NAME:_____

COLLABORATOR(S):_____

5/3/1/0   1. What are the two parts of packet? Which stores the address and
          what stores the data?

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5/3/1/0
          2. What makes addressing so important for packet switching networks?

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3. What are the different layers of the protocol layer and what
purpose do they serve in delivering packets?

10/8/6/3/0

Layer Name	Role in Delivering Packets

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5/3/1/0   4. An Internet address (version 4) is stored in how many bytes? What
           type would best store an IPv4 address in C?

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5/3/1/0   5. A domain name, unlike a IP address, is more human usable, what
           protocol enables domain names to be resolved into IP addresses?

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10/8/4/0   6. Using the host command line tool, resolve the following domain
           names to an IPv4 addresses. Circle those that also have an IPv6
           address.

        www.cis.upenn.edu   [   ]

        www.cs.swarthmore.edu   [   ]

        www.usna.edu   [   ]

        facebook.com   [   ]

        microsoft.com   [   ]

5/3/1/0   7. Rerun host again, does any of the IP addresses change? Why might
           a domain name want to resolve to multiple IP addresses?

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5/3/1/0   8. What is the purpose of a port address? How many bytes and what C
           type would store a port address?

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5/3/1/0   9. TCP provides reliable data transmission, but at what cost? Why
           might you want to use UDP over TCP?

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10/8/6/3/0

10. Match the data types to their usage in network addressing:

struct in_addr ___

in_addr_t ___

s_addr ___

sturct sockaddr ___

struct sockaddr_in ___

sin_family ___

sin_port ___

sin_addr ___

struct addrinfo ___

ai_family ___

ai_addr ___

(a) Specifies the address type, e.g. AF_INET, for the addrinfo structure

(b) Specifies the address type, e.g., AF_INET, for the sockaddr_in structure

(c) A type defined unint32

(d) A generic address structure for sockets

(e) Structure to store a IPv4 internet address

(f) A unsigned short storing the port for a sockaddr_in

(g) Structure used to hint at IP addresses for resolving as well as storing results

(h) Member of the sockaddr_in that stores the address

(i) The sole member of the in_addr structure

(j) A generic socket address returned in a addrinfo

(k) A specific address structure for sockets to store IP, port pairs

5/3/1/0 11. Explain the why the following cast is necessary:

```
saddr = (struct sockaddr_in *) result->ai_addr;
```

5/3/1/0 12. The following functions are opposites, inet_ntoa() and inet_aton(), what are their purposes? Provide a small example.

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5/3/1/0 13. What byte order does local hosts use and what does the network use? (That is, Big vs. Little Endian...)

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5/3/1/0 14. When you are assigning a port to a socket address, which of these two conversion should use and <u>why</u>? htnos() or ntohs()?

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5/3/1/0 15. Consider setting the address for 10.4.32.41 on port 22, set the fields appropriately:

stuct sockaddr_in saddr;

5/3/1/0 16. Label each of the arguments in this socket() and give a brief explanation of their meaning:

sock = socket(AF_INET, SOCK_STREAM, 0)

5/3/1/0 18. Label and provide a brief explanation for each of the arguments to this call to connect():

connect(sock, (struct sockaddr *) saddr_in, sizeof(*saddr_in)

5/3/1/0 19. Above, why must we cast **saddr_in** to **struct sockaddr**?

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