Mid-term Exam

Due No due date **Points** 100 **Questions** 18
Available Mar 7 at 2:30pm - Mar 7 at 3:30pm about 1 hour **Time Limit** 90 Minutes

Instructions

This is a timed quiz. You have 60 minutes (unless DSS accommodation applies) to answer the 18 questions, and you can access it starting from 2:30pm, March 7th.

Q14, Q15, Q17 and Q18 will be manually graded.

You will be able to see the answers since Mar 10 (Thu).

This quiz was locked Mar 7 at 3:30pm.

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	56 minutes	100 out of 100

Score for this quiz: **100** out of 100
Submitted Mar 7 at 3:27pm
This attempt took 56 minutes.

Question 1

7 / 7 pts

Select the correct layer in the OSI Stack for each.

Correct!

Layer 1 Physical

Correct!

Layer 2 Data-Link

Correct!

Layer 3

Network

Correct! **Layer 4** Transport

Correct! **Layer 5** Session

Correct! **Layer 6** Presentation

Correct! **Layer 7** Application

Other Incorrect Match Options:

- IP Addressing
- Root

Question 2

5 / 5 pts

Which Layer of the OSI model uses things like Coaxial Cable, Radio Frequency Transmitters?

- Network
- Data-Link
- Correct! Physical
- Transport

Question 3

5 / 5 pts

With respect to Data Framing, what would one need if a DLE appears in the data?

- a DLE cannot occur in the data, the sender will not let that happen
- A DLE for the DLE
- Nothing, the receiver does not read DLEs, therefore it's okay
- The receiver sends a RST Flag

Correct!

Question 4

5 / 5 pts

At which layer does IP make an appearance?

- Transport Layer
- Data-Link Layer
- Network Layer
- Application Layer

Correct!

Question 5

5 / 5 pts

{Select the best fitting term}

- Stations Transmit immediately

- receivers ACK ALL packers
- no ACK = collision.

- Slotted ALOHA
- FRQY
- TDMA

Correct!

- ALOHA

Question 6

5 / 5 pts

What is used in 802.3 Ethernet to help synchronize clocks?

Correct!

- Preamble
- Buffer
- Pad
- SF

Question 7

5 / 5 pts

At which OSI layer does the hub live?

- Data-Link Layer
- Transport Layer

Correct!

- (●) Physical Layer
- ( ) Network Layer

Question 8

5 / 5 pts

In MACA (Multiple Access with Collision Avoidance), what occurs when the sender does not receive a CTS or ACK?

- ( ) Retransmit, enter exponential backoff mode

Correct!

- (●) Assume collision, enter exponential backoff mode
- ( ) The channel is clear, continue sending
- ( ) There would never be a case in which the sender would not receive a CTS or ACK

Question 9

5 / 5 pts

Are IPv4 addresses stored in Big Endian?

- ( ) No

Correct!

- (●) Yes

Question 10

5 / 5 pts

What address class contains the MOST IP addresses?

Correct!

- (selected) Class A
- Class Max
- Class C
- Class B

Question 11

5 / 5 pts

Whose responsibility is it to reassemble IP Fragments?

- Switch
- Sender

Correct!

- (selected) Receiver
- Router

Question 12

5 / 5 pts

At which OSI Layer does switching take place, historically?

- Transport Layer

Correct!

- (selected) Data-Link Layer
- Physical Layer

Network Layer

Question 13

5 / 5 pts

How are bridge roots determined?

You buy a Root Bridge whose sole responsibility is to be the root bridge

Correct!

Comparing BPDUs

Comparing PBSUs

The person setting up the bridge is responsible for determine which bridge is root

Question 14

5 / 5 pts

[Short Answer] What is a Checksum?

Your Answer:

A checksum is a small block of data derived from another block of digital data. It is used for detecting the errors which may have occurred during the transmission or storage of the data. The checksums are used for data integrity but are not used for verifying the data authenticity.

Question 15

5 / 5 pts

[Short Answer] How does Traceroute work?

Your Answer:

Traceroute is the command that is used for running tools for network diagnostics. The tool traces the path of data packets from the source to the destination. The traceroute allows administrators for resolving the connectivity issues.

Working of traceroute:

Traceroute checks each hop of the data packets on its way to the destination and then sends an ICMP error message. With this the traceroute calculates the time of the data transfer

Question 16

5 / 5 pts

Exponential Backoff operates in multiples of _____ bits.

Correct!

512

orrect Answers

512 (with margin: 0)

Question 17

5 / 5 pts

Suppose *N* packets arrive simultaneously to a link at which no packets are currently being transmitted or queued. Each packet is of length *L* and the link has transmission rate *R*. What is the average queuing delay for the *N* packets?

Your Answer:

The queueing delay is 0 for the first transmitted packet and L/R for the second transmitted packet and for it is (n-1)*L/R for the nth transmitted packet. So calculating the average delay for the N packets are:

= (L/R + 2L/R + 3L/R + ...+ (N-1)L/R) /N

= $L/(RN)\sum_{I=1}^{N-1} i$

= (L/(RN))N(N-1)/2

= (N-1)L/(2R)

Question 18

13 / 13 pts

Consider a datagram network using 32-bit host addresses. Suppose a router has four links, numbered 0 through 3, and packets are to be forwarded to the link interfaces as follows:

Destination Address Range	Link Interface
11100000 00000000 00000000 00000000 through 11100000 00111111 11111111 11111111	0
11100000 01000000 00000000 00000000 through 11100000 01000000 11111111 11111111	1
11100000 01000001 00000000 00000000 through 11100001 01111111 11111111 11111111	2
otherwise	3

1. Provide a forwarding table that has four entries (besides one for the "otherwise" case), uses longest prefix matching, and forwards packets to the correct link interfaces (5 points).
2. Describe how your forwarding table determines the appropriate link interface for datagrams with the following destination addresses (3 points).

11001000 10010001 01010001 01010101
11100001 01000000 11000011 00111100
11100001 10000000 00010001 01110111

3. Rewrite this forwarding table using the a.b.c.d/x notation instead of the binary string notation (5 points).

Your Answer:

1. Forwarding table:

Prefix Match	Link interface
11100000 00	0
11100000 01000000	1
1110000	2
11100001 1	3
otherwise	3

2. The prefix match for the first address is the 5th entry. link interface is 3.

The prefix match for the second address is 3rd entry. link interface is 2.

The prefix match for the third address is 4th entry. link interface is 3.

3.

Destination address	Link interface
11100000 00(224.0.0.0/10)	0
11100000 01000000(224.64.0.0/16)	1
1110000(224.0.0.0/8)	2
11100001 1(225.128.0.0/9)	3
otherwise	3

Quiz Score: **100** out of 100