NAME : RADHIKA PATWARI
ROLL NO. : 18CS10062

DATE : 20/2/2021
Computer Networks[CS31006] Class test 2
==========

1.
Connection between processes P1 and P2 can be distinguished using PORT NUMBERS and IP addresses.
- If the 2 processes have same host(identified using IP address) , they are allotted different port numbers to uniquely identify them in a network.
- If the 2 processes have different hosts, then they get separated at the Routers itself using IP address

Every segment transmitted between P1 and P2 contain Transport header that contains Source port number field and destination port number field.
In the same host, P1 and P2 can be distinguished using these port numbers.

Every segment transmitted between P1 and P2 contain Network header that contains Source IP address field and destination IP address field.
In case of different hosts, P1 and P2 can be distinguished using these IP address.

2.
Considering connection between host 1 and host 2,
Suppose connection was going on in between them and suddenly host2 crashes.
Now when host2 again re-starts,host1 initiates connection with host2 using (ACK=1,SEQ=1) (as told in question). But every packet has a maximum lifetime T and it may happen that seq=1 of host1 is still alive as T has not completed. Thus, two segments with seq=1 will be present in the network.(violation)

Thus, using connection establishment,host1 proposes an initial sequence number using CR(seq=x), then host2 acknowledges that using ACK(seq=y,ack=x). This ACK serves as an indicator to host1 that the proposed sequence no. x does not lie in the forbidden region of the previously established connection between host 1 and host 2.Thus it is a safe choice to

initiate sequence number from host1 side.Similarly host 1 sends an ack piggybagged in a data segment as DATA(seq=x,ack=y) which tells host2 that sequence no. y is not present in the forbidden region of the previously established connection.

3.
d = 1+8+3+19+1+0+0+6+2 mod 10 = 0ms -- (So I am writing answers in terms of d as my d value is 0 so all answers will become 0)

(a) no segment sent by either party is lost - A releases connection at 2d and B at 3d after the first DR is sent by A
(b) the first DR segment sent by B in response to the DR segment received from A is only lost - A releases connection at 5d and B releases at 6d
(c) only the first DR segment sent from A to B is successfully delivered, every following segment from either parties is lost - A releases at 15d and B also releases at 15d

4. t+10 = d+10 = 10ms (d=0ms)

Packets sending starts at origin - 0 seq at 0ms (start)
Packets sending stops at 10ms from start time

Coordinates of forbidden region in clockwise direction (parallegram):

(0,0) , (10,10), (25,10) , (15,0)

5.Three-way handshaking ensures correctness during connection establishment; however it alone cannot ensure loss-free connection release because even in DR-DR-ACK technique for connection release, the final sender of ACK packet has no way of knowing if the ACK packet has successfully reached the receiver. Also since it is a 3-way, there will be no further response from the receiver. So sender directly disconnects itself. Now it may happen that the ACK packet does not reach the receiver. So after a particular timeout, the receiver also disconnects.Hence the connection cannot be loss-free as ultimately the final response remain unvalidated in case of 2 connections.

6.

(a)False, The rate at which segments are delivered to the application layer from the transport layer also depends on the rate at which application layer reads data from the transport buffer

(b) True , the client cannot send the frame unless it has received the acknowledgment of the previous frame.If timeout occurs for previous frame then it is re-send.Hence 2 sequence numbers 0 and 1 are sufficient.Hence 1-bit sequence works

(c) False , example as discussed in class, if the bandwidth delay product of a link of so small that it cannot accommodate a single segment, then stop and wait protocol works better than sliding window protocol

(d)False , timestamping every segment can result in synchronisation problem among the routers (as routers can be in different time-zones) , though it is effective, it is not practical

(e) False, as in MIAD , depending upon which connection (A or B) has more initial bandwidth (suppose A),then A will have the entire bandwidth.So it will reach either of the terminal points of the efficiency line.So,only AIMD is a safe technique for congestion control