

Final

MAY 3, 1995.

There are four problems for a total of 100 points. Show all your work, partial credit will be awarded. When there is not enough room on the test page itself, write in the provided blue books and write and sign your name on each one. No notes, no collaboration.

Name: _____

| Problem | Credit |
|---------|--------|
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| Total | |

1. This is the result of `netstat -rn`:

```
Routing tables
Destination      Gateway           Flags    Refcnt  Use      Interface
127.0.0.1        127.0.0.1        UH       7        69146    lo0
default          129.171.97.100   UG       2        18260    ln0
192.31.89.0      129.171.32.5    UG       0         0        ie2
129.171.0.0      129.171.32.9    U        9       814859    ie2
192.70.171.0     192.70.171.1    U       32     649864    le0
137.78.0.0       129.171.32.4    UG       0         0        ie2
```

- (a) What is the IP address of the machine on which this was run?
- (b) What will happen to a packet bound for address 129.171.34.16?
- (c) What will happen to a packet bound for address 192.31.89.1?
- (d) What will happen to a packet bound for address 192.31.97.2?

2. This is an extract from the result of `/etc/arp -a`:

```
centrex.IR.Miami.EDU (129.171.32.4) at aa:0:4:0:5f:c  
mthvax.cs.miami.edu (129.171.32.5) at 8:0:2b:12:23:5d  
martox.rsmas.miami.edu (129.171.101.19) at aa:0:4:0:5f:c  
warsaw.cs.miami.edu (192.70.171.173) at 8:0:20:d:fa:d4  
passaic.cs.miami.edu (129.171.34.23) at 8:0:2b:2e:79:74  
ren.ir.miami.edu (129.171.32.33) at aa:0:4:0:46:c  
umigw.rsmas.miami.edu (129.171.97.1) at aa:0:4:0:5f:c
```

Is Proxy Arp at work here? Explain.

3. This is the result of `/etc/ifconfig -a`:

```
le0: flags=63<UP,BROADCAST,NOTRAILERS,RUNNING>
      inet 192.70.171.1 netmask fffffff0 broadcast 192.70.171.0
ie2: flags=63<UP,BROADCAST,NOTRAILERS,RUNNING>
      inet 129.171.32.9 netmask ffff0000 broadcast 129.171.0.0
lo0: flags=69<UP,LOOPBACK,NOTRAILERS,RUNNING>
      inet 127.0.0.1 netmask ff000000
```

- (a) Is this a client, a server, a router and/or a multihomed host? Why?
- (b) Is subnet routing being used? What class is each interface?
- (c) How is this interface non-standard? Can you guess the operating system being used here given the non-standard parameter?

4. Here is a sample traceroute:

```

ROOT#PARIS[128]#/etc/traceroute sargas.inria.fr
traceroute to sargas.inria.fr (138.96.16.9), 30 hops max, 40 byte
packets
 1 centrex.IR.Miami.EDU (129.171.32.4)  0 ms  0 ms  10 ms
 2 129.171.160.3 (129.171.160.3)  10 ms  10 ms  10 ms
 3 192.239.208.2 (192.239.208.2)  10 ms  0 ms  0 ms
 4 * * *
 5 jkv1-msb1-c1.sura.net (128.167.168.1)  20 ms  20 ms  40 ms
 6 atu2-jkv1-c3mb.sura.net (128.167.218.1)  30 ms  30 ms  30 ms
 7 cpe1-fddi1.Atlanta.mci.net (192.221.42.100)  30 ms  40 ms  30 ms
 8 border1-hssi1-0.Atlanta.mci.net (204.70.16.5)  30 ms  30 ms  30 ms
 9 core-fddi-0.Atlanta.mci.net (204.70.2.49)  30 ms  30 ms  30 ms
10 core-hssi-4.Washington.mci.net (204.70.1.9)  50 ms  50 ms  50 ms
11 border2-fddi0-0.Washington.mci.net (204.70.3.2)  50 ms  50 ms  50 ms
12 mae-east-plusplus.Washington.mci.net (204.70.57.10)  60 ms  40 ms  50 ms
13 icm-dc-1-E4/0.icp.net (192.41.177.240)  50 ms  70 ms  60 ms
14 icm-dc-1-H1/0-T3.icp.net (198.67.131.10)  80 ms  50 ms  60 ms
15 icm-dc-2b-F2/0.icp.net (198.67.131.34)  40 ms  40 ms  60 ms
16 icm-paris-1-S0-1984k.icp.net (192.157.65.130)  200 ms  200 ms  220 ms
17 Renater-RBS1.Ebone.net (192.121.156.73)  210 ms  220 ms  250 ms
18 stamand3.renater.ft.net (192.93.43.169)  170 ms  180 ms  250 ms
19 stamand1.renater.ft.net (192.93.43.18)  230 ms  230 ms  220 ms
20 * lyon1.renater.ft.net (192.93.43.89)  220 ms  260 ms
21 marseille.renater.ft.net (192.93.43.73)  260 ms  180 ms  170 ms
22 marseille1.r3t2.ft.net (192.93.43.49)  190 ms  190 ms  240 ms
23 sophia1.r3t2.ft.net (193.48.50.33)  260 ms  210 ms  180 ms
24 inria-sophia.r3t2.ft.net (193.48.50.50)  220 ms  190 ms  190 ms
25 193.48.50.170 (193.48.50.170)  170 ms  200 ms  300 ms
26 sophia-gw.inria.fr (193.51.208.1)  170 ms  200 ms  180 ms
27 t8-gw.inria.fr (138.96.64.250)  200 ms  160 ms  270 ms
28 sargas.inria.fr (138.96.16.9)  210 ms  200 ms  250 ms
ROOT#PARIS[129]#

```

- (a) What did DNS find out about sargas.inria.fr?
- (b) Where did the packet leave the University of Miami?

- (c) Exactly where did the packet go overseas? How did you reach this conclusion?
- (d) Where was the DNS reverse name lookup unsuccessful?
- (e) Considering that light travels at 1 foot per nanosecond, how far did the packet travel? Is this reasonable? What's going on?