

The Most Important Question On The Test

1) How many possible IPv4 addresses are there? (Hint: Be within 20%)

Routing

1) Which of the following routing schemes produces perfect routes? (Circle zero or more.)

- flooding
- distance-vector
- BGP
- spanning tree

2) BGP minimizes _____. (Hint: The correct answer is not hops.)

3) In the real Internet, what is routed? (Circle ONE)

- session (groups of packets with a common source and dest)
- individual packets

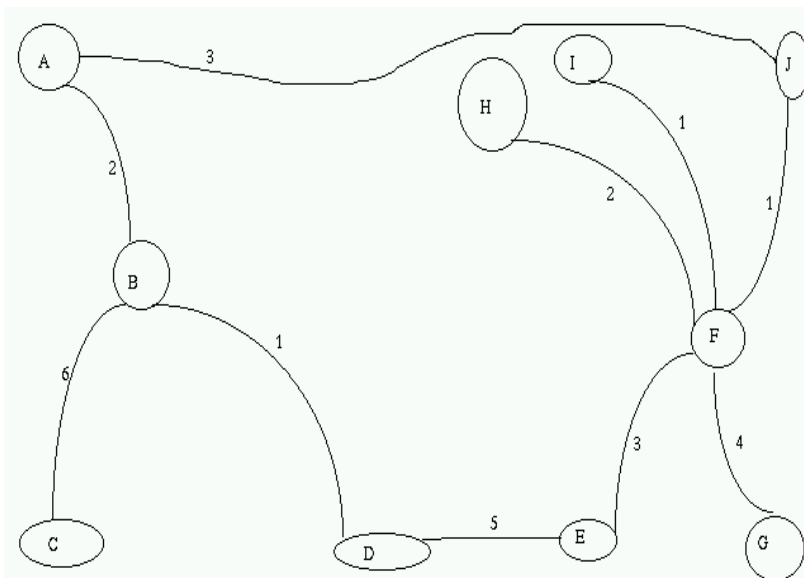
4) Which protocol is your laptop running right now? (Circle zero or more.)

- BGP
- Distance-vector
- Spanning tree

5) List three items that would be in every BGP routing table entry. Or, give an example routing table entry.

6) After two BGP routers have connected and exchanged initial routing tables, name one event that would cause them to communicate.

7) Using distance vector, assume each route starts only with the knowledge of it's directly connected links. After two exchanges of information, what does the routing table for B look like?



IPv6

- 1) Is there anything that IPv4 does better than IPv6, and if so what?

- 2) When a non-dual-stack IPv4 computer receives an IPv6 packet, what happens? (Circle ONE.)
 - a) IPv6 is backwards compatible with IPv4, and the computer should understand it.
 - b) IPv6 is partially backwards compatible. The receiving computer should understand parts of it.
 - c) Pv6 is not backwards compatible. The receiving computer will not understand any it.

- 3) In IPv6, looking at the IP header, how can you tell if the packet is a TCP packet?

- 4) Suppose that the 8th bytes of an IPv6 packet has the value of zero. What does this mean? What should I do?

NAT

- 1) What is the big problem that NAT solves?

- 2) What is the biggest problem a user might face when using NAT?

Programing

```
struct foo {  
    int a;  
    float b;  
    unsigned volatile int c;  
    char d;  
}
```

- 1) Looking at struct foo above, which bytes likely change if I do “b=123.456;”? (hint: Answer something like bytes 103 ... 112 change. Give a byte range.)

- 2) What does the word volatile above mean?

3) What does ntohs() do?

4) (Yes/No) If one thread uses a blocking system call (like read() when there is no data available) do other threads of the same process get blocked?

5) I want to know the IP number of the receiver of a packet. Should I look in 'a' or in 'b' or in 'c'?

```
a = pcap_next(b, c);
```

6) Suppose I have three threads that want to read the values from struct foo above, and only one thread that wants to write it. Who has to use the locking calls? (Circle just ONE.)

All the threads Just the readers Just the writers None of them

7) I want to know if the 5th bit of the byte three bytes after 'ptr' is a 1. Fill in the blank.

```
char *ptr = new char[12345];  
// Random code goes here  
if ( _____ )  
    cout << "Yes";  
else  
    cout << "NO";
```

8) Suppose I do this on a file descriptor. What will happen when I/O occurs?

```
fd = // code to make a file descriptor  
fcntl(fd, F_SETOWN, getpid());  
fcntl(fd, F_SETFL, fcntl(STDIN_FILENO, F_GETFL) | FASYNC);  
// some I/O occur
```

