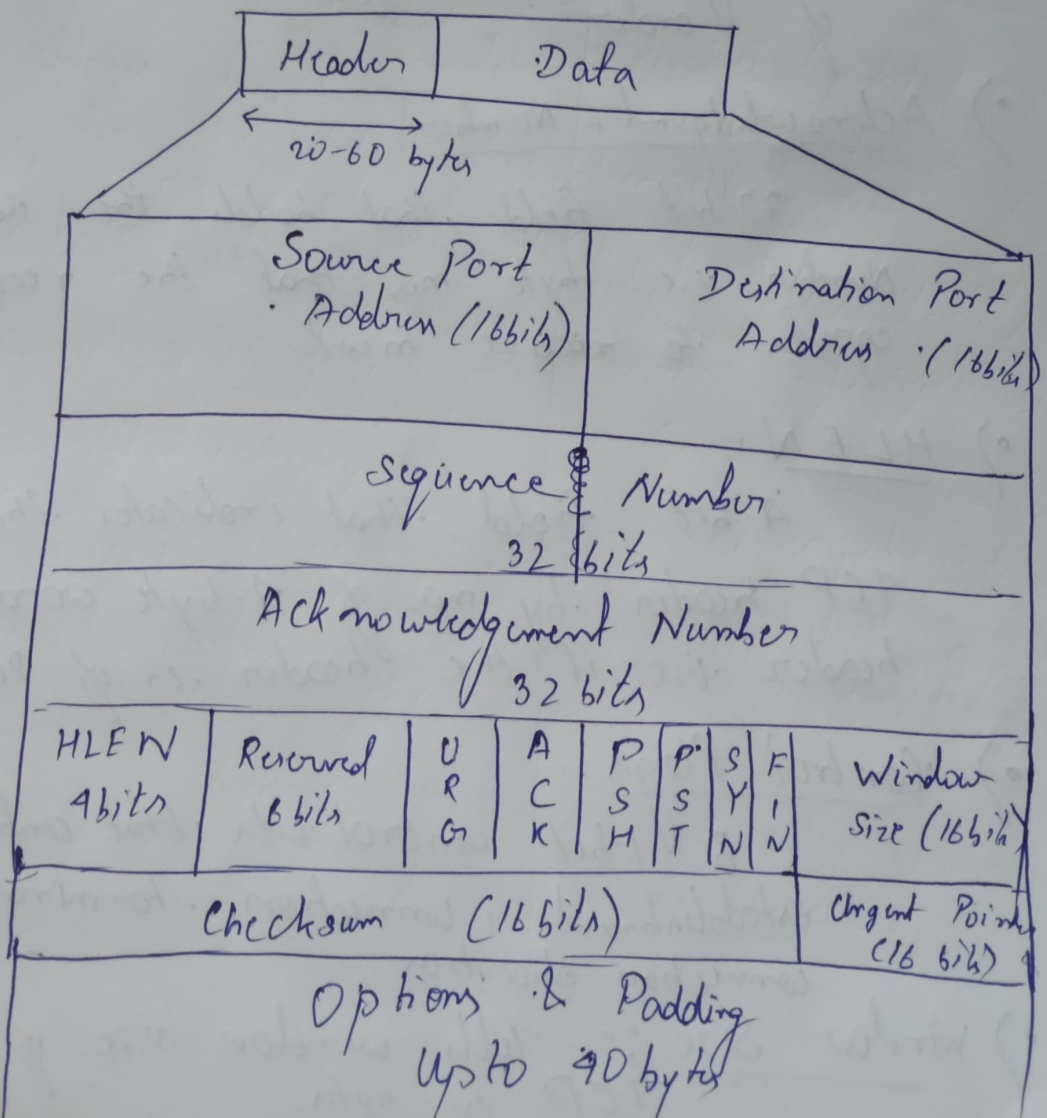
Selective Repeat

4.

IPv4	IPv6
a) IPv4 has 32 bit address length	a) IPv6 has 128-bit address length
b) It supports Manual & DHCP Address configuration	b) It supports auto & remembering address configuration
c) In IPv4 end to end connection integrity is unachievable	c) In IPv6, end to end connection integrity is achievable
d) Address representation of IPv4 is in decimal	d) Address Representation of IPv6 is in hexadecimal.
e) In IPv4, Encryption & Authentication is not provided	e) In IPv6, Encryption & Authentication is provided

f) In IPv4, Packet flow identification is not available	f) In IPv6, Packet Flow Identification are available
g) Security feature is dependent on application	g) IPSEC is inbuilt. — security feature in IPv6 protocol.
h) It has header of 20-60 bytes.	h) It has header of 40 bytes fixed.

5.B) TCP Segment Structure :-



Header Fields:-

- Source Field:-

  16bit field that holds the port address of application that sends data segment

- Destination Port Add.:-

  16 bit field that holds port address that is receiving the data.

- Sequence Number:-

  Used to reassemble the message at receiving end if segments are received out of order.

- Acknowledgment Number:-

  32 bit field that holds the acknowledg Number i.e. byte no. that the receiver expects to receive next.

- HLEN:-

  4 bit field that indicates the length TCP header by no. of 4-byte words in header i.e if the header is of 20 bytes.

- Control flags:-

  6 1-bit control bits that control establishment, connection termination, connection abortion.

- Window Size:- Tells window size of sending TCP in bytes

•) Checksum :-

Holds the checksum for error control.

•) Urgent pointer :-

Used to point to data that is urg. : that needs to reach the receiving process at the earliest.

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6. B) :

I-frame HDLC :-

I-frames or Information frames carry user data from the network layer : They also include flow & error control information that is piggy backed on user data. The first bit of control field of I-frame is 0.

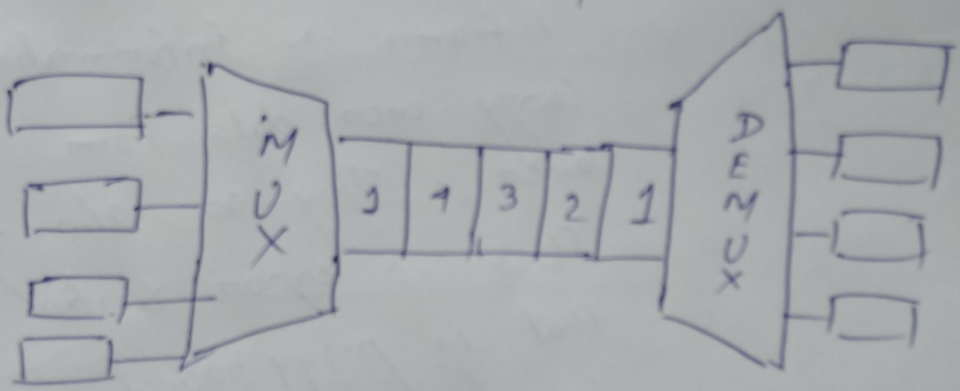
S-frame HDLC :-

S-frames or Information frames do not contain information field. They are used for flow & error control when piggybacking is not required. The first 2 bits of control field of S-frame is 10.

7. A) Time Division Multiplexing (TDM)

TDM is the multiplexing technique : TDM works with digital signals likewise as analog signals. In TDM, synchronization pulse is important. It have 2 types

- Synchronous TDM
- Asynchronous TDM



TDM

Frequency Division Multiplexing (FDM)

FDM is the multiplexing technique which is used in analog system. In FDM, Guard band is required & spectral efficiency of FDM is low.