

CS326e Quiz 3 – The first correct 10 answers will be worth 1 point each. Each subsequent correct answer will be worth 0.2 points. Circle the correct answer.

UTEID \_\_\_\_\_

In the following 7 problems, we are sending a 30 Mbit MP3 file from a source host to a destination host. All links in the path between source and destination have a transmission rate of 10 Mbps. Assume that the propagation speed is  $2 * 10^8$  meters/sec, and the distance between source and destination is 10,000 km.

1.

Initially suppose there is only one link between source and destination. Also suppose that the entire MP3 file is sent as one packet. The transmission delay is:

- 3 seconds**
- 3.05 seconds
- 50 milliseconds
- none of the above.

2.

Referring to the above question, the end-to-end delay (transmission delay plus propagation delay) is

- 6 seconds
- 3.05 seconds**
- 3 seconds
- none of the above

3.

Referring to the above question, how many bits will the source have transmitted when the first bit arrives at the destination.

- 1 bit
- 30,000,000 bits
- 500,000 bits**
- none of the above

4.

Now suppose there are two links between source and destination, with one router connecting the two links. Each link is 5,000 km long. Again suppose the MP3 file is sent as one packet. Suppose there is no congestion, so that the packet is transmitted onto the second link as soon as the router receives the entire packet. The end-to-end delay is

- 3.05 seconds
- 6.1 seconds
- 6.05 seconds**
- none of the above

5.

Now suppose that the MP3 file is broken into 3 packets, each of 10 Mbits. Ignore headers that may be added to these packets. Also ignore router processing delays. Assuming store and forward packet switching at the router, the total delay is

- 6.05 seconds
- 4.05 seconds**
- 3.05 seconds
- none of the above

6.

Now suppose there is only one link between source and destination, and there are 10 TDM channels in the link. The MP3 file is sent over one of the channels. The end-to-end delay is

- 30.05 seconds**
- 30 seconds
- 300 microseconds
- none of the above

7.

Now suppose there is only one link between source and destination, and there are 10 FDM channels in the link. The MP3 file is sent over one of the channels. The end-to-end delay is

- 30.05 seconds**
- 300 microseconds
- 3 seconds
- none of the above

8.

Review the car-caravan example in Section 1.6. Again assume a propagation speed of 100 km/hour. Suppose the caravan travels 200 km, beginning in front of one tollbooth, passing through a second tollbooth, and finishing just before a third tollbooth. What is the end-to-end delay?

- 64 minutes
- 122 minutes
- 62 minutes
- 124 minutes**

9.

Referring to the above problem, suppose now that when a car arrives at the second tollbooth, it proceeds through the tollbooth without waiting for the cars behind it. What is the end-to-end delay?

- 122 minutes and 24 seconds
- 124 minutes
- 122 minutes and 12 seconds**
- 62 minutes

10.

Suppose there are two links between a source and a destination. The first link has transmission rate 100 Mbps and the second link has transmission rate 10 Mbps. Assuming that the only traffic in the network comes from the source, what is the throughput for a large file transfer?

- 100 Mbps
- 1 Gbps
- 110 Mbps
- 10 Mbps**

1.

Before sending a packet into a datagram network, the source must determine all of the links that packet will traverse between source and destination.

- True  
 **False**

2.

Layers four and five of the Internet protocol stack are implemented in the end systems but not in the routers in the network core.

- True**  
 False

3.

The Internet provides its applications two types of services, a TDM service and a FDM service.

- True  
 **False**

4.

ADSL bandwidth is shared.

- True  
 **False**

5.

With ADSL, each subscriber gets more downstream bandwidth than upstream bandwidth.

- True**  
 False

6.

Twisted-pair copper wire is no longer present in computer networks.

- True  
 **False**

7.

Suppose 10 connections traverse the same link of rate 1 Gbps. Suppose that the client access links all have rate 5 Mbps. Then the maximum throughput for each connection is 100 Mbps.

- True  
 **False**

8.

The acronym API in this textbook stands for "Advanced Performance Internet".

- True  
 **False**

9.

Consider a queue preceding a transmission link of rate  $R$ . Suppose a packet arrives to the queue periodically every  $1/a$  seconds. Also suppose all packets are of length  $L$ . Then the queuing delay is small and bounded as long as  $aL < R$ .

- True**  
 False

10.

In the connection flooding attack, the attacker sends a deluge of packets to the targeted host, clogging the target's access link with packets.

- True  
 **False**