

Computer NetworksAssignment # 2Qno1

(i) The transport layer handles tasks like segmentation, reassembly, flow control and error detection to ensure that data sent from one application process reaches the correct destination application process intact and in right order. It establishes the logical connections between applications, manages data transmission and handles errors or congestion along the way. It also handles the logical communications between different applications running on computers connected on a network. It abstracts the complexities of the underlying physical network infrastructure and provides a reliable, end to end communication channel b/w the sender and the receiver. If there are any errors or congestion, the transport layer handles issues by retransmitting lost or corrupted segments, adjusting transmission rate and ensuring segments arrive in correct order to the destination.



(ii) UDP is preferred over TCP in the following scenarios:-

1.) Real-Time Video and voice streaming, connections where VoIP is used. example include Whatsapp, ~~Twitter~~, Zoom, etc.

2.) DNS queries.

3.) IoT and Sensor data e.g motion sensor, weight sensors etc.

4.) Real-Time Financial Data Feeds like binance, OctaFx or other apps that use stock markets.

5.) ~~that~~ Streaming and Broadcasting e.g live streams on youtube, twitch etc

6.) Online Gaming such as valorant, CS or Fortnite.

(iii) rdt_rcv() :-

'rdt_rcv()' in RTT protocol is responsible for receiving data packets from the network and delivering them to the receiving application layer. It ensures that the received packets are ordered and free from errors before passing them to the application layer.

rdt_send() :-

'rdt_send()' function is responsible for sending data packets from the application layer to the network. It also implements mechanisms for detecting lost or corrupted packets.

(iv) Udt-Send() :-

The udt-Send() sends data packets over an unreliable network channel. It incorporates mechanisms for ensuring that data packets are delivered without loss, duplication or corruption.

Qno 2

0111, 0010, 1011, 0011
1011, 0011, 1010, 1000

~~Step 1 :-~~

Step 1 :- add numbers

0111	0010	1011	0011
1011	0011	1010	1000
1011	1011	0011	0101
<hr/>			
1110	0001	1001	0000
<hr/>			
+ 1			

1110 0001 1001 0001

Step 2 :- Take one's complement

0001 1110 0110 1110 = 3694

Dec

This is the checksum



Qno3

$$x = 3, y = 2, z = 0$$

0002 0000
0000 0001
0000 0000
3FF0 0000
0003 FFFF
0100 0000
0010 0000

Source port : 2
Destination port : 0
Sequence no : 1
Acknowledgment no : 0
TCP header length : 3*

ACK bit, SYN bit, FIN bit :-

'FC' represents the above bits:-

1111 0000

Ack : 1

SYN : 0

FIN : 0



day / date:

Window size :- 00000
= 0

Checksum :- 0003
= 0011

day / date:

Q no 4

- (a) Source port :- 0019 \Rightarrow 25
- (b) Socket address :- 202.28.33.21:25
- (c) User datagram length :- 001C \Rightarrow 28 bytes
- (d) Data length :- 28 bytes - 8 bytes
 $= 20$ bytes

(e) Based on the ports (25, sender \rightarrow 54,122, receiver)
it is reasonable to assume that the packet is directed from client to a server.