CMPT 371 - Summer 2019
Quiz 1: May 14, 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 four 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) Protocols define format, order of messages sent and received among network entities, and actions taken on message transmission and receipt.
   (a) True   (b) False

2) 3G and LTE are examples of Wireless LANs.
   (a) True   (b) False

3) Computer networks are designed and operate based on packet switching principles.
   (a) True   (b) False

4) Tier-1 ISPs connect regional ISPs and IXPs.
   (a) True   (b) False

5) Jitter is defined as packet delay variations.
   (a) True   (b) False

6) Circuit switching allows more users to use the network, compared to packet switching.
   (a) True   (b) False

7) Routing moves packets from routers input to the appropriate output and switching provides source-destination route for packets.
   (a) True   (b) False

8) If users are allocated resources depicted by the different shades shown in the picture below (each shade representing a user resource allocation), the picture shows TDM.
   (a) True   (b) False

9) Synchronization, checkpointing, and recovery of data exchange happen at the Session Layer of the OSI model.
   (a) True   (b) False
10) Circuit switching requires end-to-end reservation and allocation of resources between source and destination.
   (a) True   (b) False

11) In Packet Switching, each packet is transmitted at full link capacity.
   (a) True   (b) False

12) Queuing delay is independent of packet arrival rate at the node.
   (a) True   (b) False

13) Access networks are at the network core.
   (a) True   (b) False

14) DSL is a new technology for enterprise access.
   (a) True   (b) False

15) Hosts are end systems running network applications.
   (a) True   (b) False

**Multiple Choice Questions**

16) How do we calculate Transmission Delay?
   (a) $L/a/R$ where $L$ is packet length (bits), $a$ is average packet arrival rate, and $R$ is link bandwidth (bps)
   (b) $d/s$ where $d$ is length of physical link, and $s$ is propagation speed in medium
   (c) $L/R$ where $L$ is packet length (bits), and $R$ is link bandwidth (bps)
   (d) Neither

17) What is a bottleneck link?
   (a) A link on end-end path that has the lowest delay
   (b) A link on end-end path that is not point to point
   (c) A link on end-end path that constrains end-end throughput
   (d) The link with the highest capacity in the network

18) We have a 10 Mbps link, and users with 200kbps bandwidth when active. Given users are active 25% of the time, how many users can we support with Circuit Switching?
   (a) 10
   (b) 25
   (c) 30
   (d) 50

19) Which are the additional layers in the OSI reference model compared to the Internet Protocol Stack?
   (a) Application and Session
   (b) Transport and Application
   (c) Transport and Link Layer
   (d) Presentation and Session
20) Which items of the following are not network protocols?
   (a) HTTP, TCP, IP
   (b) 802.11, Skype
   (c) TCP, UDP
   (d) RFC, IETF

21) What are the two key core-network functions?
   (a) Routing and forwarding
   (b) TDM and FDM
   (c) Circuit Switching and Packet Switching
   (d) All of the above

22) Which of the following delay elements happens when the packet is traversing along the link?
   (a) Transmission Delay
   (b) Nodal Procession Delay
   (c) Queueing Delay
   (d) Propagation Delay

23) We have a 2Mbps link. We want to share it among our users. Each user is using 200kbps when active. Users are active 20% of the time. With 25 users, the probability that at any given time exactly 20 users are transmitting simultaneously is:
   (a) \( \binom{25}{10} \times 0.1^{10} (1 - 0.1)^{25-10} \)
   (b) \( \binom{200}{10} \times 0.05^{10} (1 - 0.05)^{200-10} \)
   (c) \( \binom{25}{20} \times 0.1^{25} (1 - 0.1)^{25-20} \)
   (d) \( \binom{25}{20} \times 0.2^{20} (1 - 0.2)^{25-20} \)

24) Which one of the following items are examples of guided media?
   (a) Coaxial Cable, Fiber Optics, WiFi
   (b) Satellite, LAN, WAN
   (c) 802.11, Twisted-Pair Copper Wire
   (d) Twisted-Pair Copper Wire, Fiber Optics

25) Which statement is correct?
   (a) If \( La/R > 1 \), average queueing delay will be small
   (b) If \( La/R = 1 \), average queueing delay will be small
   (c) If \( La/R \sim 0 \), average queueing delay will be small
   (d) \( La/R \) is not related to the average queueing delay