

**CS433I/533I: Wireless Networks and Mobile Computing**  
**Fall 2021**

**Quiz #1 Solution**

- Full name only: \_\_\_\_\_
- Release date: Sept 3rd, 2021 (Friday)
- Closed book/note; This should be done individually.
- Total 10 points;

1. [True or False] Wireless communication is not always mobile communication.

[1 pt]

- True

2. In the Internet protocol stack (physical, link, network, transport, and application layers), which layer supports following protocols?

[2 pts]

- |    |      |                     |   |
|----|------|---------------------|---|
| a. | SMTP | [ application layer | ] |
| b. | PPP  | [ link layer        | ] |
| c. | IP   | [ network layer     | ] |

3. Link layer packet is called a [                      ], transport layer packet is called a segment, and network layer packet is called a [                      ].

[1 pt]

- Frame; datagram

4. What is a jitter?

[1 pt]

- A time difference between packets transmitted. When a series of packets is transmitted, the interval between packets may differ.

5. [                      ] is a physical representation of data and it is function of time and location.

[1 pt]

- Signal

6. Suppose there is exactly one packet switch between a sending user and a receiving user. The transmission rates between the sending user and the switch and between the switch and the receiving user are  $R_1$  and  $R_2$ , respectively. Assuming that the switch uses store-and-forward packet switching, what is the total end-to-end delay to send a packet of length  $L$ ? (Ignore queuing, propagation delay, and processing delay.)

[1 pt]

- $L/R_1 + L/R_2$

7. Why is a low frequency not used for data transmission in computer networks?

[1 pt]

- Lower frequencies mean lower data rate and less available bandwidth.
- Lower frequencies also require large antennas for efficient transmission and reception.

8. In wireless communication, compare reflection and scattering.

[1 pt]

- Reflection – If there is a large object (e.g., building, mountain, etc.) compared to the wavelength of the signal, the signal can be reflected.
- Scattering – If the size of an object is small compared to the wavelength of the signal, the signal can be scattered.

9. What does CSMA/CA stand for?

[1 pt]

- Carrier Sense Multiple Access with Collision Avoidance