MITP 432
Communication Networks I

Homework #1

Decimal to binary to hexadecimal conversions:

Decimal	Binary	Hexadecimal
0	0000	0
1	0001	1
2	0010	2
3	0011	3
4	0100	4
5	0101	5
6	0110	6
7	0111	7
8	1000	8
9	1001	9
10	1010	A
11	1011	B
12	1100	C
13	1101	D
14	1110	E
15	1111	F

1) [10] Complete the following table of conversions from binary to decimal.

Binary	**128**	**64**	**32**	**16**	**8**	**4**	**2**	**1**	**Decimal**
10101011	1	0	1	0	1	0	1	1	171
01011001									
00001111									
00110101									
10111010									
11010101									

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2) [10] Complete the following table of conversions from decimal to binary.

Decimal	**128**	**64**	**32**	**16**	**8**	**4**	**2**	**1**	**Binary**
171	1	0	1	0	1	0	1	1	10101011
48									
60									
222									
119									
253									

3) [10] Convert the following binary numbers to hexadecimal:

   a) 10000110

   b) 00010111

   c) 1000111100011000

   d) 0

   e) 11111111

4) [10] Convert the following hexadecimal numbers to binary:

   a) 0x11

   b) 0xfa

   c) 0x2e

   d) 0x67

   e) 0x2e67

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5) [10] Every so often a "joke" RFC is published. Go find a joke RFC and briefly describe what it is about. Think April 1st.

6) Internet Service Providers.

   a) [5] Determine the Internet Service Provider (ISP) that you use at home, or is used by your office or school.

   b) [5] How did you figure out which ISP was used?

   c) [5] What is the URL (e.g., www.company.com) of the ISP's main website?

7) Network equipment.

   a) [5] Find a piece of data network equipment in your home, office or school (note: clients don't count for this question, so no PCs, laptops, PDAs, cell phones, etc., but routers, switches, hubs, firewalls, and so on are fair game). What is its name and model number?

   b) [5] What is the purpose of this device?

   c) [5] Roughly how many people make use of this device?

8) [10] Use the ping program with the –n option to ping three Internet sites for at least a minute each.

   a) What is the IP address of each site?

   b) What was the lost rate to each site?

   c) What was the average round-trip delay to each site?

   d) Some sites don't respond to pings. Explain why you think this happens.

9) [10] Use the traceroute (tracert) program to discover routes to three Internet sites.

   a) What is the IP address of each site?

   b) How many hops did it take to reach each site?

   c) In the traceroute output some routers have domain names and IP addresses while others only have IP addresses. Explain why you think this happens.

   d) Occasionally two different invocations of the traceroute command will return different results (i.e., a different path between the source and destination hosts). Explain why you think this happens.

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