CMPT 371 - Summer 2019
Quiz 3: June 11, 2019, 5:30pm (Duration: 35 minutes)

First Name:  
Last Name:  
Student Number:  

This is a quick quiz and is used as a measure of your involved presence in the classroom. You have 35 minutes for the following 25 questions. Please mark your answer, using a pencil, in the provided bubble sheets. Please do not forget to write your name on this page and on the bubble sheets.

For multiple choice questions, please choose the best option and fully fill the corresponding bubble on bubble sheet. For true or false questions, use the first two bubbles in the bubble sheet respectively.

Please return the questions with your answer sheet.

**True or False Questions**

1) GoBackN can provide pipelining when there is no receiver-side buffer in place.
   (a) True           (b) False

2) GoBackN always acknowledges the last N packets individually.
   (a) True           (b) False

3) Retransmission, sequence numbers, acknowledgement packets, timers, and checksum can help handle channel errors, and loss.
   (a) True           (b) False

4) The following state machine uses udt_send as the underlying unreliable data transfer protocol.
   (a) True           (b) False

5) The following state machine shows sender side FSM which sends packets in case of receiving correct packets from application layer.
   (a) True           (b) False

6) UDP is connectionless, but it provides congestion control. Therefore, it is popular with multimedia transmission applications.
   (a) True           (b) False

7) There are two types of HTTP messages: Request and Response.
   (a) True           (b) False

8) POP3 is a stateful protocol. It maintains last connection state and data.
   (a) True           (b) False

9) By using cookies, HTTP messages help carry information from client side that if put together with server database information, can handle state information for the connection.
   (a) True           (b) False
10) Window size (in selective repeat) determines the number of in-flight packets.
   (a) True    (b) False
11) If we have an application that has steady-state transmission rate with known smooth
    bandwidth usage, circuit-switching might be an appropriate solution for this application
    as bandwidth can be reserved for each application session without significant waste.
    (a) True    (b) False
12) Processes could only be addressed using source IP address and destination port.
    (a) True    (b) False
13) Load-balancing is achieved better if DNS service is provided in a central way, but security
    and complexity problems prevent scalable implementation of the solution.
    (a) True    (b) False
14) Consider an overlay network with $N$ active peers, with each pair of peers having an active
    TCP connection. Additionally, suppose that the TCP connections pass through a total of
    $M$ routers. There will be $(N+1)(N+2)/2$ edges in the overlay network.
    (a) True    (b) False
15) Server and client applications can never run on the same host as the only address to use
    will be process ports and that is not enough for addressing the processes.
    (a) True    (b) False

**Multiple Choice Questions**

16) Which ones are HTTP 1.1 method types?
   (a) GET, POST, HEAD, PUT, DELETE
   (b) GET, SET, HEAD, DELETE
   (c) GET, SEND, HEAD, DELETE
   (d) GET, POST, Conditional GET

17) What does cumulative ACK mean?
   (a) It means an acknowledgement is sent for each packet separately, regardless of order
   (b) It means an acknowledgement for a packet could be an acknowledgement for in-order
       delivery of all previous packets
   (c) It means an acknowledgement is for accumulation of a full block of content that needs
       to be put together before delivery to the application layer
   (d) It means a full acknowledgement is cumulation of a certain number of ACKs

18) Why does stop-and-wait implementation of the reliable transport protocol have low
    performance?
   (a) Because sender needs to wait a long time for generation of acknowledgement due to
       processing at the receiver side
   (b) Because ACK-based protocols are generally low performance compared to NACK-
       based protocols due to slow detection of loss
   (c) Because the sender sends one packet of data from source to destination in each RTT
       + Transmission delay time, and that imposes a relatively large wait time between
       packet transmissions, and therefore causes a low utilization
   (d) Because it does not detect the bit-flip situations in time

19) What is fast retransmit, and why it is fast?
   (a) It is sending packets using the fastest possible route. It is fast as it uses the best path.
(b) It is retransmitting packets right after sending for the first time. It is fast as there is always two sent of packets in flight in case of a loss.

(c) It is retransmission when triple duplicate ACKS have been received. It is fast because possibility of loss is found before timeout happens and retransmission happens faster.

(d) It is retransmission when one duplicate ACK has be received. It is fast because it sends out retransmissions just in case of a loss.

20) Cookies can be used for
   (a) Authorization, Shopping carts, Recommendations, User sessions state
   (b) User sessions state, Shopping carts, Mail dispatch, Mail authorization
   (c) Recommendations, Mail dispatch, Mail authorization, Shopping cart
   (d) Authorization, Shopping carts, Recommendations, Web caching

21) Which statement is wrong?
   Web caching can
   (a) reduce response time for client request
   (b) reduce traffic on an institution’s access link
   (c) help poor content providers better deliver content
   (d) cache mails for local users

22) Which statement is correct?
   (a) UDP does not guarantee reliable data transfer, but it guarantees fast data delivery
   (b) UDP does not require handshaking between sender and receiver
   (c) UDP adds reliability in the application layer
   (d) UDP guarantees out of order delivery

23) Which one is used in connectionless transport addressing?
   (a) Source IP Address, Source Port Address, Destination IP Address, Destination Port Address
   (b) Source IP Address, Destination IP Address, Destination Port Address
   (c) Destination IP Address, Destination Port Address
   (d) Destination IP Address, Destination Port Address, Source Port Address

24) Assume link utilization is given by \( \frac{N \cdot (L/R)}{(RTT+L/R)} \), where \( N \) is the number of packets of length \( L \), \( RTT \) is round trip time between sender and receiver, and \( R \) is link rate. Which of the following information could be inferred from link utilization?
   (a) \( N \) packets are transferred at link rate and completely acknowledged during the \( RTT+L/R \)
   (b) \( N \) packets are transferred at link rate during \( RTT+L/R \). We do not have information about acknowledgements
   (c) One packet is transferred and acknowledged, and \( N-1 \) packets are on flight during \( N \cdot RTT+L/R \)
   (d) \( N \) packets are transferred and correctly received during \( RTT+L/R \)

25) Which formula shows the end-to-end delay of sending \( P \) packets of size \( L \) back to back over \( N \) links of transmission rate \( R \).
   (a) \( \frac{(N+P)}{(L/R)}+1 \)
   (b) \( (N+P) \cdot (L/R) \)
   (c) \( (N+P-1) \cdot (L/R) \)
   (d) None of the above