Assignment 4

Covered Topics: -
Network Layer (IP)

Problem 1

Complete the following table which provides practice in converting a number from binary notation to decimal format.

Binary	128	64	32	16	8	4	2	1	Decimal
11001100	1	1	0	0	1	1	0	0	128+64+8+4 = 204
10101010									
11100011									
10110011									
00110101									

Complete the following table which provides practice in converting a number from decimal notation to binary format

Decimal	128	64	32	16	8	4	2	1	Binary
48	0	0	1	1	0	0	0	0	$48=32+16=00110000_2$
222									
119									
135									
60									

Find the class of the following IP addresses:

1) 123.56.77.32
2) 200.50.7.11
3) 12.5.17.2
4) 128. 4.1.2

Find the maximum number of hosts that can be connected to the network in the following cases:

1) Class A IP address
2) Class B IP address
3) Class C IP address

Problem 3

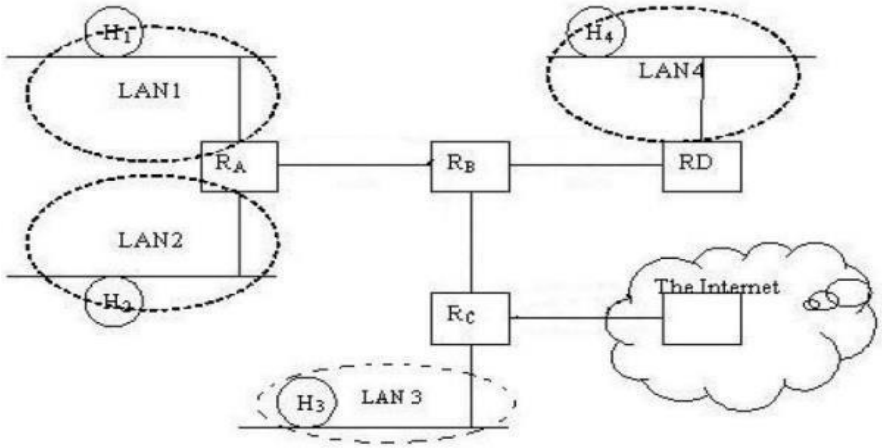
Write the following netmasks in slash (/n) notation

1) 255.255.255.0
2) 255.255.254.0

Problem 4

The following network is composed of four LANS: LAN 1, LAN 2, LAN 3, and LAN 4. The network addresses is class C network address 193.115.52.x Determine:

a. Network address for each LAN
b. The IP address for all the hosts in the figure.
c. The maximum number of hosts that can be connected to every LAN and the range of the IP addresses that can be given.



Problem 5

Assume that you have been assigned the 200.35.1.0/24 network block.

- Define an extended network prefix that allows the creation of 20 hosts on each subnet.
- What is the maximum number of hosts that can be assigned to each subnet?
- What is the maximum number of subnets that can be defined?
- Specify the subnets of 200.35.1.0/24 in binary format and dotted-decimal notation.
- List the range of host addresses that can be assigned to Subnet #6 (200.35.1.192/27)
- What is the broadcast address for subnet 200.35.1.192/27?

Problem 6

Suppose that a TCP segment that contains 2048 bytes of data plus 20 bytes of TCP header is passed to IP for delivery across 2 networks of the Internet, N1 and N2. The network N 1 uses 14 bytes of header for its data-link layer frames and has an MTU of 1024 bytes; the network N2 uses 8 bytes header with an MTU of 512 bytes. Each network's MTU gives the total packet size that may be encapsulated as data pay load in a frame, including the packet's IP header Give the sizes and offsets of the sequence of fragments delivered to the IP layer at the destination host. Assume all IP headers are 20 bytes long.

Problem 7

Suppose that a host application needs to transmit a packet of 3,500 bytes. The physical layer has an MTU of 1,500 bytes. The packet has an IP header of 20 bytes plus another attached header of 20 bytes. Fragment the packet, and specify the ID, MF, and offset field of all fragments.