

- 1. (4 points)** If Network 'A' is using Ethernet II in the Physical Layer and Network 'B' is using Token Ring in the Physical Layer, would these networks be able to communicate? Explain your answer. If so, how could this be implemented? If not, why not?
- 2. (4 points)** On an Ethernet 802.3 network, if two or more devices should happen to send data at exactly the same time there will be a data collision. Explain in detail what happens if a data collision is detected.
- 3. (4 points)** You obtained the following information from a workstation:

```
C:\>ipconfig
```

```
Windows IP Configuration
```

```
Ethernet adapter E190x1:
```

```
    IP Address. . . . . : 169.254.10.105  
    Subnet Mask . . . . . : 255.255.0.0  
    Default Gateway . . . . . :
```

Explain everything that can be determined about this host.

4. (7 points) Explain the 5 characteristics of an Ethernet network and how a switch interacts with those characteristics.
5. (6 points) The following information was obtained from a host computer:

```
00:05:17.176507 74.125.228.54.1270 > 64.254.128.66.25: S 2688560409:2688560409(0) win 16384 <mss 1460> (DF) (ttl 46, id 20964)
00:05:17.176700 64.254.128.66.25 > 74.125.228.54.1270: S 774583594:774583594(0) ack 2688560410 win 8760 <mss 1460> (DF) (ttl 64, id 35473)
00:05:17.302784 74.125.228.54.1270 > 64.254.128.66.25: . ack 1 win 17520 (DF) (ttl 46, id 21021)
00:05:17.906230 64.254.128.66.25 > 74.125.228.54.1270: P 1:93(92) ack 1 win 8760 (DF) (ttl 64, id 35502)
00:05:18.021955 74.125.228.54.1270 > 64.254.128.66.25: P 1:29(28) ack 93 win 17520 (DF) (ttl 46, id 21354)
00:05:18.023785 64.254.128.66.25 > 74.125.228.54.1270: P 93:184(91) ack 29 win 8760 (DF) (ttl 64, id 35505)
00:05:18.140187 74.125.228.54.1270 > 64.254.128.66.25: P 29:67(38) ack 184 win 17520 (DF) (ttl 46, id 21464)
00:05:18.174986 64.254.128.66.25 > 74.125.228.54.1270: P 184:229(45) ack 67 win 8760 (DF) (ttl 64, id 35514)
00:05:18.289620 74.125.228.54.1270 > 64.254.128.66.25: P 67:99(32) ack 229 win 17520 (DF) (ttl 46, id 21594)
00:05:18.298831 64.254.128.66.25 > 74.125.228.54.1270: . ack 99 win 8760 (DF) (ttl 64, id 35523)
00:05:18.353209 64.254.128.66.25 > 74.125.228.54.1270: P 229:273(44) ack 99 win 8760 (DF) (ttl 64, id 35524)
00:05:18.469836 74.125.228.54.1270 > 64.254.128.66.25: P 99:105(6) ack 273 win 17520 (DF) (ttl 46, id 21661)
00:05:18.474644 64.254.128.66.25 > 74.125.228.54.1270: P 273:323(50) ack 105 win 8760 (DF) (ttl 64, id 35529)
00:05:18.607459 74.125.228.54.1270 > 64.254.128.66.25: P 105:1129(1024) ack 323 win 17520 (DF) (ttl 46, id 21704)
00:05:18.615449 74.125.228.54.1270 > 64.254.128.66.25: . 1129:2589(1460) ack 323 win 17520 (DF) (ttl 46, id 21705)
00:05:18.695594 64.254.128.66.25 > 74.125.228.54.1270: . ack 2589 win 8760 (DF) (ttl 64, id 35538)
00:05:18.818813 74.125.228.54.1270 > 64.254.128.66.25: P 2589:3698(1109) ack 323 win 17520 (DF) (ttl 46, id 21827)
00:05:18.834821 64.254.128.66.25 > 74.125.228.54.1270: P 323:367(44) ack 3698 win 8760 (DF) (ttl 64, id 35552)
00:05:18.979682 74.125.228.54.1270 > 64.254.128.66.25: P 3698:3704(6) ack 367 win 17520 (DF) (ttl 46, id 21900)
00:05:18.979877 74.125.228.54.1270 > 64.254.128.66.25: F 3704:3704(0) ack 367 win 17520 (DF) (ttl 46, id 21901)
00:05:18.979957 64.254.128.66.25 > 74.125.228.54.1270: . ack 3705 win 8754 (DF) (ttl 64, id 35571)
00:05:18.983169 64.254.128.66.25 > 74.125.228.54.1270: F 412:412(0) ack 3705 win 8760 (DF) (ttl 64, id 35574)
```

a) What type of tool would be used to obtain the information above?

b) What such 2 tools were used/discussed in labs for this class? Explain; Differences between each?

c) What are the requirements in order to successfully run such a tool?

6. (8 points) Explain each of the good 'Network Design goals' as discussed in class.

7. (8 points) The following information was extracted from an Ethernet Frame:

Ethernet Frame Header: 00 e0 b0 ac ac a8 00 02 2d 65 ba 89 08 00

Describe everything that can be determined about this frame

8. (12 points) The following information was obtained from a host with an IP address of 205.133.127.8 subnet mask 255.255.255.0 and a default gateway of 205.133.127.1:

*Note: all addresses between 205.133.127.0 and 205.133.127.255 are on the same LAN

```
C:\>ping foxnews.com
Pinging 96.17.202.208 with 32 bytes of data:
```

```
Reply from 96.17.202.208: bytes=32 time<10ms TTL=255
Reply from 96.17.202.208: bytes=32 time<10ms TTL=255
Reply from 96.17.202.208: bytes=32 time<10ms TTL=255
```

```
C:\>ARP -a
Internet Address      Physical Address
205.133.127.1        00-50-54-7b-e8-c0
205.133.127.4        00-10-1f-52-10-00
205.133.127.8        00-60-08-93-38-c2
205.133.127.9        00-60-08-93-38-db
205.133.127.12       00-50-04-c3-c1-95
205.133.127.14       00-c0-f0-12-ad-59
205.133.127.16       00-10-4b-c9-61-37
205.133.127.17       00-50-da-11-f7-5f
205.133.127.30       0-50-da-0b-ff-4b
205.133.127.34       00-50-04-01-89-39
205.133.127.255     ff-ff-ff-ff-ff-ff
205.133.127.39       00-a0-4b-05-21-c8
205.133.127.47       00-c0-05-01-4e-4b
205.133.127.76       08-00-20-0b-6d-b9
205.133.127.84       00-c0-05-04-14-17
205.133.127.85       00-c0-05-04-1e-19
205.133.127.86       00-c0-05-04-39-2a
205.133.127.88       00-c0-05-04-5b-c9
205.133.127.101      00-c0-05-04-39-2a
205.133.127.110      00-c0-05-04-14-17
205.133.127.116      00-80-5f-e4-f1-46
205.133.127.234      00-40-33-ca-a1-5d
205.133.127.238      00-60-97-79-2-8a
```

- a) Describe the sequence of events (in detail) that would occur if this host then had data destined for:
- 1) 205.133.127.86
 - 2) 205.133.127.87
 - 3) 96.17.202.208
- b) What is the significance of the entry for 205.133.127.255

9. (7 points) You obtained the following information from a workstation:

```
C:\>ipconfig
```

```
Windows IP Configuration
```

```
Ethernet adapter El90x1:
```

```
IP Address. . . . . : 10.0.0.98
Subnet Mask . . . . . : 255.255.0.0
Default Gateway . . . : 10.0.250.254
```

You then check the arp table with the following entry:

```
C:\>arp -a
```

```
Interface: 10.0.0.98 on Interface 2
Internet Address  Physical Address  Type
10.0.250.254     00-e0-b0-ac-ac-a8  dynamic
```

Next, you execute the following command:

```
C:\>ping 10.0.255.255
```

And received the following reply:

```
Pinging 10.0.255.255 with 32 bytes of data:
```

```
Reply from 10.0.255.255: bytes=32 time<10ms TTL=255
Reply from 10.0.255.255: bytes=32 time<10ms TTL=255
Reply from 10.0.255.255: bytes=32 time<10ms TTL=255
```

Finally, you obtained the following:

```
C:\> arp -a
```

```
Interface: 10.0.0.98 on Interface 2
Internet Address  Physical Address  Type
10.0.116.21       00-00-f4-a9-9d-d4  dynamic
10.0.224.34       00-00-1d-0f-4b-71  dynamic
10.0.108.2        00-00-f4-a9-98-21  dynamic
10.0.17.129       00-00-f4-b1-b6-57  dynamic
10.0.7.141        00-10-5a-05-ef-f9  dynamic
10.0.0.153        00-60-b0-79-c3-80  dynamic
10.0.255.255     FF:FF:FF:FF:FF:FF  dynamic
10.0.1.250        00-00-0c-4e-32-90  dynamic
10.0.1.251        00-00-0c-4e-32-90  dynamic
10.0.250.254     00-e0-b0-ac-ac-a8  dynamic
```

a) How can you account for the new entries in the arp table?
