**Data Communications (CSE4060)**

**Homework #4 (Ch.18 - Ch.21)**

20161637 장호영

1) What is the size of the address space in each of the following systems?

a. A system in which each address is only 16 bits. **2^16**

b. A system in which each address is made of six hexadecimal digits. **16^6**

c. A system in which each address is made of four octal digits. **8^4**

2) Find the class of the following classful IP addresses – for example, class A,B,C,D,….:

a. 01110111 11110011 10000111 11011101 **class A**

b. 11101111 11000000 11110000 00011101 **class D**

c. 11011111 10110000 00011111 01011101 **class C**

3) Show the n leftmost bits of the following network-addresses/masks that can be used in a forwarding table.

a. 170.40.11.0/24 **10101010 00101000 00001011**

. 110.40.240.0/22 **01101110 00101000 111100**

c. 70.14.0.0./18 **01000110 00001110 00**

4) An organization is granted the block 130.56.0.0/16. The administrator wants to create 1024 subnets.

a. Find the number of addresses in each subnet.

**64**

b. Find the subnet prefix.

**16 + 10 = 26**

c. Find the first and the last address in the first subnet.

**130.56.0.1 / 130.56.0.62**

d. Find the first and the last address in the last subnet.

**130.56.255.193 / 130.56.255.254**

5) In computer science, when we encounter an algorithm, we often need to ask about the complexity of that algorithm (how many computations we need to do). To find the complexity of the distance vector’s algorithm, find the number of operations a node needs to do when it receives a vector from a neighbor.

**O(n)**

6) A multicast address for a group is 232.24.60.9. What is its 48-bit Ethernet address for a LAN using TCP/IP?

01:00:5E:18:3C:09