Lecture 10 Reliability Quiz

1. Which statement best captures the transport-layer abstraction difference emphasized in Lecture 10?

A. TCP and UDP both provide a reliable bytestream, but TCP also adds congestion control.
B. TCP provides a reliable bytestream abstraction, while UDP provides a best-effort datagram abstraction.
C. UDP provides a reliable packet abstraction, while TCP provides only ports.
D. TCP and UDP differ only in port numbering, not in application abstraction.
ANS:

2. What does the transport layer add on top of Layer 3 for both TCP and UDP?

A. De-multiplexing with ports.
B. Encryption of all application data.
C. Guaranteed congestion control.
D. Link-layer retransmission.
ANS:

3. Why do applications prefer TCP's bytestream abstraction?

A. It lets applications manage individual bits on each link.
B. It hides packet-level best-effort behavior and presents ordered bytes over a connection.
C. It makes routers maintain per-application state.
D. It eliminates the need for IP addresses.
ANS:

4. According to the end-to-end principle discussed in the lecture, where is transport-layer reliability implemented?

A. At intermediate routers.
B. At switches only.
C. At end hosts.
D. At every physical link.
ANS:

5. What is the purpose of an acknowledgment in the single-packet reliability design?

A. To tell the sender the packet arrived successfully.
B. To advertise the next router hop.
C. To set the packet checksum.
D. To increase the TTL.
ANS:

6. How does the sender respond when a packet or its acknowledgment is dropped?

A. It waits forever.
B. It sends a negative acknowledgment.
C. It uses a timer and retransmits when the timer expires.
D. It changes the port number.
ANS:

7. Why can cumulative acknowledgments be ambiguous when multiple packets are lost?
A. They reveal the exact set of received packets.
B. They tell the sender which packets were corrupted.
C. They do not specify exactly which later packets arrived, only the highest contiguous sequence received.
D. They are larger than individual acks.
ANS:

8. Why are sequence numbers needed when sending multiple packets?
A. To replace IP addresses.
B. To reorder packets and identify duplicates.
C. To choose a routing protocol.
D. To compute RTT directly.
ANS:

9. What is the main drawback of stop-and-wait?
A. It is incorrect if packets are reordered.
B. It requires no acks.
C. It achieves only one packet per RTT, making it slow.
D. It cannot use sequence numbers.
ANS:

10. What does a window-based algorithm allow the sender to do?
A. Send multiple packets before receiving all corresponding acknowledgments.
B. Eliminate the need for checksums.
C. Avoid using sequence numbers.
D. Deliver packets out of order to the application.
ANS:

11. To fill the pipe, Lecture 10 gives the approximate rule:
A. W = packet size / RTT.
B. W = RTT × bandwidth.
C. W = RTT + bandwidth.
D. W = congestion window + advertised window.
ANS:

12. What does flow control protect against?
A. Overloading routers in the core network.
B. Overloading the recipient's buffer space.
C. Corrupting the checksum field.
D. Choosing the wrong Layer 4 protocol.
ANS:

13. What value does the receiver use to tell the sender how much more data it can accept?
A. Congestion window.
B. Advertised window.
C. TTL.
D. Fragment offset.

ANS:

14. What is the congestion window (cwnd)?
A. A receiver-side field that chooses the port number.
B. A sender-side output of the congestion-control algorithm that limits sending rate.
C. A checksum used only on duplicate acks.
D. A fixed constant equal to the MSS.
ANS: