Week 6 Summary Exercises

Due Aug 6 at 11:59pm **Points** 68 **Questions** 27
Available Jul 30 at 12am - Aug 6 at 11:59pm 8 days **Time Limit** 360 Minutes **Allowed Attempts** 2

Take the Quiz Again

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	71 minutes	67 out of 68

Score for this attempt: **67** out of 68
Submitted Aug 3 at 1:06pm
This attempt took 71 minutes.

Question 1

1 / 1 pts

In a link between Host A, and Host B, we have three intermediary routers:

Host A ----- Router Snucky ------ Router Jumpy ------ Router Po ------- Host B

Host A's first hop router is Router Snucky .

Answer 1:

Correct!

Snucky

Question 2

1 / 1 pts

The Internet Protocol (IP) implements congestion control.

True

Correct!

False

Question 3

1 / 1 pts

A router's routing table is output by a routing algorithm .

Answer 1:

Correct! routing algorithm

Question 4

1 / 1 pts

In addition to a "default" entry, routing tables in an internet store...

- all of the above
- a complete path to each of the networks known to the router
- the number of hops in the shortest path to each of the networks known to the router

Correct! the "first hop" in a path to each of the networks known to the router

Question 5

4 / 4 pts

Upon encountering a router with the following routing table:

Prefix Match	Port
10011110 00011110 10001111	0
10011110 00011110 10001111 000	1
10011110 00011110 10001111 01	2
10011110 00011110 10001110 0001	3
Default	4

A datagram with the destination IP address 158.30.143.80 would be routed to Port 2 .

Answer 1:

Correct! Port 2

Question 6

2 / 2 pts

For the following binary IP address, give the dotted-decimal representation:

11111000 00011111 11000111 11111000

Correct!

248.31.199.248

orrect Answers

248.31.199.248

Question 7

2 / 2 pts

For the following binary IP address, give the dotted-decimal representation:

10011000 11101110 10011101 11000011

Correct!

152.238.157.195

orrect Answers

152.238.157.195

Question 8

2 / 2 pts

For the following binary IP address, give the dotted-decimal representation:

11011110 01110011 01100110 01100110

Correct!

222.115.102.102

orrect Answers

222.115.102.102

Question 9

2 / 2 pts

In network graph terminology, [a] represent direct connections between routers.

- Weights
- Correct! Edges
- Shortest Path
- Nodes

Question 10

2 / 2 pts

The "traceroute" application (on Windows) sends UDP messages by default.

- True
- Correct! False

Question 11

2 / 2 pts

IP datagrams fragments can not be fragmented again.

- True
- Correct! False

Question 12

2 / 2 pts

In a subnet, there are ___ reserved IP addresses.

Correct!

2.0000

orrect Answers

2.0 (with margin: 0)

Question 13

2 / 2 pts

It is the responsibility of a routing algorithm to correlate MAC addresses with IP addresses.

- True
- False

Correct!

Question 14

2 / 2 pts

When a destination host's IP fragment timer expires, it drops all accumulated fragments corresponding to that timer.

Correct!

- True
- False

Question 15

2 / 2 pts

ICMP messages are carried within the payload of IP datagrams.

Correct!

- True
- False

Question 16

2 / 2 pts

In network graph terminology, a [a] from A to B is the set of edges to traverse to reach B from A for the lowest total cost.

- Node
- Correct! Shortest Path
- Weight
- Edge

Question 17

2 / 2 pts

In a fragmented IP datagram, the "offset" IP header field value is exactly equal to the number of bytes of fragmented data preceding this fragment.

- True
- Correct! False

Question 18

2 / 2 pts

Routing would be more complicated if we used hardware addresses as network addresses.

- Correct! True
- False

Question 19

2 / 2 pts

The largest amount of data, in bytes, which can be accomodated by a particilar network, link, or physical-layer is called the [a].

- Maximum Segment Size (MSS)
- Sending Size

Correct!

- Maximum Transmission Unit (MTU)

Question 20

2 / 2 pts

It is the responsibility of a routing algorithm to determine a datagram's next hop information.

Correct!

- True
- False

Question 21

2 / 2 pts

Given an internet represented as a weighted undirected graph, the shortest path between node *X* and node *Y* is the path that...

Correct!

- has the smallest sum of edge weights.
- has the smallest number of hops
- connects node X to node Y directly
- begins with the smallest weight on the first hop edge from node X

Question 22

2 / 2 pts

Re-assembly of fragmented IP datagrams is handled by...

- the router in the datagram's path

Correct!

- the destination host.
- the sending host.

the next router with a large-enough MTU.

Question 23

2 / 2 pts

The transport-layer header is encapsulated in every IP datagram fragment.

True

Correct!

False

Question 24

5 / 6 pts

For the IPv4 CIDR address 153.10.22.56 /22

What is the...

- Netmask: [Select]
- Network Address: [Select]
- Host Mask: [Select]
- Broadcast Address: [Select]
- Number of possible hosts: [Select]
- Host Number: [Select]

Answer 1:

Correct!

255.255.252.0

Answer 2:

Correct!

153.10.20.0

Answer 3:

Correct! 0.0.3.255

Answer 4:

You Answered 153.10.22.56

Correct Answer 153.10.23.255

Answer 5:

Correct! 1022

Answer 6:

Correct! 568

Question 25

6 / 6 pts

Put the following steps in the correct order for new host "Jetpack" joining a network with a DHCP-enabled server "Rhino".

1. [Select] sends [Select] to MAC broadcast address
2. [Select] sends [Select] to Jetpack's MAC address
3. [Select] sends [Select] to MAC broadcast address
4. [Select] sends DHCP Ackknowledgement to Jetpack's MAC address

Answer 1:

Correct! Jetpack

Answer 2:

Correct! DHCP Discover

Answer 3:

Correct! MAC broadcast address

Answer 4:

Correct! Rhino

Answer 5:

Correct! DHCP Offer

Answer 6:

Correct! Jetpack's MAC address

Answer 7:

Correct! Jetpack

Answer 8:

Correct! DHCP Request

Answer 9:

Correct! MAC broadcast address

Answer 10:

Correct! Rhino

Answer 11:

Correct! DHCP Ackknowledgement

Answer 12:

Correct! Jetpack's MAC address

Question 26

6 / 6 pts

Suppose that a 1600-byte datagram (identification #20) must transit a network which has a 740-byte MTU. Assume the minimum IP and TCP header sizes, i.e., the IP header is 20 bytes and the TCP header is 20 bytes.

1. How many fragments are created? [Select] ▼ fragments

2. How many bytes of application data are carried in the first fragment?

[Select] bytes

3. How many bytes of application data are carried in the second fragment? 720 bytes
4. How many bytes of application data are carried in the last fragment? 140 bytes
5. What is the identification number of the second fragment? # 20
6. What is the fragment offset in the last fragment? [Select]

Answer 1:

Correct! 3

Answer 2:

Correct! 700

Answer 3:

Correct! 720

Answer 4:

Correct! 140

Answer 5:

Correct! 20

Answer 6:

Correct! 180

Question 27

6 / 6 pts

Using the version of *Dijkstra's Algorithm* discussed in the lectures (see below), and the network configuration in the graph (see below), to calculate the shortest path from node *H* to node *B*.

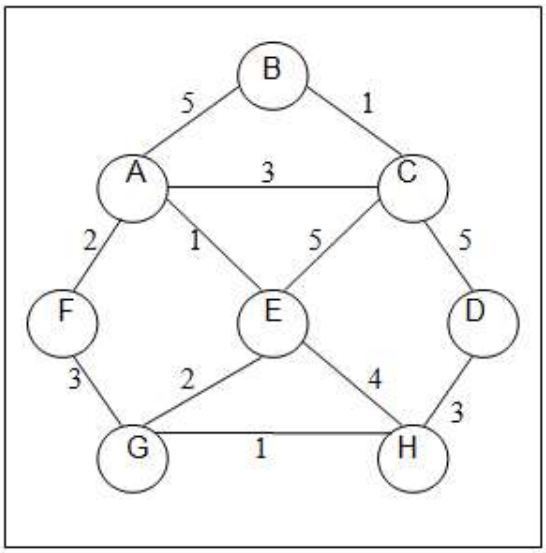
(NOTE#1: *H* is *not* in the original set S.)
(NOTE#2: A tie goes to the lower node (alphabetically).
(NOTE#3: If you use the textbook version of *Dijkstra's Algorithm*, ***find*** the 3rd node to be added to set S' , where S = {A,B,C,D,E,F,G} and S' starts as {H}.)

- What is the 3rd node to be eliminated from the set **S** = {A,B,C,D,E,F,G}?

E

- What is the full shortest path from node H to node B? (e.g. for a path from H to D you would type "H-D" without the quotes) H-G-E-A-C-B
- What is the cost of the shortest path from node H to node B? 8
- Fill in the complete routing table for node H, as it would be calculated by Dijkstra's algorithm and stored inside router H. (It's OK to do this by inspection; you don't have to crank through Dijkstra's algorithm for each destination.)

Destination	First Hop
A	G
B	G
C	G
D	D
E	G
F	G
G	G



Dijkstra's algorithm

```
S = {all nodes except source}
for u in S { /*initialization*/
    D[u] = edge weight (if edge (source, a)
           exists) or ∞ (otherwise)
    R[u] = u (if edge (source, u) exists) or
           * (otherwise)
    P[u] = source ((if edge (source, u) exists)
           or * (otherwise)
}
while (not empty(S)) {
    u = node with smallest value in D
      /* if tie, choose lower (alpha) node */
    if u in S {
       if(D[u] == ∞) {
            error: "no path"; exit;}
       S = S – {u};
       for (each v such that edge (u, v) exists) {
          if(v in S) {
             c = D[u] + weight (u, v);
             if(c < D[v]) {
                D[v] = c;
                R[v] = R[u];
                P[v] = u
             }
          }
       }
    }
}
```

Answer 1:

Correct! E

Answer 2:

Correct! H-G-E-A-C-B

Correct Answer H - G - E - A - C - B

Correct Answer HGEACB

Correct Answer H G E A C B

Answer 3:

Correct! 8

Answer 4:

Correct! G

Answer 5:

Correct! G

Answer 6:

Correct! G

Answer 7:

Correct! D

Answer 8:

Correct! G

Answer 9:

Correct! G

Answer 10:

Correct! G

Quiz Score: **67** out of 68